INTUITION

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Intuition: BYU Undergraduate Journal of Psychology

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Intuition would especially like to thank Julianne Holt-Lunstad for his guidance in developing this journal. The efforts of Mel Thorne, Linda Hunter Adams, and the Psychology Department faculty members who generously provided reviews are likewise appreciated.

Additional information can be found on our Web site at http://intuition.byu.edu
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From the Editor

Paige N. Vella

This year's successful issue of the journal was accomplished after overcoming many obstacles. We experienced almost a complete change of staff, not to mention a change in the editor-in-chief. Consequently, the journal went through almost complete reorganization, and the new staff members had to be trained to work on the project. With the help of the old staff, the new staff, and many of the faculty, we were able to complete the project and present you with the newest issue of BYU's very own Undergraduate Journal of Psychology, *Intuition*.

I would like to thank all the staff members, both of the old staff and the new, who gave their time to work on the journal. We had some students who were able to dedicate their time to work on the journal for their capstone credit, and we had others who simply wanted the experience and donated their free time to help with the journal.

I would like to give a special thanks to McKay A. Young who started out as the editor-in-chief on the staff at the beginning of the year. He spent countless hours on the project to improve the system of reviewing articles, and tried to make working on the journal a worthwhile experience to those who were serving on the staff.

I would also like to thank the faculty who donated their time and effort to the journal. We realize that the faculty members are often very busy with their own projects and classes, and we appreciate the time that they take out of their schedules to help us out.

I especially would like to thank Dr. Julianne Holt-Lunstad who was the advisor for the journal this year. Her support and insight have helped us to improve the journal beyond what we may have been able to do ourselves. Working with her was a very enjoyable experience.

Finally, I would like to thank the authors for their efforts in the reviewing process and for their patience with the change of staff. We hope that they, as well as everyone else, enjoy this issue of *Intuition*.
**Interview with Dr. Robert D. Ridge**

McKay A. Young

**ABSTRACT** In February 2007, Dr. Robert Ridge and his colleagues published an article that sparked a great deal of controversy. The research looked into people's reactions to a Biblical account regarding aggressive provocation and retaliation. One group of participants was told that the verse was from the Bible and read that God sanctioned the aggression, whereas another group was informed that the reading was from an ancient scroll in which there was no mention of deity. In subsequent interactions with assigned partners the subjects who read that the aggression was sanctioned by God reacted more aggressively. The clamor regarding the research has shown not only the wide appeal of the research, but has also shown people's extrapolations regarding potential hidden implications that they feel may lie within the findings.

**What was your role in the study?** Though you were not the principal researcher, it seemed that a lot of the research was done here at BYU.

Brad Bushman called me and said that he had been thinking about doing this research—taking a look at this issue about how people would respond if they read a scriptural account of violent provocation. He told me that he would really like to do this type of study, but that he would need to collaborate with somebody because it would ideally be done at some place where you have a religious audience. Dr. Bushman is in the aggression arena, and because he is the known expert in the field, I was working as the junior collaborator, with him as the principal investigator. It would be like working in his lab, the difference being that we really were equal in terms of creating the study and doing it. But, because he invited me and it was his initial idea, he was the principal investigator.

**How did Dr. Bushman find you and get in contact with you?**

I've known Dr. Bushman for fifteen years. He was doing really good work, so I invited him to come here and give a forum for the department, and that would have been somewhere in the early to mid 1990's. We would see each other at conferences, and he is such a great scholar and a really nice guy. We would occasionally see each other and stay in contact, but this is the first time that we've ever decided to do something together.

**What role did the graduate students play in the study?**

When I first started talking with Dr. Bushman it was clear that to do the research I would want to have students working on it as well; you can't really do any research without student support. They are students whose thesis and dissertations I chaired or am chairing, so I told them about the research and asked them if they were interested and wanted to be involved. Both Colin Key and Greg Busath said that they were interested. It was not a hard sell. It was at my invitation partially because I thought they might be interested and partly because as a faculty you feel a responsibility to help students get involved in research and this was a great opportunity.

**Were they involved in the administration of the study, or did they work more with statistics?**

They actually had a unique opportunity to be involved even in the conceptualization of the study. When Dr. Bushman and I talked about it we just had a general outline and idea. We would have people read a scriptural account, violent provocation followed with retaliation, and we would measure people's cognitive, behavioral, and affective responses. In talking about it we knew we wanted to manipulate whether they read about it from a scriptural source or from a secular source. And then in our discussions we also wanted to know what would happen if God authorized it or didn't authorize it, or some sort or sanction from deity. So, when it came to deciding what would actually happen that's where I sat down with Colin and Greg and said, "Ok, let's come up with a study: this is the basic outline." Dr. Bushman had used cognitive, behavioral and affective measures before so we...
got the behavioral weapon from him (the noise weapon), and we came up with the idea to do the research online on computer terminals. We as a group came up with the details, so they got to be involved in not only designing it, but also pilot testing it and running it. They got to recruit, run subjects, run and analyze the data; they got to do it all.

The research has been given a lot of media coverage, what do you think of all the media coverage that it has received?

Well, at one level it is nice to do research that people care about and are interested in. The interest was immediate. This was a journal that has some impact—people read it and refer to it a lot in other studies. It is not just for a particular sub-discipline of psychology but for the entire field. They also like to issue press-releases when they get research that they think will be of interest to the public, so they issued a press-release related to this research. The people in the media saw that release and started contacting us with inquiries. So at that level it was good, because there was a lot of interest. But, when you get interest like that, you are going to get some media outlets that rely solely on the press release, which is designed to be a little splashy. While it is technically accurate, they made it seem a little more sexy than it was, and both media and people respond to that. The downside is people might react to what they think the research is about and what it is not, so they might have some controversial statements from that. We always responded respectfully to any inquiries. I never personally got any emails that were complaints, but I heard about those emails. But we always encouraged people to read the article and to pay particular attention to the implications of the research, what it did and did not tell us. It is not really complicated—you don't need a Ph.D. to understand it.

How has the LDS community itself responded, since the majority of the research was done here within the LDS community at BYU?

That's a good question. I know that the Deseret News was calling the University and me for comment the day after the press release. And I talked with them and explained what the research suggested and what the limitations were, and what you could infer from it. I tried to help them understand it. As far as readers go in Utah, predominantly LDS, I never saw a letter-to-the editor or anything like that. Most people who I talked with, after I explained what the research was about, why we had done it, and how we had done it, thought that it was interesting. Most of them had follow-up questions: “That is really interesting. Now, what would happen if it were a little different?” To me, that meant they were interested in probing the limitations of that finding. Our follow-up research we are doing now is addressing some of those very questions. I didn't get any sense from the LDS community that there was anything other than interest. But I do know that there are those that are concerned. Those that didn't read it or understand it might come away with the notion that Mormons are a violent people, and I could see how they would be worried about that.

One of the responses we see to your research is the idea that religion makes people aggressive, how would you respond to that idea?

I think that if one is familiar with the research what you find is that people who are less grounded in their religion are more vulnerable to these types of influences. The research shows that people who are more devout and more mature are typically less prejudiced and less aggressive. The problem is that people will see acts of aggression attributed to religious causes, so they assume that religion must be the origin of these aggressive actions. An immature understanding of religious doctrines could be used by a person to justify aggression. People who understand the contexts within which these things have been written, the lessons trying to be taught from these accounts, understand that ultimately the message is not one of violence and aggression and hate, it's one of acceptance and love and harmony. So what I try to tell people is that yes, there are people that say they are religious and will justify violent actions for religious reasons, but you'll find people who are more in the mainstream of that religion that will say those people are outliers—they don't get it, they don't understand it. If they did they wouldn't be doing that stuff. The literature on prejudice shows that the people who are more devout are less prejudiced than those who are less devout, but they both say they are religious. Similarly, for example within the LDS church one would
think that more education would be more likely to make one too intellectual and they would start to question and leave the church. But within the church we find that the higher the level of education, the more active people are. So I think we see superficial religiosity associated with aggression and a variety of societal ills, whereas a deeper understanding of religious theology I think is associated with things we aspire to: be kind, loving, accepting—forgiving. So I think you ought to recognize that there is a range of religiosity. And I think at the end you're going to see those problems when people are superficial and are less-mature.

In the research you used the American Bible, opposed to the King James. What was the reason for that?

We were going to be telling people that this was either a translation from a scroll or something that is biblical. They had to be the same. If we had made the scroll the exact same as the King James Version of the Bible, we thought no one would buy that. We wanted something that didn't sound like it was from 2008, but we didn't want it to sound Old English like the King James Version. So we thought, "If we use the American Bible people wouldn't recognize it from familiar biblical speech." We wanted it in the middle so it would sound like a translation as if someone were translating a scroll. At the same time, for the Biblical account, we told them that it came from that version of the Bible. That enabled us to use the exact same text in both conditions but not bias it so it obviously didn't look right in the scroll condition. And plus, I don't know if this is good or bad, nearly every person who participated did not recognize the story. Now, admittedly, it's embedded in Judges 19-21. It's a pretty brutal story.

Where are you planning to take the research next?

We are collecting data right now where we have two different versions of a story where there is violent provocation—it is the same one as in this original story. The difference is that we are looking at whether a soft answer really does turn away wrath. In other words we want to know if What we are asking is: will changing the ending of the scriptural story used previously to a new ending, one that shows peaceful reconciliation, be associated with lowered levels of anger and aggression? If it turns out as we anticipate—"a soft answer turneth away wrath"—that people respond less aggressively when they get this reconciliation story, does that also correspond with greater pro-social behavior? And we have some measures of pro-social behavior we can employ in the study. So there will really be two findings that we will look at: does aggression, whose final lesson is forgiveness and reconciliation, reduce subsequent aggression in the reader, and does that also increase pro-social behavior? It's a two-stage sort of thing.

What do you hope people will take from this study?

One overall message—if you expose yourself to violent media it can affect you. Now, it can affect different people different ways, but this study is consistent with a large body of research that exposure to violent media can make people more aggressive. People may feel like they are invulnerable, they may feel that they are above that or it doesn't affect them like it does everybody else. But, study after study shows that exposure to violent media can make people more aggressive. This study shows yet another medium that is consistent with the body of research. In addition, they could also take from it that if you are exposed to violent media that makes the violence appear to be justified or sanctioned by what you consider brutal. So we thought, we wanted it to sound like a translation from a scroll or something that is biblical. That enabled us to use the exact same text in both conditions but not bias it so it obviously didn't look right in the scroll condition. And plus, I don't know if this is good or bad, nearly every person who participated did not recognize the story. Now, admittedly, it's embedded in Judges 19-21. It's a pretty brutal story.
context will understand that there were important, higher objectives that need to be met. So the bottom line is, if people understand context, if they understand the overall message then they're not at any great risk at being more violent or aggressive people.

The Intuition Staff thanks Dr. Ridge for his time, support, and willingness to make this interview possible.
Comparison of Spoken and Signed Languages and Their Neural Pathways

Michelle Z. Gammill

ABSTRACT  Past literature shows that the brain regions involved in the understanding and production of verbal languages are the same brain regions that allow one to communicate in sign language. Brain lesion studies have confirmed that both spoken and signed language rely on a common system of neural and cognitive mechanisms. Further research has confirmed that by acquiring sign language skills at a young age, children have the advantage of enhanced cognitive processes pertaining to language, spatial reasoning, and attention. Future research could be conducted regarding the advantages that sign language acquired early in life could have on minimizing both the learning and attention disabilities in hearing and deaf children.

Language is a critical component of survival and success for the human race. Using language allows people to express their ideas, thoughts, and feelings. Language gave people the opportunity to organize into societies and to learn from surrounding cultures in order to progress intellectually and socially. Research comparing dissimilar languages leads to insights concerning how the brain processes language and how acquiring a different language could be advantageous to cognitive development (Cattani, & Clibbens, 2005).

Sign language is composed of manual hand movements and facial expressions that convey thoughts, emotions, ideas, and information. Sign language has been in use by deaf individuals for centuries, and researchers today have proposed that the use of manual language preceded the development of proper written and spoken language (Lane, p. 45). Sign language is not manual English but is instead a language consisting of its own specific rules for grammar and structure. Sign language is often considered inefficient or incomplete by those who are unaware of its utility, but it allows the deaf community to enjoy a culture of rich language and communication comparable to that of the hearing community.

Examining the use of sign language by deaf and hearing people provides information about how our brains react in both different and similar ways when using sign language versus spoken language. Comparing the two types of language reveals which brain systems and functions are used to maintain the capacity to speak or sign. It will also clarify which systems are used to understand, define, and remember information within each language. When comparing neural activity in subjects communicating with either signs or verbal speech, the brain pathways and regions that are used to produce, comprehend, and analyze language have been found to be the same (Hickok, Bellugi, & Kilma, 2002). Although these similarities confirm that one language is not superior to the other in regards to communication abilities, it has been found that sign language has the power to enhance specific cognitive functions, especially in young children. These cognitive functions include attention, visual discrimination, and spatial abilities (Cattani, & Clibbens, 2005).

Brain Regions Involved in Language

Our ability to produce and understand language lies in many different areas of the brain. To effectively compare the neural pathways of spoken and signed languages, it is necessary to be familiar with the basic brain regions that are found to have considerable involvement in the production of language. The left hemisphere of the brain is strongly involved in the functions of language. This system involves Broca's area and Wernicke's area connected by the arcuate fasciculus.

Broca's area is found in the left frontal-temporal lobe. It is involved in speech production and coordinating movements of the mouth and surrounding areas. This area holds the information a person needs in order to physically produce words in a comprehensible manner.
and to combine words together into phrases and sentences. Although this area of the brain is considered to contain the 'motor memory' of speech, damage to it can produce many debilitating effects. Broca's aphasia causes deficits such as agrammatism, anomia and difficulties with the articulation and pronunciation of words (Harrison’s Manual of Medicine; Carlson, p. 396-398).

Wernicke's area is found in the left-temporal lobe of the auditory association cortex. This area is specifically involved in the understanding of speech, including speech perception and memories of particular sounds. Those who suffer from Wernicke's aphasia are able to hear speech, but they do not recognize or comprehend the words which are being spoken. This phenomenon is called pure word deafness. Though the speech of those who suffer from it may not be impaired, sufferers have great difficulty communicating because they do not understand what others are saying to them (Harrison’s Manual of Medicine; Carlson, p. 399-400). This deficit has been found to involve mirror neurons which give important feedback about muscular, physical, and spatial movements. These include even very subtle movements that facilitate language production and aid individuals in understanding speech through visual cues.

**Neurological Involvement in Sign Language**

**Hemispheric Lateralization**

It has been found that the left hemisphere of the brain and the important brain regions that are involved in producing spoken language have the same amount of involvement in producing sign language. These areas of the brain, and their ability to perform their specific functions, develop independently of the persons' ability to hear. Thus, these areas are equally involved in language production for both deaf and hearing people. For example, Hickok, et al. (2002) made surprising discoveries in which damage to specific regions of Broca's area and Wernicke's area had comparable impacts on the ability of both signers and speaking individuals to produce comprehensible language. Those with damage to Broca's area had deficits in the production of the signs necessary to convey their thoughts, while those with Wernicke's area damage had difficulties in understanding and comprehending others' signs. Because of the dually important role of being able to produce and understand the different languages, information regarding the relationship between these two processes now allows analysis of how these areas develop in deaf and hearing people independent of their ability to hear. The independent development of these areas and their involvement in language shows that they are still in use in the brains of deaf people, just as they are in hearing people. The brain will be organized comparatively regardless of the way one produces and understands language (Hickok, et al., 2002). The ability to use language develops laterally in the left hemisphere in both speakers and signers, yet it has been found that sign language also incorporates the right hemisphere in a specialized way during production and comprehension of language.

Sign language does involve the right hemisphere to a larger extent than spoken language for spatial analysis and reasoning. Spatial analysis is one's ability to comprehend the relation of the physical aspects of signing and its relation to space, as well as the signs relations to one another. The ability to analyze spatial difference is important for signers in order to detect changes in the meanings of words. It was found by Bellugi, Kilma, and Poizner (1988) that damage to the left hemisphere of signers showed problems in the ability to produce and understand signs, but it did not affect their ability to effectively analyze visuo-spatial information involved in sign language. The opposite was found for signers who had damage to the right cerebral hemisphere. These signers showed deficits in spatial analysis but not in their ability to produce or understand signs. Because there is more cognitive involvement through the visuo-spatial analysis of sign language, the two cerebral hemispheres serve as compliments to one another in order to effectively monitor visuo-spatial aspects as well as to produce and comprehend sign language.

**The Mirror Neuron System**

Another important aspect of language has been found to be used in spoken and especially in sign language. The mirror neuron system of language, found primarily in Broca's area, is activated by major hand movements (as in sign language) and also by subtle muscular movements of the face during speech production (Carlson, pg. 408; Rizzolatti et al., 2004). Rizzolatti, and Craighero (2004) found that the mirror neuron system gives primates the ability to learn and understand through imitation. These
neurons are activated both when performing a physical movement and when watching another individual making movement involved in speech production or body language. Because of the brain's vast involvement in all types of movement and comprehension, the mirror neuron system is found all throughout the brain and so makes lesion studies very difficult. Therefore, an experiment was done by Umilt'a, Kohler, Gallese, Fogassi, and Fadiga (as cited in Rizzolatti, & Craighero, 2004) in order to test the efficacy of the mirror neuron system in analyzing others' physical actions. The experimenters presented two visual tasks for monkeys as their mirror neuron systems were monitored. The first task gave the monkeys a full visual field where the experimenter reached for a piece of food. The second restricted the monkeys' visual field as the experimenter reached for a piece of food hidden behind a screen. In both trials, the mirror neuron system was activated in both the hidden and full-view conditions. This illustrates that the mirror neuron system is involved in action understanding even when there are merely physical cues about what is happening in the environment.

The mirror neuron system gives humans, primates and other animals the astounding ability to imitate actions with ease. The mirror neurons pick up visual cues performed by others and translate them into independently performed actions. During speech language acquisition, subtle facial cues, which are informative about how specific sounds are produced, play a major role in the development of speech abilities. In sign language acquisition, the mirror neuron system plays an even bigger role because of the nature of larger physical hand, arm, body, and facial movements involved in signing and expressing ideas physically. The mirror neuron system is activated by these physical movements and allows individuals to understand the physical aspect of language production. Therefore, this system plays a significant role in the acquisition of both speech and sign language.

Sign language and speech production consistently use the same brain pathways and systems in order to produce and understand language. The involvement of Broca's area, as well as Wernicke's area, and the influences of the mirror neuron system in both sign language and speech, signifies both major overlap in brain functioning and that the brain comprehends the drastically different languages in very similar ways. Willems and Hagoort (2007) also reviewed research confirming that these systems are used in both speech and sign production. Furthermore, communicating with sign language involves other brain regions such as the parietal cortex and the right cerebral hemisphere to enhance spatial analysis. Looking at a different field of research that involves brain injuries and lesions provides additional evidence that both modalities of language use similar brain systems.

Brain Lesion and fMRI Studies: Sign Language and Speech Share Brain Regions

Peperkamp and Mehler (1999) cited multiple studies that had been done by researchers involving deaf individuals with brain damage or cerebral lesions. Hickok, Bellugi, and Kilma (2002) studied native signers who had experienced brain trauma or lesions to the left hemisphere. They displayed aphasic type problems while producing sign language, unlike individuals with right hemisphere damage (as cited in Peperkamp, & Mehler, 1999). Those with left hemispheric damage consistently displayed language problems regardless of their ability to hear or their preferred method of language. Cerebral damage to the left hemisphere showed similar deficits in hearing and deaf individuals, emphasizing that the Wernicke's and Broca's pathways are involved in both speech and sign production.

An experiment performed by Buchsbaum, Pickell, and Love (2005) examined working memory in deaf individuals perceiving and producing signs. Sets of three nonsense signs were presented to the participants and they were then asked to reproduce the signs covertly. During the covert production of the viewed signs, the left hemisphere showed substantial involvement. Because of the left hemisphere's involvement in language and production, this finding is consistent with language produced verbally. Yet, during the viewing and perceiving period of the nonsense signs, fMRI scans showed bilateral brain involvement in both the temporal and parietal lobes (posterior STS, and posterior parietal cortex). This is unique to deaf and signing people. It suggests modality-specific effects in working memory for perception and production of language. However, the similarity between languages (frontal lobe involvement and left hemisphere dominance) suggests a modality-independent system of
working memory. These findings point to plasticity, a theory which is the idea that speech-related processes that are not in use by those who are deaf are compensated for and devoted to sign-related processes. This accounts for the differences in cerebral involvement in language perception. Although the auditory input is absent, cerebral involvement for other purposes relating to sign language encourages cognitive enhancements not experienced by hearing and speaking individuals.

The Power of Sign: Enhancing Brain Development and Cognitive Functions

Although sign language and speech use the same brain pathways and regions to understand and produce language, the plasticity involved in sign language acquisition and the involvement of many other cognitive abilities allows the speculation that sign language can enhance cognitive functions in both hearing and deaf individuals. According to this hypothesis, the acquisition of sign language, especially at an early age, will incorporate the use of brain areas involved in attention and visuo-spatial abilities and will allow for cognitive enhancements during critical language and developmental periods.

It has been found that motor and language development are closely related and that motor developments are most often made before that of significant language developments (Bonvillian, Orlansky & Novack, 1983). This is consistent with the frequent finding that even if a child is hearing, it would be expected that developments in visuo-motor abilities, such as gesturing or signing, would be made before vocal expressions of language (Marshcark, 1997, p. 93). In fact, it was found by Bonvillian, Orlansky, and Novack (1983) that children of deaf parents produced recognizable signs 2-3 months earlier than a child would be expected to speak their first word. This early acquisition, along with the aforementioned right hemispheric involvement for sign language comprehension and spatial analysis, has been found to have an enhancing influence on several aspects of learning and memory.

It has been suggested that those who use sign language still have the dominating language functions found in the left hemisphere and that the right hemisphere is also involved in their mode of communication. Cattani, Clibbens, and Perfect (2007) used mixed groups of hearing and deaf participants—both signing and non-signing—to analyze their ability to remember and discriminate between abstract shapes and well known objects. The pictures were alternatively presented to either the right visual field or the left visual field. The results revealed that the deaf individuals had better memory for the abstract shapes than did the hearing individuals. Their ability to remember the well-known objects were equivalent, yet the hemispheric domination differed. For deaf individuals, lateralization was found in the right hemisphere whereas the hearing individuals lateralized in the left hemisphere. Deaf individuals consistently incorporated the right hemisphere for analysis and memory of visual information as well as the incorporation of the left hemisphere for comprehension and production of language.

Cattani and Clibbens (2005) also found that when presented with a visual stimulus the ability to remember its previous location was superior in deaf signers. The individuals were presented with a visual stimulus of a circle on a black screen twice consecutively. The participants were then asked to determine if the stimulus was presented in either the same or different location. The deaf signers were consistently faster at recognizing differences in location and also showed right hemisphere domination when analyzing the categorical information. The hearing individuals again showed left hemisphere domination. Thus Cattani et al. (2005) confirms that sign language uses the right hemisphere as a compliment to the left hemisphere for visual discrimination and memory of visual stimuli.

Capirci, Cattani, Rossini, and Volterra (2000) found that sign language also enhances cognition in children who are not deaf. Capirci et al. (2000) conducted two experiments involving first and second grade children. The first experiment was a longitudinal study, including two independent groups. The first group consisted of hearing children taking a sign language class during the year (specifically Italian sign language, or LIS), and a control group consisted of hearing children not participating in any sign language classes. The Raven PM 47 test was administered at the beginning and end of the year to track cognitive abilities. The first sets of test scores between the two groups were comparable, but by the end of the year the students who had been learning LIS performed significantly better than their peers on visual discrimination and spatial memory tasks. Thus, incorporating sign lan-
Future Research

Considering the research that has been done, a longitudinal study spanning twenty or more years would be beneficial to further understand the systems of language comprehension and production between different languages. An examination of the cognitive processes that are involved could also lead to insights about how different modes of language use similar systems within the brain. This could be done through a longitudinal study used to assess brain development in relation to what areas are dominant in language acquisition independent of sound involvement. A study like this, using both deaf and hearing children who are learning either sign language or speech, would facilitate research on this topic.

The information that sign language enhances cognitive development in children and that of which brain areas are involved in both speech and sign, paves the way for future research. The uniqueness of a lengthened longitudinal study would add to the research on this topic because it has never been examined before and it would give insight to cognitive developments occurring later in life. Further research has the potential to discover the benefits sign language would have in enhancing cognitive functions pertaining to language. Other possible effects of sign language could be discovered in decreasing learning disabilities and attention deficits of early childhood. It has been discussed that sign language can enhance cognitive skills such as attention and spatial abilities, and perhaps the acquisition of sign language in early years could minimize a child's susceptibility to develop attention and learning disabilities.

References


Dress For the Job You Want: An Examination of the Relationship Between Work Attire and Perceived Level of Education

Emily Johnston, Stacie Jackson, and Meredith Kelley

ABSTRACT The purpose of this study is to examine the relationship between formality of dress and perceived level of education. This association is important for work environments, especially with trends moving towards more casual dress codes. One hundred and fifty-five participants were shown a picture of a man in eight different outfits of varying formality. Participants were asked to indicate the highest level of education they believed he had achieved. Education levels were measured using the Simon Scale of Educational Achievement. A Spearman correlation was used to calculate the strength of the relationship between the variables. A significant positive correlation was found. Therefore, we conclude that individuals dressed in more formal attire are perceived to have a higher level of education.

Throughout the 1990s, work attire became progressively less formal, and for the most part has remained that way (Yates & Jones, 1998). From 1992 to 1995 the number of American workplaces offering employees a casual dress day jumped 24 percent, rising to an astounding 97 percent by the year 2000 (Yates & Jones, 1998; Kaplan-Lieserson, 2000). These changes are important because research shows that the formality of attire is a significant factor in impression formation (Kwon & Johnson-Hillery, 1998; St-James, de Man, & Stout, 2006). Specifically, studies have determined that a more formal style of dress contributes to a higher association with qualities such as expertise, credibility, and professionalism (Kwon & Johnson-Hillery, 1998; Sebastian & Bristow, 2008; Adomaitis & Johnson, 2005).

Kwon and Johnson-Hillery (1998) had business students evaluate an individual on 14 positive professional qualities - 10 social attributes and four occupational attributes - based on the formality of the person's attire (formal, semi-formal, or informal). They concluded that participants were more likely to "strongly agree" that an individual possessed the positive occupational attributes (authoritative, credible, businesslike, and responsible) if the individual was dressed in formal attire.

Ten years after Kwon and Johnson-Hillery's research, Sebastian and Bristow (2008) confirmed their evidence. Sebastian and Bristow's study had business students rank professors on credibility, trustworthiness, likability, and attractiveness based on the professor's style of dress (formal or informal) and the delivery of the professor's message (formal or informal). Results suggested that students found professors dressed in formal attire to be less likeable and more credible overall, while results for trustworthiness were dependent upon the delivery style of the message and results for attractiveness were not statistically significant.

Although other studies (Kwon & Johnson-Hillery, 1998; Morris, 2005) have evaluated the association between attire and various individual characteristics, such as self-discipline, job performance, and occupational attributes, the relationship between work attire and perceived education level has not been examined. In this study, perceived level of education was selected because educational level is a significant factor in the development of respect for individuals (Pusateri & Latane, 1982). Pusateri and Latane found that the level of education was a better predictor of respect than age. By selecting education as a variable to examine, it is expected that an association can be drawn between formality of work attire and respect. Furthermore, formality was selected because research has indicated that formality of dress is one of the most utilized cues in perception formation (Mast & Hall, 2004).

The association between perceived level of education and formality of dress may be a determinant in situations where a short, initial first impression is a factor in the future attention an individual receives. These situations may include the initial interactions between a potential employee and employer at a job fair, or a person delivering a persuasive argument, among others. The results of this study will be of particular interest to students apply-
ing for internships and jobs, or employers determining dress codes for their companies.

Research by Adomaitis and Johnson (2006) indicates that the results of this research may have significant implications for company dress codes. Their study of the evolving dress codes for flight attendants indicated that participants felt more confident and capable of fulfilling their duties when they were dressed more formally. This research may therefore indicate that dress codes instigating formality may increase employee confidence and efficiency. Research by Peluchette and Karl (2007) also indicates that formal attire causes individuals to perceive themselves as more authoritative, trustworthy and competent.

The present study asks respondents to indicate a perceived level of education for an individual dressed in apparel of varying formalities. For the purpose of this study, work attire is operationally defined as clothing, consisting of pants, shirt, and jacket, including tie (if applicable), socks, shoes and belt, but no other accessories, that are most commonly worn to work for a variety of professions. To measure the perception of education, the Simon Scale of Educational Achievement was used, which ranks eleven levels of educational achievement common within the United States.

As trends move toward more casual clothing in the workplace, this study seeks to investigate a relationship between two factors inherent in the occupational sphere. Therefore, this study seeks to examine attire and education as established elements of any workplace and therefore investigates whether these factors have any correlation. The results of this study may provide important information in determining whether the trend has changed the traditional associations between formal attire and positive attributions (Kwon & Johnson-Hillery, 1998; Adomaitis & Johnson, 2005). We hypothesize that formality of work attire and the perceived level of education will be positively correlated.

**Methods**

**Participants**

One hundred fifty-five participants evaluated eight photographs of the same male individual in various forms of work attire. Of all respondents, 69 percent were female and the average age was 22.9. Sixty-two percent of individuals completed at least some college including 11 freshmen, 16 sophomores, 45 juniors, 30 seniors, and 7 graduate students.

**Design Type and Rationale**

The independent variable was the formality of the attire worn in each photograph. The dependent variable was the perception of education level selected by the participant that he or she felt best corresponded with each picture provided. A repeated measures experimental design was used to determine the effect of formality of dress on perceived level of education. The repeated measures design was selected so that each participant could be tested on every level of the independent variable.

**Description of the Measure**

The formality of clothing was measured using the Formality of Dress Scale (FDS). It was created for this study in order to rank the specific outfits depicted in the questionnaire. As seen in Figure 1, The FDS is an ordinal scale, which assigns ascending numerical values to each outfit, with anchors of 1 (least formal) to 8 (most formal).

A male individual was photographed in each of the eight experimental outfits - one picture for each level of formality (see Figure 1). Participants were shown the photographs one at a time, in a randomly determined order.

**Figure 1. Photographs of male individual in increasingly formal attire.**
Dress For the Job You Want

Test Administration

In order to efficiently administer the test, the measure was created using Qualtrics, an online survey instrument that allows users to create electronic surveys for easy distribution. The online survey was administered through BYU’s online research management system, SONA Systems, to participants recruited through e-mail, professors, and social networking sites. Participants first responded to demographic questions concerning age, gender, and highest educational level completed. Next, participants viewed eight photographs of an individual in work attire of varying formality (see Figure 1). Images were presented one at a time, in random order. Each photograph had the entire head and face of the individual blurred until unrecognizable, in order to control for confounding variables, such as attractiveness, hairstyle, or age. The background was removed in order to control for environmental cues. While being shown each picture, participants were asked to indicate the level of education they thought corresponded with the individual in the photograph.

Statistical Procedure

A Spearman correlation coefficient was used to measure the strength and direction of the relationship between the formality of dress and perceived level of education. A Spearman correlation was selected because it is used to statistically measure associations between ordinal scale variables, which were used in this study. Relationships were also assessed between descriptive statistics (personal level of education achieved and age) and participant response.

Results

A Spearman correlation was computed to determine the strength of the relationship between the formality of attire and the level of education indicated for each image. A significant correlation was found ($r(1229) = .68$, $p < 0.001$), demonstrating a positive relationship between the formality of work attire and perceived level of education. The style associated with the highest average perceived level of education was Style 8, which was the most formal ($M_{Style 8}=8.91$, $SD=0.97$). The style associated with the lowest average level of education was Style 1,
which was the least formal (MStyle 1 = 4.12, SD=1.70). Table 1 provides descriptive statistics for each condition.

<table>
<thead>
<tr>
<th>Style of Dress</th>
<th>Mean</th>
<th>Mode</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style 1</td>
<td>4.12</td>
<td>4</td>
<td>1.70</td>
</tr>
<tr>
<td>Style 2</td>
<td>4.99</td>
<td>4</td>
<td>1.52</td>
</tr>
<tr>
<td>Style 3</td>
<td>4.55</td>
<td>4</td>
<td>1.55</td>
</tr>
<tr>
<td>Style 4</td>
<td>5.27</td>
<td>6</td>
<td>1.42</td>
</tr>
<tr>
<td>Style 5</td>
<td>5.39</td>
<td>6</td>
<td>1.52</td>
</tr>
<tr>
<td>Style 6</td>
<td>5.83</td>
<td>6</td>
<td>1.37</td>
</tr>
<tr>
<td>Style 7</td>
<td>8.05</td>
<td>8</td>
<td>0.95</td>
</tr>
<tr>
<td>Style 8</td>
<td>8.91</td>
<td>9</td>
<td>0.97</td>
</tr>
</tbody>
</table>

*Note. Styles are listed in order from least formal to most formal. Mean values are the mean response as reported on a 10-point scale of educational achievement.*

*Standard deviation*

Additionally, a negative correlation was found between the formality of clothing and the standard deviation of the responses for perceived level of education ($r(7) = -0.89$, $p < .003$), indicating that as the attire became more formal there was less variation in the answers of the respondents.

Figure 4 illustrates the decrease in standard deviation of response as the level of formality increases.

There was no significant association between the participant's age or personal level of education and the average level of education the participant indicated for the individual pictured in the questionnaire (age: $r = 0.11$, $p > .05$; personal level of education: $r = 0.14$, $p > .05$).

**Discussion**

As predicted, the results of this study indicate that there is a positive correlation between formality of dress and perceived education level. The strength of the correlation indicates that formality of dress and perceived levels of education are relatively indivisible. The results may be strong because perceptual cues automatically trigger strong attributions and perceptions. The positive curve of the correlation indicates that attire high in formality is not very likely to be related with perceptions of low educational levels. This may be due to the attributions individuals give to certain professions in which high education is necessary. One typically does not expect a CEO to be wearing shorts and a t-shirt or a fast food worker to be wearing a suit and tie. This study did not look for educational attributions to particular careers, but the results indicate that if the workplace, whatever it may be, does not require high formality in attire, it is perceived that the same work must not require high levels of educational achievement.

Recognizing that current trends lean towards more casual attire in professional workplaces, our findings may demonstrate why this trend could have negative implications (Yates & Jones, 1998; Adomaitis & Johnson, 2005). Specifically, because formality of dress is positively correlated with perceived education level, casual dress may lead employees to appear less educated. According the results of this study, by dressing in more formal work attire, individuals portray higher levels of educational achievement, which may be influential in client decision-making processes.

In addition to dress codes, these results indicate that an interviewee should choose more formal attire in order to portray a higher level of education. In job interviews, despite the fact that potential employers are provided
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with more information about an applicant than his or her appearance may imply, employers may often judge applicants on their appearance. Research shows that attire is an important aspect in the formation of perceptual cues (St-James, de Man, Stout, 2006).

Politicians or others may wish to dress in more formal attire when trying to persuade the public. Previous research indicates that there is an association between higher education and respect (Pusateri & Latané, 1982). Because our results indicate formal attire is associated with higher levels of education, politicians could dress more formally to elicit respect from the public.

The results of this study do not indicate that there is a significant association between a participant's level of education or age and the perceived level of education the participant attributed to the photographs. This may indicate that the participants did not perceive varying levels of education based on their own experiences, but on schemas built from some other source. This unknown source may be a point of research for future studies.

Interestingly, the results do indicate that as formality of dress increases, variation of perceptions decreases. The results show that individuals, no matter their own education level or age, are more inclined to associate high formality with high academic achievement than low formality with low academic achievement. These findings may indicate that individuals are more likely to make strong attributions about the academic requirements for professions that entail formal dress codes than for professions that permit informal dress codes.

Limitations

There are some limitations in regards to generalizing the results of our study. First, only males were used in the photographs provided for participants, limiting our conclusions to only male apparel. Furthermore, due to the distribution of the survey online, participants may have confused work attire for daily or "street" attire if the instructions were not read carefully. The decision to distribute the questionnaire online was made in order to reach a diverse population, however 66 percent of participants were currently enrolled in their undergraduate education. Assuming that these participants are not currently employed in the professional workforce, this study may be more applicable to business professionals if the sample consisted of business professionals as opposed to undergraduate students.

Indications for Future Research

This study may have important implications for future research regarding gender, targeted populations, alternate visual cues, and improved efficiency of distribution. Other researchers may consider focusing on correlations between female apparel and perceived educational levels because the results of this study found a significant correlation based on male apparel. Furthermore, in order to generalize to a different population, researchers could study business professionals seeking to improve their dress code policies. Extended research may potentially investigate how perceptions of education, based on formality of attire, may specifically influence hiring decisions in a business environment. For some career settings, perceptions of the level of education may be substituted for perceptions of the level of experience.

This study sought to control for confounding variables, such as attractiveness, ethnicity, race, age, and environmental cues. However, these variables may confirm the importance of other visual cues on perceptions of educational achievement and perhaps refine which exact visual cues have significance. The findings of this study have important implications for any research investigating the relationship between visual cues and perception, particularly in regard to studies primarily interested in attire and perceived levels of academic achievement.

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References


Love Unveiled: Teenage Love Within the Context of Sternberg’s Triangular Theory of Love

Stephanie Deverich

ABSTRACT: Can adolescents fall in love? Robert Sternberg’s triangular theory considers three relevant aspects of a consummate loving relationship: intimacy, passion, and commitment. Adolescents seem to fulfill some forms of intimacy, easily maintain passion, and lack adult commitment. Due to their inconsistencies in fulfilling Sternberg’s viewed loving components, this paper suggests that adolescents are not capable of being consummately in love.

In the sweet but tragic story of Romeo and Juliet, two teenagers kill themselves in an attempt to be with their true love. This story is timidly echoed in modern times when adolescents defy their parents and run away in order to stay with the one they love. Is it even possible for adolescents to truly be in love? Could Romeo and Juliet have shared true love, or were their feelings merely an expression of their adolescent emotions?

Using the construct of Robert Sternberg’s modern empirical analysis—the Triangular Theory of Love—this paper will analyze whether or not an adolescent can truly declare themselves to be “in love” (Sternberg, 1986). Sternberg’s theory has been validated through multiple studies and is considered a successful measuring stick in quantifying and qualifying love (Chandler, B. 1995; Lemieux et al., 1999; Lemieux et al. 2000; Sternberg, 1997). The Triangular Theory has also been validated as a useful scale in measuring adolescent love, finding a positive correlation between componential (intimacy, passion, and commitment) stability and establishing relationship satisfaction and duration (Overbeek, 2007). Although Overbeek’s study seems to confirm the ability of adolescents to love, it only shows that fulfilling the Triangular Theory of Love’s three components is correlated with relational satisfaction. This fulfillment may not happen in the majority of adolescents. This paper, rather than studying outcomes of component fulfillment, will consider adolescent ability (or inability rather) to fulfill the needs of the Triangular Theory.

The Triangular Theory Within the Context of Adolescent Love

Rather than viewing love as a pure emotion that constantly changes, Sternberg develops his Triangular Theory believing love develops and stabilizes throughout ones relationship. This stabilization occurs with the fulfillment of three components: intimacy, passion, and commitment. He uses the three vertices of a triangle as placement for these components. Consummate love is Sternberg’s term for an equal combination of commitment, intimacy and passion. It forms the “kind of love toward which many of us strive, especially in romantic relationships” (Sternberg, 1986, p. 124). According to this theory, a person, in this case an adolescent, can only experience a true love if his or her relationship maintains balance of intimacy, passion, and commitment. With unequal balance or missing components, an adolescent does not fulfill the components for consummate love, rather he or she meets the needs for a different type of love relationship. Sternberg breaks down those types of relations into ones of liking, infatuation, emptiness, romance, companionship, and infatuation (Figure 1). In order to determine an adolescent’s capacity for consummate love, this paper will consider an adolescent’s ability to fulfill the three components of love.

Adolescent Intimacy

The intimacy component of love involves feeling close to another person and enjoying that bond. Sternberg views it as “deriving from emotional investment” (Sternberg, 1986, p. 119) and finds it to be important in all loving relationships, whether romantic or not. There are two main areas of intimacy, one being the literal closeness the partners share with each other and the other being...
each partner's individual identity security (Shulman, et al. 1997). In looking at closeness with another person, it seems clear that adolescents are capable of developing closeness mainly through disclosure. It has been found that girls tend to disclose more than boys in same sex relations (Camerana et al., 1990). In opposite sex relations, however, there is an equality of disclosure between girls and boys (Reisman, 1990). This disclosure in opposite sex relations suggests that boys may feel more capable of developing intimacy in male/female relations. With this capability in place, an intimate closeness can be formed within the context of an adolescent relationship.

In considering individuality in intimacy, adolescence is the time in which adolescents are defining themselves (Erikson, 1980). Only when an adolescent finds security in their identity can they have a mature intimacy (Duvall, 1964) that allows for relational stability. If a person can only define themselves within the context of a relationship and is not able to recognize their individual nature, they are less likely to form a relationship that is intimate and secure. Adolescents who don't recognize their identity and have lower aspirations will tend to fall in love more easily as they seek marriage as a means to escape unsatisfying circumstances (Duvall, 1964).

Although adolescents may be capable of disclosing intimacies with a person of the opposite sex, they may still be struggling to develop their individual identities. Intimacy also has been found to increase in both genders during the transition between early and late adolescence (Buhmester, 1990). This age-related aspect of intimacy further implies adolescents are developing their ability towards true intimacy. It can then be argued that those identity seekers and intimacy developers will struggle with intimacy in relationships—thus lessening their ability to be in consummate love.

Adolescent Passion

The passionate aspect of love is defined as arousal driven by sexual and romantic desires but is not fully sexually driven. It is a love based on overpowering emotions that create a need for immediate gratification. The two areas of passion that should be considered in adolescents’ ability to love are adolescent romantic partnerships and neurological developments because of societal influences on romantic partnerships and developmental aspects of adolescent growth.

During adolescence there seems to be a desire to have romantic partners, most likely driven by peer and societal influences (Rivadeneyra & Lebo, 2008) as well as passionate desires. Intimacy regarding emotional closeness is often found in peer relationships, but a romantic relationship has the added emotional experience of passion. One study found that more than half of young adults (college students) consider their closest relationship to be with a romantic partner (Berscheid, Snyder, & Omoto, 1989). This suggests that intimacy with a friend may not be as fulfilling as an intimate relationship that includes elements of passionate closeness.

Studies in adolescent neurological development have found that the emotional limbic system is further developed than the rational prefrontal cortex. In emotionally driven situations, the limbic system controls adolescent behavior (Casey et al., 2007). Adolescents tend to base their decisions on behaviors that will provide them with immediate rewards rather than basing their choices on long-range outcomes (Galvan et al., 2006). During adolescence there seems to be a desire to have romantic partners, most likely driven by peer and societal influences (Rivadeneyra & Lebo, 2008) as well as passionate desires. Intimacy regarding emotional closeness is often found in peer relationships, but a romantic relationship has the added emotional experience of passion. One study found that more than half of young adults (college students) consider their closest relationship to be with a romantic partner (Berscheid, Snyder, & Omoto, 1989). This suggests that intimacy with a friend may not be as fulfilling as an intimate relationship that includes elements of passionate closeness.

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Adolescents are clearly capable of passion. Due to their desires to be in relationships with passionate closeness,

https://scholarsarchive.byu.edu/intuition/vol5/iss1/11
and their use of the emotional and immediacy part of the brain, it can be assumed that they are capable of fulfilling the passionate component of consummate love.

Adolescent Commitment

The commitment aspect of love is the cognitive ability to decide to care for someone based upon logical reasoning and dedication. Although the degree of commitment in love can vary across different relationships, it is a necessary component in order for long-term love to survive because commitments validates a relationship as something with future plans.

Adolescents are capable of making commitments as seen in situations outside of romantic relationships. One study looked at adolescents in group treatment for marijuana use (Engle, 2007). Individual adolescent commitment was negatively correlated with future marijuana use. This shows that if an adolescent makes a commitment to stop using marijuana, they are likely to fulfill that commitment. Social influences also impact adolescent commitment by influencing adolescents in the choices they make. In this same study, group commitment (the support of negative or positive group member remarks) influenced the future marijuana use of group members (Engle, 2007). Although this study does not show commitment in adolescent romantic love, it does show their commitment ability and societal influences upon commitment. To further this discussion of adolescent commitment, psychosocial influences and adolescent neurological development will be explored.

Cognitive abilities of children and adolescents are substantially different from adults (Keating, 1990). Some researchers would argue that full reasoning abilities are developed by mid-adolescence (Fischhoff, 1992). When considering the influence of psychosocial influences, this ‘development’ becomes less clear (Steinberg & Cauffman, 1996). The more social influences affect adolescents, the less efficient they are at making decisions regardless of the maturity of their cognitive processes (Steinberg & Scott, 2003). If there is pressure based upon a peer group to be in a relationship, this may create a quasi-commitment that is not stable. This commitment would be based upon social approval rather than a long term desire to be with another person. Although that is a commitment it isn’t commitment based on personal desire and may not be long term in nature.

Another important factor to consider concerning adolescent commitment is that of the prefrontal cortex, or the area of the brain devoted to decision making. This area of the brain is not fully developed in adolescents and as previously discussed, may lead them to overuse their limbic (emotional) system (Casey et al. 2007; Yurgelun-Todd, 2007). The prefrontal area that is developing is not only helpful in reasoning, it is also an area implicated in long term planning (Spear, 2000). If adolescents have a lowered ability to make long term plans, their commitment towards a relationship may be of a fleeting nature.

It thus seems logical to argue that adolescents are not as capable of having a committed relationship as adults who have more stability in their mature state. Due to an adolescent’s heavy reliance on social influences and underdeveloped prefrontal cortex, their commitment to a relationship is highly questionable.

Consummate Love Ability

Given the above discussion, are adolescents able to experience consummate love? According to Sternberg’s triangle of love theory and the conclusions drawn in this paper, adolescents can have full development of the passion component but less development of intimacy and commitment components. One could argue that an adolescent who has developed an identity is capable of experiencing intimacy. One could also argue that an adolescent with a well developed prefrontal area who is not highly influenced by psychosocial factors is capable of experiencing commitment. Taking both of those and the ability of adolescents to experience passion, it can be possible for an adolescent to experience consummate love.

Although it is possible for an adolescent to experience consummate love, this ability is unlikely. Intimacy requires an adolescent to be close with another person and to have a fully developed identity. Although adolescents may become close to one another through self-disclosure, they are still developing their identities, and thus are still learning how to be intimate. Passion calls for adolescent romantic desires and immediate gratification. The majority of adolescents desire romantic relations, and due to neurological limbic control, they make decisions based on...
positive immediate rewards. Adolescents can clearly experience passion. Commitment necessitates an adolescent’s personal relational dedication and long term decision making. Adolescents are less efficient at making personal decisions due to social influences, they may enter a relationship for approval rather than personal desire to be with another person. They are also less adept at making long term decisions due to their underdeveloped neurological system.

It should also be noted that persons of other cultures as well as persons from previous eras may have had a different experience of consummate love. The Triangular Theory was developed as an indicator of consummate love ability for persons in the current time period, specifically studying persons in the Western world. The author acknowledges that considerable differences are found in other cultures and eras which renders this theory limited in its scope.

Given the population of interest (adolescents of the Western world), the evidence shows that the majority of adolescents, due to their inability to have true intimacy and commitment in their relationships, cannot experience the fullness of love as defined by Robert Sternberg’s Triangular Theory. The love that these adolescents may be misconstruing as true love is, according to Sternberg, ‘infatuation.’ This type of love relationship is based solely on the component of passion, with the absence of intimacy and commitment. Those experiencing infatuation experience psychophysiological arousal like hormonal secretions and increased heartbeat (Sternberg, 1986, p. 124). Given the evidence of adolescents’ neurological emotionality, it could be argued that adolescents may experience this higher degree of psychophysiological arousal found in infatuation and may be in a state of infatuation rather than love.

**Conclusion: Romeo and Juliet**

Romeo and Juliet may be the ideal representatives of adolescent passion. With their need for immediacy and dramatization of love they experience pure passion and would rather die than live without each other (Schwaber, 2006, p. 299). According to Sternberg’s Theory what our culturally enshrined star crossed lovers and the majority of adolescents feel is a passionate bliss, rather than an intimate, committed, and consummate love that can last a lifetime. Adolescence is a time of constant flux and continual development. Without intimacies created through formed identities and passion offset with commitment, consummate love with regards to Sternberg’s conceptualization, is not possible. This paper, using Sternberg’s theory as a basis for evidence, suggests that adolescents may love someone, but they can’t truly be in consummate love.

**References**


Will Narcissists Distort? Personal Perceptions of Success and Failure in Narcissistic Individuals

John Asay, Robyn Brough, Blake Hudson, and Peter Decker

ABSTRACT This study examines the relationship between participants' levels of narcissism and their perceptions of success. The researchers hypothesized that more narcissistic individuals would perceive greater success on a word unscrambling test compared to less narcissistic participants. Seventy-eight BYU undergraduates completed the NPI-16 (a measure of narcissism), followed by an easy or difficult word unscrambling test, and then a demographic questionnaire. Results showed that more narcissistic participants did perceive greater personal success than less narcissistic participants, regardless of test difficulty. These findings show support for self-deception as a key to grandiose narcissism. Further research could investigate whether task difficulty influences narcissistic self-deception, and whether non-grandiose narcissists engage in similar self-deception.

Will Narcissists Distort?

It is estimated that about one percent of the population suffers from clinical narcissism, a personality disorder characterized by lack of empathy, fixation on self, and grandiosity. The DSM III-TR first introduced Narcissistic Personality Disorder (NPD) as a mental health diagnosis in 1980. As with any disorder, NPD is made up of many facets which are still being studied (Raskin & Terry, 1988). Narcissists generally exhibit greater autonomy, willfulness, and hypersensitivity (Wink, 1992). Maladaptive narcissism is characterized by infatuation with the self to the exclusion of others and an overwhelming drive towards self gratification, relying on self-deception to maintain the illusion of self-importance (Raskin, Novacek & Hogan, 1991). Narcissists tend to react differently than others to success and failure, often attributing failure to external causes or sources (Stucke, 2003). Doing so allows them to avoid the anger and sadness that result from the revelation of their faults. Narcissists experience a greater than normal emotional response to success and failure (Rhodewalt & Morf, 1998), but little research has been done regarding the narcissist's ability to perceive his or her own success or failure (John & Robins, 1994).

Because few studies have documented the relationship between self-perception and narcissism, the present study investigated narcissists' ability to accurately perceive success and failure. Narcissists, as defined in the DSM-IV, exhibit grandiose ideation. They often engage in self-deception to preserve their aggrandized view of themselves (Raskin et al., 1991) and show consistent distortion of perception in regards to their performance (Gabriel, Critelli, & Ee, 1994). Narcissists will consistently overrate their personal ability when compared to others' performance or to clinicians' assessments. There seems to be a lack of information specifically concerning narcissism and personal perceptions of success when failure is experimentally induced. The present study evaluated participants' reactions to induced failure, and theorized that those with higher levels of narcissism would significantly distort their perception of success.

Narcissism is specifically described as psychological self-absorption (Akhtar & Thomson, 1982). The narcissistic focus on self becomes unpalatable to those who recognize their own faults. Grandiosity, an inflated appraisal of one's worth, power, knowledge, importance or identity, serves to enable narcissistic thinking. As described in the DSM-IV, one of NPD's primary traits is grandiosity. Better stated, grandiose constructs comprise one of the two major themes of narcissism (Cain, Pincus, & Ansell, 2007). Grandiosity relies on the belief in a fictional ideal self and denial of reality (Raskin et al., 1991) and this aspect of narcissism is the focus of the present study.

Narcissists routinely overestimate their own success, using comparative enhancement strategies in addition to non-comparative enhancement strategies (Campbell, Reeder, Sedikides & Elliot, 2000). Non-narcissistic individuals are likely to underreport their success, whereas highly narcissistic individuals greatly over report their
success (John & Robins, 1994). For non-narcissists, viewing their performance leads to decreased self-enhancement; for narcissists, self-enhancement of performance increases in these situations (Robins & John, 1997). Additionally, narcissists report a high level of interpersonal sensitivity despite the fact that they consistently show very low levels of interpersonal sensitivity (Ames & Kammrath, 2004). Narcissism also positively correlates with self-reported intelligence (Gabriel et al., 1994). Because grandiose narcissism and self-deception are positively correlated, it was expected that participants with higher levels of grandiose narcissism would unconsciously replace the failure they experienced with a feeling of success, or possibly relative success.

In subjective settings, narcissists report greater success than people inside and outside their social circumstances (John & Robins, 1994). However, current and past research concerning narcissism and success or failure is not complete. While much research shows motivation for distortion of perception and actual distortion of perception in regards to performance, no research has experimentally demonstrated reportable amounts of alteration to perception. The next step is to measure perception of success with regards to actual, concretely measurable success in the context of narcissism. Rather than measuring specific traits of narcissism or effects of specific feedback on narcissistic individuals, the goal of the present study was to correlate levels of narcissism and test difficulty with perceptions of success or failure.

It was hypothesized that participants with higher levels of narcissism would have greater perceptions of personal success, regardless of test difficulty. An alternative hypothesis was that test difficulty would affect distortions of success; for example, narcissistic participants may have perceived higher levels of success only if the test were easy as opposed to difficult. Nevertheless, it was hypothesized that, in general, participants who scored higher on the narcissism scale would rate themselves as more successful, compared to less narcissistic individuals who would rate themselves as less successful. Analysis included participants' perceptions of success or failure in comparison to their actual success or failure.

**Methods**

**Design**

This cross-sectional study was conducted within three weeks at Brigham Young University. Participants first completed the NPI-16, which assessed level of narcissism. Participants then completed one of two forms of a word unscrambling test. The unscrambling test consisted of ten items, which were words to be unscrambled by the participant. The participants were told that they could guess on any item even if they weren't sure of the correct answer. The "easy" test consisted of ten words which were short in length and easily decipherable. The hard test was compiled of ten words, two of which were actual words (although not in the least bit common), and the rest being letter combinations that could not possibly be unscrambled into words. In order to manipulate the independent variable (test difficulty), half of the participants received an easy test, while the other half received a difficult test. The participants were unaware that different forms of the test were handed out. Following a 10 minute time limit, the tests were collected and then a questionnaire, including questions about demographics, was distributed. To validate the manipulation of test difficulty, participants marked a 10-point Likert scale how difficult they believed their test was, regardless of their performance. Participants then marked a 10-point Likert scale, which assessed the dependent variable, participants' perceptions of personal success or failure, as well as filled out demographic information. Confounding variables may have included GPA and differing abilities in completing the test; thus, questions about GPA and previous experience with word unscrambling were included in the follow up questionnaire as well.

**Participants**

Seventy-eight BYU undergraduates from psychology courses were recruited without respect to gender, race, age, or socioeconomic status. No inclusion or exclusion criteria were employed in the selection of research participants. IRB approval was obtained prior to beginning the study, and all participants signed an informed consent form.

**Materials**

The NPI-40 has been used as the leading indicator of
TABLE 1

Summary of Demographic Information, Manipulation Check, and Covariates

<table>
<thead>
<tr>
<th>Variable</th>
<th>Difficult Test Group</th>
<th>Easy Test Group</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>22.03 (6.1)</td>
<td>21.49 (3.1)</td>
<td>.736</td>
</tr>
<tr>
<td>Gender (% Female)</td>
<td>54.1%</td>
<td>53.7%</td>
<td>.972</td>
</tr>
<tr>
<td>Ethnicity (% White)</td>
<td>83.8%</td>
<td>90.2%</td>
<td>.394</td>
</tr>
<tr>
<td>Class/Year (% Soph)</td>
<td>37.8%</td>
<td>22.0%</td>
<td>.317</td>
</tr>
<tr>
<td>Major (% Psych)</td>
<td>48.6%</td>
<td>53.7%</td>
<td>.415</td>
</tr>
<tr>
<td>English (% Native)</td>
<td>97.3%</td>
<td>95.1%</td>
<td>.539</td>
</tr>
<tr>
<td><strong>Manipulation Check</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test Difficulty</td>
<td>7.78 (2.1)</td>
<td>5.39 (2.4)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Covariates</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text Twist</td>
<td>1.54 (0.5)</td>
<td>1.59 (0.5)</td>
<td>.631</td>
</tr>
<tr>
<td>Text Twist Frequency</td>
<td>1.94 (0.7)</td>
<td>2.59 (1.1)</td>
<td>.829</td>
</tr>
<tr>
<td>GPA</td>
<td>3.46 (0.4)</td>
<td>3.4 (0.5)</td>
<td>.734</td>
</tr>
</tbody>
</table>

Narcissistic Personality Disorder since its creation and is statistically reliable (α=0.84), valid, and shows accurate levels of narcissism in any given individual (Raskin & Terry, 1988). This study employed a shortened version of the NPI, called the NPI-16, which includes 16 questions and has slightly less reliability than the NPI-40 (α=0.72); these two measures were correlated at r=0.90 (p < .001). The participant must select one of two choices that best describe their personality, such as: a) “I am an extraordinary person,” or b) “I am much like everybody else.” One of the choices is attributed to a narcissistic personality and the other is not, and the responses are scored accordingly. This shortened version of the NPI has roughly the same reliability and validity scores as the original NPI-40, and is practical in situations where time is limited (Ames, Anderson & Rose, 2006).

The level of perceived success for each participant was measured with a questionnaire using a 10-point Likert scale. The scale asked the participant to rate their perceived level of success based on points ranging from 1 (very unsuccessful) to 10 (very successful). Participants reported perceptions of test difficulty, which served as a manipulation check.

**Procedure**

At the time of testing, the researchers greeted participants briefly with a simple welcome and thanks for volunteering. The measure was administered in a group setting, and a brief introduction to and explanation of the study ensued, including that the purpose was to determine success and failure on a specific task. The participants were informed that the experiment would occur in three parts: first filling out a personality questionnaire, taking
a word unscrambling test, and then completing a follow-up questionnaire and demographics sheet. After signing the consent form, participants filled out the personality questionnaire (NPI-16). An explanation of the "scrambled-word test" followed, and it was indicated that each participant would receive the same test. Different forms of the test were randomly assigned to participants; in each session of the experiment, half of the participants received a difficult test and the other half received an easy test. Participants had a 10 minute time limit for this portion of the experiment, but completion of the task was not required. Following the 10 minute time limit, participants filled out the self-report questionnaire, which assessed participants' perceptions of success. They also rated the difficulty of the test, regardless of their personal perception of success or failure, and this served as the manipulation check. A quick debrief took place at the end of the experiment, and participants understood that there were, in fact, two forms of the word unscrambling test. Any further inquiries were answered on an individual basis.

Results

Data was analyzed using both descriptive and inferential statistics. All analyses were conducted using the SPSS 15.0 computer program. Means and standard deviations (or percentages) were used to descriptively examine if there were any differences between the experimental groups. To inferentially analyze the main effect of narcissism and perceptions of success, the General Linear Model procedure was used to obtain ANOVA data.

The means and standard deviations (or percentages) for the main variables are presented in Table 1. The dependent variable (perception of success) was normally distributed, having no significant outliers or problems with skewness or kurtosis. The two experimental groups did not differ on the demographic measures of age, gender, ethnicity, year in school, English as a native language, or major, indicating that the groups were roughly equal demographically (Table 1). The manipulation check showed that participants in the difficult test group rated their test as significantly more difficult, as compared to the ratings of the participants in the easy test group (Table 1), indicating that the experimental treatment had the desired effect.

The main hypothesis was that participants with higher levels of narcissism would distort their perceptions of success and rate themselves as more successful, regardless of which test form they completed. Participants filled out the NPI-16 questionnaire, then took the word-unscrambling test. Those whose NPI-16 responses were above average (mean) when compared to the other participants were labeled as "high narcissists." Those measuring below the mean were labeled as "low narcissists." A 2 (narcissism level) by 2 (test difficulty) ANOVA revealed a main effect of narcissism on perceived success rating (F(1, 76)=5.10, p < .05) (Table 2).

In the difficult test group, participants who were more narcissistic rated success at a mean of 3.00 (SD=2.4), while participants who were less narcissistic rated success at a mean of 1.89 (SD=1.7). In the easy test group, participants who were more narcissistic rated success on the 10-point Likert Scale at a mean of 3.00 (SD=2.4), while participants who were less narcissistic rated success at a mean of 1.89 (SD=1.7).

The results are summarized in Table 2 and Table 3.
a mean of 8.29 (SD=1.3), while participants who were less narcissistic rated success at a mean of 7.58 (SD=1.5) (See Figure 1). Perceptions of success were also measured by asking participants how many questions out of 8 they believed they answered correctly. This measure approached significance (F(1, 76)=3.90, p < .052; See Table 3). In the difficult test group, participants who were more narcissistic believed they correctly answered a mean of 1.78 questions correctly (SD=2.4), while those who were less narcissistic believed they correctly answered a mean of .84 questions correctly (SD=1.6). In the easy test group, participants who were more narcissistic believed they answered a mean of 7.06 questions correctly (SD=1.0), while those who were less narcissistic believed they answered a mean of 6.46 questions correctly (SD=1.6) (See Figure 2). Thus, the main hypothesis received support that narcissism affects perceptions of success.

An alternative hypothesis was that participants with higher levels of narcissism would distort perceptions of success differently depending on which test form they completed (See Table 2). The data do not support this hypothesis, however (p=.625), indicating that narcissists distorted regardless of the task difficulty.

Discussion

As was hypothesized, narcissists perceived their level of success to be higher than non-narcissists on both the hard and easy tests. One goal of the study was to see if the actual abilities of narcissists to perceive levels of success were altered due to the high levels of the trait prevalent in their personality. The experiment was constructed in a way to determine if those with higher levels of narcissism exhibit a greater amount of perceived personal success. Previous studies have shown that narcissists generally will self enhance in ego involving situations (John & Robins, 1994). A potential weakness of previous studies has been the subjective nature of performance measurement. The main purpose of this study was to clarify the nature of narcissists’ self deception by demonstrating self deception objectively. By showing an increase in perception of success despite the impossible nature of the difficult test, the results support the idea...
that narcissists actually deceive themselves—that they inflate their perception of success.

Previous research demonstrates the correlation of grandiose narcissism to self deception (Raskin et al., 1991). This correlation was further demonstrated by studying the relationship between self and other's perception of success on a business task (John and Robins, 1994). Due to the subjective nature of that task, much effort was needed to demonstrate the validity of neutral observers' reports of success on a business task. The findings from the present experiment support the idea that narcissists actually inflated their self-perception. More narcissistic individuals reported greater perception of success on both the relatively easy and difficult word unscrambling tests. As mentioned above, the impossible nature of the difficult test supports the idea that narcissists self deceive; the fact that a similar increased perception of success exists for narcissists who took the easy test supports the idea that narcissistic self deception is not limited to impossible tasks, but instead takes place in all tasks. This study adds credibility to the conclusions of previous research, further demonstrating the link between narcissism and self deception.

Narcissists confronted with their failure exhibit a greater than average emotional response. Most people feel discomfort when something they believe turns out to be false; narcissists, whose self esteem is more directly linked to self perception, feel personally threatened or even attacked when their false perceptions are exposed. This explains the fragile nature of their self esteem - because their self esteem is based on misperceptions, they will often be confronted with evidence showing their self perceptions to be false. They must then either accept a blow to their self esteem or continue to self deceive and preserve their grandiose self-image.

Additionally, the results show that narcissistic grandiosity applies specifically to performance on tests. Those administering personality tests or other measures must account for self deception when testing narcissists. All measures specifically used to study narcissists must take this self deception into account. Even non-written assessments should consider the tendency of narcissists to distort the facts.

Although the results seem definitive, there are some weaknesses in the study. Because the participants in this study were all students of BYU, the represented sample population could in fact be different from other populations. The levels of narcissism could have been significantly different than that representative of a normal population, consequently causing a difference in results. Also, the sample was taken from a highly religious population of Latter-day Saint students. Certain practices or beliefs, such as prohibitions against lying or self aggrandizement could have been potential confounds that affected the data.

The study's main goal was to examine perceptions of success with regards to performance on a test. Though the analyzed results showed there was a significant difference between the ratings of test difficulty, it was expected that the differences would be even greater. Perhaps the easy test was not easy enough to provide a good contrast to the hard test. Secondly, not much effort was put into ensuring that participants weren't looking on other participants' answers. Cheating would have added a new confound into the procedure that could have skewed results in a few cases.

Due to inherent factors with the methods used, other explanations of the collected data are possible. The difficult test had words that did not exist. It is possible that some of the participants realized this, and raised their level of perceived success because they knew that the test was impossible. Another alternative explanation could have come from the NPI-16 that was administered prior to taking the word unscrambling test. Because many of the questions on the NPI-16 contained words that are generally associated with confidence and self-reliance, the words could have primed the participants to illicit more confident responses in the demographics and follow-up questionnaire. Lastly, the use of a Likert scale can only result in relative responses from each student. Using a scale implies that each participant would need to have similar judgment on how to rate their performance and difficulty of the test received. Each participant having unique and entirely different backgrounds could have caused a difference in judgments when given a scale based entirely on judgment. This could have caused confounds in the data. Similarly, experiences that might have occurred prior to participating in the examination had the potential to change the self-esteem of any given individual for a period of time. A negative or positive experience could have caused participants to answer questions on the NPI or follow-up questionnaire differently.
This study improves the understanding of narcissists' tendency to distort self perception, but leaves some significant questions unanswered. For instance, the data showed slightly greater differences between more narcissistic and less narcissistic individuals on the difficult test than on the easy test. While the differences were not statistically significant in the present study, further research more directed towards this aspect of self perception could be helpful in clarifying this effect. Narcissistic inflation of self perception could either vary based on the difficulty of the task they engage in, or remain fairly constant regardless of test difficulty; either result would be interesting. Variance of self deception depending on difficulty implies an important relationship between self deception and ego enhancement; otherwise, constant rates of self deception could allow research into corrections in self report surveys based on level of narcissism.

Another angle of approach would be to use the NPI-40 or other inventories of narcissism to measure the link between specific traits of narcissism and self deception. Narcissism is divided into at least two subtypes, grandiose and vulnerable (Wink, 1991). Grandiose narcissism is specifically correlated to self deception (Raskin et al., 1991), but further research could investigate the vulnerable subtype of narcissism. By demonstrating the relationship between vulnerable narcissism and self perception, greater understanding of the similarities and differences of narcissistic subtypes could be obtained.

In sum, narcissists tend to inflate their perceptions of success, even when actual success is impossible. Understanding narcissistic cognitions and behavior patterns may lead to better test instruments for analysis of narcissism, as well as a better understanding of the narcissistic assessment of self.

References


Conformity: The Effects of Misinformation Without Direct Social Pressure

Jeff Gale, Ryan Johnson, and Alex Hale

ABSTRACT Most of the current psychological knowledge about conformity relates to direct social pressure. However, little is known about how people conform to perceived social pressure. This study examined whether individuals conform to perceived, not direct, social pressure in a naturalistic setting. We hypothesized that individuals would conform to perceived social pressure and that females would conform more than males. Participants were invited to guess the number of M&M's in a jar. An experimental group was subjected to fabricated guesses without direct social pressure to conform. Results indicate a main effect for conformity (p<0.001) and for gender (p<0.05). Individuals, especially females, were found to conform to perceived social pressure.

When individuals act according to social norms, consciously or subconsciously, they are said to conform. Evidence of conformity can be found even in basic, everyday decisions. Fujihara (1976) has suggested that such choices are often strongly influenced by the perception of what other people do. Although deciding to align choices with others’ often can be a subconscious process, it may yield less than desirable results. Indeed, social psychological research has demonstrated that people will sometimes conform to others beliefs and actions even if doing so inflicts severe harm on another individual (Cokley et al., 2001; Haney, Banks, & Zimbardo, 1973; Hoffman, Granhag, See, & Loftus, 2001; Jetten, Postmes, & McAuliffe, 2002; and Tesser, Campbell, & Mickler, 1983). In addition, other studies have found that direct social pressure can lead to the acceptance of blatant misinformation (Mudd and Govern, 2004; Wright, Mathews, & Skagerberg, 2005; and Wright, Self, & Justice, 2000).

However, little research has been published on conformity in settings with only perceived social pressure. Garry, French, Kinzett, & Mori (2008) showed that individuals not only comply but also accept misinformation in a setting lacking direct social pressure and that the physical presence of others increases conformity (Haney, Banks, & Zimbardo, 1973; Hoffman, Granhag, See, & Loftus, 2001; Jetten, Postmes, & McAuliffe, 2002; and Tesser, Campbell, & Mickler, 1983). In addition, other studies have found that direct social pressure can lead to the acceptance of blatant misinformation (Mudd and Govern, 2004; Wright, Mathews, & Skagerberg, 2005; and Wright, Self, & Justice, 2000).

Conformity can be influenced by many factors, but one of the most important is social pressure – perceived and real. We defined social pressure as the influence of others intended to alter an individual’s attitudes or behaviors. This pressure can lead people to conform negatively, such as accepting misinformation. Our study analyzed the effects of perceived (subtle) social pressure independent of direct (overt) social pressure on the acceptance of misinformation. Perceived social pressure does not involve social interaction but may be due to information purported to be from other social members. Direct social pressure is based on social interaction. For the purpose of our study, conformity was measured as compliance to what was represented as the majority opinion. Individuals who altered their actions from the norm based on the perceived opinion of others were said to conform.

Research has identified the combined effects of direct social pressure and misinformation on conformity. Asch (1948) showed that social pressure leads most people to conform even when they are aware of misinformation. This study also brought an important question to light: Is direct social pressure, as opposed to perceived social pressure, a necessary condition for conformity? Much of the subsequent research on conformity has focused on direct social pressure and shown that the physical presence of others increases conformity (Haney, Banks, & Zimbardo, 1973; Hoffman, Granhag, See, & Loftus, 2001; Jetten, Postmes, & McAuliffe, 2002; and Tesser, Campbell, & Mickler, 1983). In addition, other studies have found that direct social pressure can lead to the acceptance of blatant misinformation (Mudd and Govern, 2004; Wright, Mathews, & Skagerberg, 2005; and Wright, Self, & Justice, 2000).

However, little research has been published on conformity in settings with only perceived social pressure. Garry, French, Kinzett, & Mori (2008) showed that individuals not only comply but also accept misinformation in a setting lacking direct social pressure, although there was social interaction in the setting. Irwin and Van Holsteyn (2002) found that people’s expectations about voting outcomes conformed to opinion polls. It is unclear whether the conforming behavior they observed resulted from perceived social pressure. Our study sought to build on past research by observing conformity in a situation lacking not only direct social pressure but also social interaction. We assessed whether or not the mere
presentation of information about the opinions of others is enough to produce conformity. We hypothesized that individuals will conform to the misinformation presented when only the perception of social pressure exists, that is, when direct interaction with other participants is absent. Additionally, we analyzed potential differences between levels of conformity in men and women. Previous research has not been clear about gender-based conformity differences. Most research suggests that differences in conformity are dependent on specific factors such as situation (Maupin and Fisher, 1989; Stoner and Panek, 1985; Tuthill and Forsyth, 1982), one study proposed that women conform more than men on common tasks in everyday settings (Reysen and Reysen, 2004). We hypothesized that women would conform more often than men in the situation previously described.

**Method**

**Participants**

A total of 314 participants (157 females and 157 males) completed the experiment without payment. Subjects' ages ranged from 18 to 32 years with a mean of 21.25 years. The participants were Brigham Young University students. They were assigned randomly to three groups: a control group and two conformity groups. The control group contained 74 females and 86 males. The first conformity group contained 49 females and 35 males, while the second conformity group contained 24 females and 26 males. Among the different groups there were 75 freshman, 73 sophomores, 63 juniors, 70 seniors and 10 graduate students. The differential in total participants and participants by gender and year in school is accounted for by those that did not list their gender or year in school.

**Materials**

We prepared two identical, transparent 1 liter jars, each containing 532 Peanut M&Ms. Other materials included a survey asking for demographic information and the participants' guess about the number of peanuts in each jar. Informed consent forms were not used because they were ruled unnecessary by the IRB.

**Procedures**

We recruited passersby to participate in the research by asking them to complete a short survey. The research was collected over two days. On the first day we collected data from those we designated as the control group. On the second day we collected data from those designated as the experimental groups.

Once people agreed to participate, they were asked to fill out a questionnaire including demographic information and their guess of the number of M&Ms. Researchers did not follow a standardized script because it was desirable for participants to be unaware that an experiment was being performed. Participants were told that the study was designed to assess visual spatial ability. They were allowed, two at a time (one per jar), to view the jar of M&Ms and to estimate the number of candies it contained. Donuts were offered as an incentive for the most accurate guess.

Before the second day we analyzed the data obtained from the first day to find the mean and standard deviation of the control group's guesses and as a function of the participants' gender. We used this information to create dummy data sets. The first data set included fake guesses between one and two standard deviations above the mean; participants receiving this manipulation were classified as the moderate-misinformation group. The second data set included fake guesses between two and three standard deviations above the mean; participants receiving this manipulation were classified as the high-misinformation group. Each group was viewed as having conformed if their guesses deviated significantly from the control group and towards the misinformation that was provided. This process was done separately for the male and female data sets. This resulted in a total of four data sets: a male and female data set for both the moderate and high misinformation groups.

On the second day, a new set of participants filled out the same demographic form but were given a coding number and asked to list their guess on a separate sheet of paper that was found on a clipboard. The clipboards contained two sheets that were dummy data sets and a third sheet that was designated for the participant's guess. The moderate-misinformation group dummy data sets were used first, followed by the high-misinformation group dummy data sets. When the experimenter described the recording process to participants, he casually mentioned...
that the guesses shown on the first two sheets were made by
previous participants. Participants were handed separate
clipboards and every effort was made to ensure that each
participant filled out the survey without consulting with
others. After the data were collected, they were stored in
a safe location.

Results

We first analyzed the raw data from each group and
inspected them for outlier scores. Five data points were
eliminated from the analysis because they were statistical
outliers.

We subsequently performed a factorial ANOVA. It
revealed a main effect for conformity \[ F(1, 282) = 44.4,
p < 0.001 \] (see Table 1) showing that as the misinformation
increased so did the amount that participants were willing
to guess regardless of how accurate the guess appeared to
be. There was also a main effect for gender \[ t(242) = 2.974,
p < 0.0025 \] with females guesses matching more closely
to the misinformation provided. The data for gender
needed to be standardized because of the differences in
the conformity scales which were based on the means and
standard deviations of each gender. After standardization
of the scales the gender difference continued across
conditions.

Discussion

We hypothesized that individuals would conform to
perceived social pressure and that women would conform
more than men. Our results supported our hypotheses,
such that the average guess was significantly closer to the
misinformation provided than the average guess when no
information was provided, and that the guesses tended to
become more extreme when the misinformation became
more extreme. We also found that women tended to
match their guesses more closely to the misinformation
than did men.

Contemporary Western culture strongly values
a nonconformist individuality (Jetten, Postmes, &
McAuliffe, 2002). The effects of subtle pressure to conform
come without any apparent attack on one's individuality.
With regard to our study, a participant may have thought
he or she was guessing the number of M&Ms in a jar
independently of others, but because of the inclusion
of the dummy data sets, was nevertheless influenced by
others, if indirectly. Had the pressure been direct (verbal
couragement) it is possible that participants may have
demonstrated reactance and actually lowered the amount
of their guess.

Additionally, we found that female guesses tended to
match the fake numbers more than males guesses did.
This result is consistent with Reysen and Reysen's (2004)
finding that sex differences in conformity occur in everyday
settings. However, male numbers may have matched the
fake guesses less because the women were given higher fake numbers to begin with. Future studies might address whether men and women conform differently in response to indirect social pressure that provides them with the same information.

Our results also showed that older individuals tended to conform less than younger individuals (see Table 2). Freshmen, sophomores, and juniors all showed increases in mean guesses between the control group and the first and second conformity groups. However, seniors and graduate students showed decreases in mean guesses between the first to the second conformity groups in comparison to the control group, with graduate students showing a statistically significant, more marked decrease. Thus, within the age range of our participants, an increase in age was accompanied by a decrease in susceptibility to perceived social pressure. Because graduate students made up a small portion of participants, their information may need to be tested further using a larger sample. Seniors, however, had a larger number of participants so their data may be more indicative of the true population. Further research may address this result across a wider age range.

As previously mentioned, the sample was limited to a specific population in Provo, Utah, namely, students at Brigham Young University. This institution possesses specific cultural norms due to the mostly LDS population and the college lifestyle. This constitutes a possible limitation of the study. Another possible limitation was the fact, that the verbal instructions presented to participants were not always the same. There researchers generally followed the same procedure when instructing participants so as to avoid direct social pressure, but without a set script, it is possible that individuals may have been influenced by different researchers. However, it may have been beneficial not to have followed a strict script because we wanted to observe people's actions in an everyday setting. With these limitations taken into consideration, we remain confident about the implications of our results, namely, that perceived social pressure may exert a substantial influence on one's tendency to conform.

References


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ABSTRACT
Academic maladaptive perfectionism, manifested through symptoms such as compulsive strivings and anxiety, is a common trait among college students. At present, no brief scales focus solely on perfectionist tendencies in the academic realm. The Maladaptive Academic Perfectionism Scale was designed to validly and reliably measure the emotional and behavioral domains of academic maladaptive perfectionism. One hundred Brigham Young University students completed the test. Results showed both the behavioral and emotional domains to be reliable, while only the emotional domain was valid. Once revised, this test could be used by college counselors to help identify maladaptive traits in the students they assess.

Perfectionism, pervasive among college students, is characterized by setting extremely high academic standards (Rice & Lopez, 2004; Trull & Vieth, 1999). Research frequently divides perfectionism into two categories: adaptive and maladaptive (Hewitt & Flett, 1991; Slaney & Suddarth, 2001). Although adaptive perfectionism can be beneficial in reducing stress and increasing life satisfaction, maladaptive perfectionist standards can have a negative impact on students by allowing little room for error and thus resulting in a fear of failure (Martin, 2006; Frost, Marten, Lahart & Rosenblate, 1990). This fear of failure can then lead students to feel anxious or depressed and may lead to other serious psychiatric disorders (Henning, Ey & Shaw, 1998). Thus, it is important to identify individuals prone to maladaptive perfectionism before they exhibit any negative symptoms, so that they can receive help or counseling to correct these maladaptive traits. Tests, such as the Multidimensional Perfectionism Scale, exist to assess maladaptive perfectionism; however, such scales are long and do not measure academic traits (Ferrari & Mautz, 1997). The purpose of this study is to create a brief scale to measure maladaptive academic perfectionism.

To create this brief scale, maladaptive perfectionism will be operationally defined by behavioral and emotional manifestations. Behavioral manifestations are characterized by setting and holding unrealistic self-standards and by having compulsive strivings. Emotional manifestations are characterized by symptoms of depression and anxiety.

An individual that exhibits behavioral manifestations of maladaptive perfectionism is prone to setting unrealistic work standards and subsequently making extreme self-evaluations. These students do not focus on personal success but instead compare themselves to others (Frost & Flett, 1991). An additional behavioral manifestation is shown through compulsive strivings, wherein students will consistently repeat behaviors, which are believed to help them in their quest for perfection. Frost, Marten, Lahart and Rosenblate (1990) found significant correlations between scales that measured dimensions of maladaptive perfectionism and scales that measured obsessive-compulsive behavior.

The manifestations of maladaptive perfectionism are not limited to the behavioral domain, however, and are often exhibited through emotional features such as depression and anxiety. Students with maladaptive perfectionism do not allow for error in their rigid standards and this inflexibility can lead students to feel distressed when they are unable to fulfill their self-appointed norm of perfection. This distress can then be manifested through depressive symptoms (Hewitt, Flett, & Ediger, 1996; Rice, Ashby & Slaney, 1998). Other research has found that when controlling for anxiety, maladaptive perfectionism accounted for a significant amount of variance in depression (Kawamura, Hunt, Frost & Dibartolo, 2001). Anxiety, however, is also linked to maladaptive perfectionism, and is shown to be a significant factor independent of depressive symptoms (Kawamura et al., 2001). Individuals with anxiety are overly concerned with making mistakes and view their work in concrete terms of total success or
failure (Ferrari & Mautz, 1997; Rice & Dellwo, 2001). Because it is impossible for students to complete their class work and homework perfectly in all situations, any type of failure naturally leads maladaptive perfectionist students to feel depressed and anxious.

Research suggests that traits of maladaptive perfectionism are associated with both current and future negative psychological functioning (Hewitt & Flett, 1991; Hewitt et al., 1996). This study will seek to identify these associated traits by measuring behavioral and emotional manifestations. It is hypothesized that the Maladaptive Academic Perfectionism Scale (MAPS) will reliably and validly measure maladaptive academic perfectionism in college students.

Method

Participants

A convenience sample of 50 female and 50 male undergraduate students from Brigham Young University (BYU), with ages ranging from 18 to 28, completed the MAPS. Participants were recruited from student housing, undergraduate classrooms, and the university library.

Item Construction

Researchers used the Content Validity Ratio (CVR) method to ensure that the MAPS contained items that measured maladaptive academic perfectionism. The CVR method is commonly used to ensure that items on a test accurately represent the content that the test is purportedly measuring. In order to do this, a panel of expert judges is asked to rate test items on a set scale. The items which are rated highly are judged to be representative of a construct, and are then included on the test (Sireci, 1998). In this study, a panel of 12 undergraduate psychology student judges was briefly trained in the manifestations of maladaptive perfectionism. These judges were then asked to rank the 30 test items as being relevant to the domains of behavioral and emotional manifestations. The top 10 rated items (CVR ≥ 0.00) were selected (see Table 1). Questions were presented in a 4-point Likert scale ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). Five of the ten items were negatively worded and reverse-scored to control for response bias.

Table 1. Items from the MAPS.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>I never think the work I do is good enough.</td>
</tr>
<tr>
<td>2</td>
<td>I constantly worry that I won’t do well on assignments.</td>
</tr>
<tr>
<td>3</td>
<td>I worry that others will discover that I am not as smart as they think I am.</td>
</tr>
<tr>
<td>4</td>
<td>I feel bad about myself when I don’t get the grade I wanted on a test.</td>
</tr>
<tr>
<td>5</td>
<td>I don’t dwell on my mistakes.</td>
</tr>
<tr>
<td>6</td>
<td>I judge my abilities in learning by the grades I receive.</td>
</tr>
<tr>
<td>7</td>
<td>I read my entire class syllabi multiple times.</td>
</tr>
<tr>
<td>8</td>
<td>It is not important if I make a mistake in my school work.</td>
</tr>
<tr>
<td>9</td>
<td>It does not matter if I get less than 100% on a test.</td>
</tr>
<tr>
<td>10</td>
<td>I generally don’t have to plan when I will get homework done in my day.</td>
</tr>
</tbody>
</table>

Test Administration

Undergraduate students were asked to sign a consent form. They then received standardized hard copies of the MAPS and were told that it would take two to four minutes to complete. No other instructions were given.

Statistical Analysis

SPSS 15 was used to analyze the data. Reliability was measured using Cronbach’s alpha and Pearson bivariate correlations. Face and content validity measures were used and data reduction was completed through factor analysis. Data reduction was needed in order to condense the 30 possible MAPS items into a more succinct 10 item questionnaire. This factor analysis was also necessary to determine whether the items on the MAPS clustered into two meaningful domains of behavioral and emotional manifestations of maladaptive perfectionism.
Table 2. Pearson Correlation Coefficients.

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<td>05</td>
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<td>08</td>
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<td>02</td>
<td>0.48**</td>
<td>1.00</td>
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<tr>
<td>03</td>
<td>0.41**</td>
<td>0.43**</td>
<td>1.00</td>
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<tr>
<td>04</td>
<td>0.24*</td>
<td>0.37**</td>
<td>0.24*</td>
<td>1.00</td>
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<td>05</td>
<td>0.14**</td>
<td>0.15</td>
<td>0.25*</td>
<td>0.22*</td>
<td>1.00</td>
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<tr>
<td>06</td>
<td>0.26*</td>
<td>0.30**</td>
<td>0.17</td>
<td>0.35**</td>
<td>0.47**</td>
<td>1.00</td>
<td></td>
<td></td>
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<tr>
<td>07</td>
<td>0.27**</td>
<td>0.29**</td>
<td>-0.09</td>
<td>0.03</td>
<td>0.04</td>
<td>0.33**</td>
<td>1.06</td>
<td></td>
<td></td>
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<tr>
<td>08</td>
<td>0.14</td>
<td>0.06</td>
<td>0.04</td>
<td>0.32**</td>
<td>0.24*</td>
<td>0.42**</td>
<td>0.18</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>0.24*</td>
<td>0.20*</td>
<td>0.01</td>
<td>0.15</td>
<td>0.08</td>
<td>0.37**</td>
<td>0.25*</td>
<td>0.47**</td>
<td>1.00</td>
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<tr>
<td>10</td>
<td>0.07</td>
<td>0.21*</td>
<td>0.04</td>
<td>0.23*</td>
<td>0.36**</td>
<td>0.21*</td>
<td>0.32**</td>
<td>0.25*</td>
<td>0.06</td>
</tr>
</tbody>
</table>

* Significant at 0.05 level (2-tailed). ** Significant at 0.01 level (2-tailed).

Results

To determine whether the 10 MAPS items clustered into the domains of behavioral and emotional manifestations, a principal component factor analysis was run in SPSS. This factor analysis revealed that four components accounted for a majority (68.56%) of the variance. Three of these four components consisted of items from the behavioral manifestations domain, while the other component consisted of items solely from the emotional manifestations domain. These results suggest that items in the behavioral domain were neither reliable nor valid. Items in the emotional domain, however, were reliably clustered and correlated consistently with one another.

Cronbach's alpha indicated the test's internal consistency was moderately reliable (α = 0.75). A Pearson bivariate analysis revealed that 30 of 45 correlations were significant (p < 0.05) and that 17 of 45 correlations were significant (p < 0.01; see Table 2). These correlations suggest that a majority of the items were significantly related to one another, thus lending support to the reliability of the measure. Three of the ten items had high content validity (≥ 0.83), one item had marginal content validity (0.67), and six items had low content validity (≥ 0.00). Twelve percent of participants correctly identified the construct, indicating that the test was not face valid.

Discussion

The purpose of this study was to design a test that would reliably and validly measure maladaptive academic perfectionism in college students by using emotional and behavioral domains. This test was adequately reliable with high internal consistency. Although the emotional domain generally loaded onto one component, the behavioral domain was spread across three components. Thus, the results supported the validity and reliability of the emotional domain, but not the behavioral domain of the MAPS.

One limitation of this test was the MAPS' failure to capture the behavioral domain. CVR ratings for the behavioral items were consistently lower than the emotional items. Factor analysis also reflected this weakness. Items 6 and 8 loaded onto the emotional component as they may have measured the participant's feelings, instead of behavioral manifestations. In addition to this, unclear wording influenced items 7, 9, and 10 which caused these items to load onto two separate components. One further limitation of the study is the manner in which validity was demonstrated. A panel of 12 fellow undergraduate psychology students judged the content validity of the MAPS items. These students were not experts in the field of perfectionism study, and judged the validity of each questionnaire item quickly. Consequently, it is difficult to know whether the evaluation of the items was truly valid or not.

High reliability, internal consistency, and low face validity are statistical strengths of the MAPS. The high Cronbach's alpha demonstrated that a majority of the items consistently measured aspects of maladaptive perfectionism, especially in the emotional domain. Thus the emotional domain of the MAPS can be trusted as reliable in identifying characteristics of students who may be prone to maladaptive perfectionism. Internal consistency was demonstrated through the large number of signifi-
cant correlations among items. This consistency suggests that the MAPS items are successful in repeatedly meas­uring traits that are consistent with maladaptive perfectionism. Low face validity was desired, because the MAPS was measuring a potentially socially undesirable trait. The achievement of low face validity suggests that students are not able to alter their answers to appear socially desirable.

The MAPS contributes to current research on perfectionism by introducing a brief measure of maladaptive perfectionism within the realm of academic experience. The MAPS is consistent with other research, which shows that maladaptive perfectionism is associated with depression and anxiety (Kawamura et al., 2001; Rice et al., 1998). In the future, it would be necessary to further define and retest the behavioral domain of maladaptive perfectionism. Once this has been achieved, convergent validity could be established by comparing it to other maladaptive perfectionism scales already in use. Once validity is established, both college counselors and students might use the MAPS to help identify and address maladaptive traits, before behavioral and emotional problems occur. In this way the MAPS may help to identify and predict students predisposed to suffer from anxiety or depression because of maladaptive perfectionist tendencies, and help college counselors teach these students how to overcome their negative habits before any psychological problems develop.

The purpose of this study was to test the hypothesis that the MAPS would reliably and validly measure maladaptive academic perfectionism. The scale sought to identify both behavioral and emotional aspects, but was only able to reliably and validly measure the emotional domain. After further improvements in measuring the behavioral domain are made, the MAPS could be a useful tool in assisting college students who may suffer from maladaptive perfectionism.

References


Slaney, R., & Suddarth, B. (2001). An investigation of

Abstracts from the 2009 Mary Lou Fulton Mentored Research Conference

The Annual Mary Lou Fulton Mentored Research Conference is a full day event designed to showcase mentored student learning. It is an opportunity for students to present and explain their research to the public and their peers. The fourth annual conference took place on April 3, 2008, and students from all departments in the College of Family, Home, and Social Sciences were invited to participate. Abstracts of the presenting undergraduate psychology students are featured here in Intuition.

Moral Conception Differences in Early and Late Adolescence

Jason C. Basinger, Sam A. Hardy, & Lawrence J. Walker
Mentor: Sam A. Hardy, PhD

Abstract: In recent years scholars have argued for the importance of greater understanding of lay or naturalistic conceptions of moral maturity (Walker & Pitts, 1998). However, given the limited work done thus far in this area, we still know very little about how these conceptions of morality develop. Further, most prior studies of lay conceptions of morality have involved adults (e.g., Smith, Smith, & Christopher, 2007; Walker & Pitts, 1998). Thus, the purpose of the present study was to explore age differences in naturalistic conceptions of morality between early and late adolescents. Using cluster analysis we identified four moral person trait clusters for early adolescents and five clusters for late adolescents.

Use of Cognitive Screening Tests to Identify Cognitive Impairments in Survivors of Critical Illness

Callie J. Beck, Fu L. Woon, MA , and Ramona O. Hopkins, PhD
Mentor: Ramona O. Hopkins, PhD

Abstract: Research has consistently demonstrated volume loss in temporal lobe structures, including the hippocampus, following moderate-to-severe traumatic brain injury (TBI). However, the relationship between the entorhinal cortex (EC), a structure with direct hippocampal input, and volume changes following TBI has not been specifically examined in children. This study was conducted to investigate the role of EC volume loss as it relates to cognitive outcomes in children who have suffered TBI. Quantitative magnetic resonance image analysis was used to measure EC volumes in 16 children with TBI and 16 demographically matched controls. Other temporal lobe structures were also measured to examine volumetric relationships. Cognitive outcomes were also analyzed. EC volume was significantly reduced in children with TBI in relation to the control group, and strongly correlated with hippocampal volume. Children with TBI also showed a significant relationship between aspects of cognitive functioning and EC volume. As hypothesized, EC volume loss occurred following moderate-to-severe TBI. This was correlated with other temporal lobe structures and cognitive functioning.

Increase in Female Hispanic Names and Hispanic Population of California

Bruce Brown PhD, Brian Larsen
Mentor: Bruce Brown, PhD

Abstract: This study uses principle component analysis and multivariate graphics to describe patterns in the popularity of with internal comparison of Hispanic female names of the 20th century in California, based on their frequency. The top 100 baby names per year from 1960 to 2007 were obtained from http://www.socialsecurity.gov/OACT/babynames/. Name frequency data was transformed logarithmically before cluster analyzing. Twenty-eight clusters were identified and compared using profile plots. The clusters were also compared holistically using...
principle component plots, and the number of Hispanic names in each cluster was identified. While comparing the frequency distribution of names, graphed as the logarithm of name popularity against year, we can better understand the pattern and frequency of Hispanic names, and how they have changed throughout the last half of the 20th century. Hispanic names have drastically increased in frequency within the last 47 years in California.

**Women and Eating: Cognitive Dissonance versus Self-Perception Theory**

Brennan Atherton, Karen Call, Kathryn Huff  
Mentor: Patrick Steffen, PhD

**Abstract:** Discrepancies exist between eating attitudes and eating habits in women, leading to poor health. Two explanations are possible: cognitive dissonance or self-perception. A sample of 129 female undergraduates (average age 20.5) was taken to see if what they ate affected their attitude towards food or body image. Participants were divided into three groups. One group was given healthy food, one was given junk food, and the other no food. After eating, the participants completed the EAT and the BIS. There was no difference between groups on the BIS (p=0.60). The healthy food group scored significantly lower on the EAT (p<0.05), suggesting that cognitive dissonance is the explanation for the discrepancy as participants had prior eating attitudes, assessed using questions about the food pyramid. Implications include the possibility of healthier eating attitudes and behaviors by making healthy food more available.

**Effects of Relevant Social Comparisons on Students' Level of Depression**

Adrien Carrillo, Aubrey Dillistone, Maya Inoue, and Bobbi Sue Padro

**Abstract:** Utah was recently ranked as the most depressed state in the country. A previous study shows that social interactions can affect one's perceptions about themselves. Therefore, in areas where people with the same belief or values interact frequently, a norm exists of similar expectations or standards. The purpose of this study was to see the effect on participant's level of depression after watching either upward or downward social comparisons in a video regarding the average Brigham Young University student. Depression was measured by the Beck Depression Inventory. No significant results were found but trends were similar to the hypothesis.
2010 SUBMISSION GUIDELINES

Call for submissions for the Fall 2010 issue of
Intuition: BYU Undergraduate Journal of Psychology

Submissions must adhere to the following guidelines:

• The author (or first author) must be an undergraduate psychology major/minor at a BYU campus during the time he or she wrote the submitted work.
• Articles submitted for publication cannot have been accepted for publication elsewhere.
• Articles must be at least 1,000 words in length and must conform to APA style.
• An electronic copy of all articles must be submitted (see below for further directions). Preferred format for the electronic copy is Microsoft Word. All graphics or photos must be of high resolution (300 dpi).

Types of submissions

• Brief and extended reports of theoretical development or original research (or both). We accept submissions from any field of study in psychology.
• Creative works (visual media for potential cover art, and personal narratives related to research experience).
• Topical reviews, book reviews, and essays (reviews must be of recent publication and noteworthy).

Important Information

• Submissions are accepted and processed year-round. The submission deadline for the Fall 2010 volume is January 15, 2010.
• Those who wish to submit manuscripts, reviews, or creative works to be considered for publication should send an e-mail, with an electronic copy of their work attached, to byupsychjournal@gmail.com with the subject line: 2010 SUBMISSION: TITLE OF WORK
• Submissions will undergo a basic process of revision before an offer of acceptance is extended.
• If your submission is accepted, you will be expected to work in collaboration with our editorial board. Publication in the journal is ultimately contingent upon your willingness to contribute to the revising and polishing of your own work.
• Any questions, comments, or concerns should be directed to the Editor-in-Chief at byupsychjournal@gmail.com

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