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Selection process

The August 2015 issue of the *International Journal of Interdisciplinary Research (IJIR)* has been the result of a rigorous process in two stages:

- Stage 1: all papers that were submitted to the 2015 IABD conference went through blind reviews, and high quality papers were recommended for presentation at the conference.
- Stage 2: approximately ten percent of the articles which were presented at the conference and one invited manuscripts (originally reviewed by the Chief Editor) were selected for possible publication in *IJIR*, and the respective authors were contacted and asked to resubmit their papers for a second round of reviews. These manuscripts went through a rigorous blind-review process by the editorial board members and external reviewers. In the end, three articles were recommended for publication in the August issue of *IJIR*.

IJIR is listed in *Cabell's* Directory of peer-reviewed publications. The Editorial Board members are committed to maintaining high standards of quality in all manuscripts published in *International Journal of Interdisciplinary Research*.

Ahmad Tootoonchi, Chief Editor

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THE VIRAL GAP

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ABSTRACT

This article explores word-of-mouth communication and the gap that exists between viral content or buzz that is generated by communication professionals and its intended return on investment. This research begins with an analysis of Super Bowl commercials from 2015 to determine the extent to which the ads created buzz and the amount of sales they produced then discusses other metrics utilized to analyze the effectiveness of these ads. While Super Bowls ads are the subject of this study, this model can be used to evaluate this so-called "viral gap" in a variety of contexts. The purpose of this research is to better understand this relationship, increase awareness among communication professionals, and improve the effectiveness of communication.

INTRODUCTION

I've always been curious about what people talk about and how ideas spread, and every year there is one topic that gets more people talking than most any other: Super Bowl ads. In fact, many people watch the Super Bowl for the ads as much as, or even more than, the game itself. Therefore, I wanted to understand to what extent people talked about the ads and the degree to which they influenced their behavior.

In the process, we'll also discuss previously successful Super Bowl ads and analyze their content to determine their essential elements. This analysis will include strategies and tactics used in the development of the ads themselves and those used to enhance their word-of-mouth marketing. As we'll see, word-of-mouth marketing remains an essential part of these campaigns but how it is integrated plays a critical role in the success of these ads.

METHODOLOGY

I conducted a survey of Super Bowl viewers in February 2015 with the assistance of the Emerson College Polling Society (ECPS) to analyze the relationship between word-of-mouth and sales in this advertising context. This survey was conducted using an online panel February 13-14, 2015, about two weeks after the game. The sample consisted of 395 respondents and was weighted for

accuracy. In addition to exploring this relationship, the following discussion will also include other metrics used to evaluate the effectiveness of these ads.

DISCUSSION

The ECPS survey revealed a number of interesting things about Super Bowl ads. It primarily revealed that many Super Bowl advertisers might be "fishing without a hook." That is, the ads generated significant buzz with 84.3 percent of viewers saying they talked about the ads with family and friends. However, the survey found that only 5.5 percent of viewers actually purchased products based on the ads. Thus, even though many of the ads were creative and entertaining, just generating buzz and viral content wasn't enough to drive sales.

It's true that generating buzz is valuable in itself, especially for new products. For example, only 0.8 percent of viewers said that they would make a purchasing decision based on an ad alone. This is because most people would consult others before buying a new product. To wit, 13.6 percent of people said that they would first consult a family member, friend or someone who was familiar with the product before making a purchase. The figure rose to 56.4 percent for those who said they would consult someone else depending on the product type. After all, some purchasing decisions are more complex than others.

Moreover, 49.2 percent of viewers said that they were much more or somewhat more likely to consult others first before purchasing a new product. These results support the Diffusion of Innovations model, which states that diffusion is primarily a social process and follows a predictable curve. This diffusion curve, shown in Exhibit 1, illustrates levels of innovativeness. This is defined as the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system (Rogers, 2003).

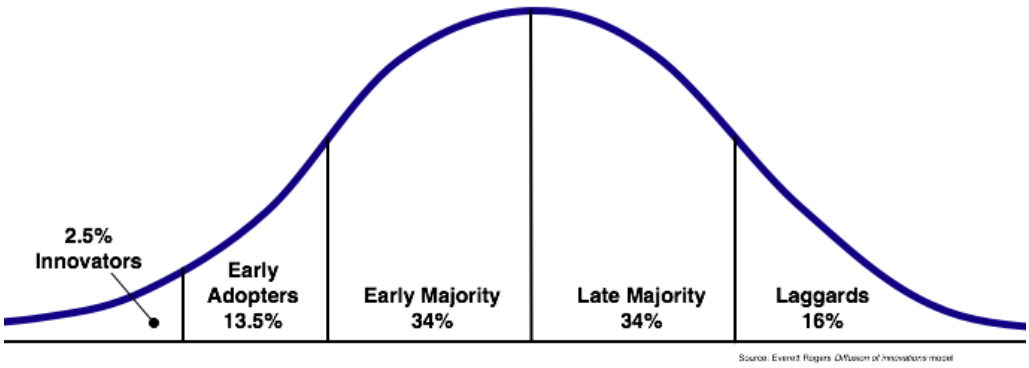

FIGURE 1: DIFFUSION CURVE

Everett Rogers, who developed the Diffusion of Innovations theory, characterized innovators and early adopters as opinion leaders and argued that reaching this group constituted a critical mass due to their influence (2003). According to Rogers (2003), opinion leaders are those people who either are respected for their opinions on one subject (i.e., monomorphic) or are generally respected for their opinions on a variety of subjects (i.e., polymorphic). The latter group can be

also thought of as influentials, as described by Jon Berry and Ed Keller (2003). In their book *The Influentials* (2003), these authors explore how this group of individuals influences the voting and purchasing decisions of others.

Moreover, Rogers argued that it was after reaching this group of opinion leaders that ideas spread epidemically (2003). Malcolm Gladwell referred to this point between early adopters and the early majority as the "tipping point" and wrote about the factors that facilitated these conditions in his book by the same name (2002). In addition to Malcolm Gladwell's book, *Made to Stick* by Chip and Dan Heath (2007) expands on some of the concepts in *The Tipping Point*, and *Start with Why* (Sinek, 2009) explores the influence of emotional appeals in this process.

Geoffrey Moore (2002) elaborated on this concept in his book *Crossing the Chasm*, which uses this model to market disruptive innovations. In fact, Apple's "1984" ad, widely considered as the best Super Bowl commercial of all time, introduced a disruptive innovation. This ad launched the Macintosh computer and was directed by Ridley Scott, the director of *Alien* (1979) and *Blade Runner* (1982). Not only did the ad generate incredible buzz and extensive earned media coverage, it would lead to $155 million in sales within three months (Taube, 2014).

The "1984" ad was clearly effective, but many consumers likely consulted opinion leaders before purchasing this product as the ad said little about the computer. Nevertheless, despite the value of buzz, it's safe to assume that simply creating viral content is not the goal of Super Bowl advertisers. And, given our survey results, these ads may seem like an expensive and risky proposition, especially at a reported $4.5 million a spot—even though the Super Bowl was estimated to draw an average audience of 114.4 million viewers according to NBC (CNNMoney, 2015). An audience of that size equates to a cost of 4 cents per viewer, so if your ads work, it's easy to realize a good return on investment. However, because the success of ads such as "1984" is so elusive, this challenge continues to be the subject of research and debate.

For instance, a study by BrandAds in 2014 found that the average Super Bowl ad increased the likelihood of viewers' purchasing decisions by 6.6 percent. Another Stanford University study found that one of the primary benefits of Super Bowl advertising is that people build associations between certain brands and sporting events (Stanford Report, 2015). This is why consumers may prefer a Budweiser while watching sports and a Corona while relaxing on the beach. This same study also found that Budweiser realizes huge returns on their investment based on store level sales data (Stanford Report, 2015). This is most likely due to Budweiser's exclusive advertising rights which they've purchased for more than 20 years. Additionally, when two competitors advertise in the Super Bowl, such as Coke and Pepsi, it has been found that their gains are offset (Stanford Report, 2015).

Nevertheless, some argue that these dollars could be better spent on other forms of advertising with a better return on investment. Among the alternatives, Jack Marshall (2014) from Digiday points out that $4 million could buy 14 billion Facebook ads and 3 billion banner ads. Furthermore, Ira Kalb, a marketing professor from the Marshall School of Business at the University of Southern California, argues that most spending on Super Bowl ads is wasted and offers a quote from David Ogilvy to emphasize this point, saying that "if it doesn't sell, it isn't creative" (Kalb, 2015).

When discussing these results with my students, they are quick to point out that there are other ways in which these ads create value. This is certainly true and other methods have been used to analyze the strategies employed by companies and the effectiveness of their ads. In fact, there are several other metrics out there to assist observers in this effort.

For instance, Lauren Streib, a reporter for *The Daily Beast*, analyzed the most effective Super Bowl ads using three metrics. The first was *USA Today's* Ad Meter to assess an ad's likeability. The second was the Super Bowl Advertising Review, developed by the Kellogg School of Management at Northwestern University, which evaluates ads based on their ADPLAN framework for attention, distinction, positioning, linkage, amplification, and net equity. And the third was the change in stock price between the day before the Super Bowl and the average stock price a month later (Streib, 2013).

Each of these approaches, like mine, evaluates different variables, but also presents challenges for quantifying the effectiveness of these ads. First, in regard to *USA Today's* Ad Meter, there may be correlations between an ad's likeability and purchasing decisions. However, likeability certainly isn't a substitute for return on investment. As an example, in my survey I asked people what their favorite ad was. By far, people's favorite was Budweiser's "Lost Dog" ad at 38.6 percent followed by Always' "Like a Girl" ad at 15.3 percent. These were the top two ads for *USA Today's* Ad Meter as well (USA Today, 2015). However, only 5.5 percent of viewers purchased products based on the ads. Therefore, likability could serve as a factor of but not a proxy for effectiveness.

The ADPLAN framework includes broader measures such as attention, which determines the extent to which an ad engages an audience; distinction, which assesses whether the execution is unique in its delivery; positioning, which asks whether the appropriate category is represented and how the brand differentiates itself; linkage, which evaluates whether the brand and benefit will be remembered; amplification, to assess whether the ad creates a favorable impression of the brand; and net equity, to determine whether the ad is consistent with the brand's history and reputation (Kellogg, 2015).

This framework was developed in 2005 by marketing professor Tim Calkins (Schmitt, 2014). Each year, Calkins and colleague Derek Rucker select 40-50 students to serve on a panel to evaluate Super Bowl ads during the game using the 6 elements of the framework. After the grades are recorded, Calkins discards the top 5 percent and the bottom 5 percent, and averages the remainder (Schmitt, 2014). Once the rankings are revealed, the students debate the merits of the ads. All of the elements of the ADPLAN framework are valuable. However, strategic positioning and brand reputation are critical features of ads that are likely not typically evaluated. Therefore, the purpose of this exercise is to get MBA students to think like advertising executives (Schmitt, 2014).

Lastly, there are a number of variables that can contribute to stock price performance. Exhibits 2 and 3 show three-month comparisons for both Budweiser's parent company Anheuser-Busch InBev and Always' parent company Procter & Gamble, Inc. (MarketWatch, 2015). One of the challenges with this indicator is the number of brands represented by the stock price. Budweiser's stock price includes several other brands of beer including Bass, Beck's,

Boddingtons, Busch, Michelob, Rolling Rock and Stella Artois (Anheuser-Busch, 2015). Always' stock price also includes multiple products in different categories including 22 other billion-dollar brands (Procter & Gamble, 2015).

Moreover, using stock price as an indicator of effectiveness is problematic for another reason. The exhibits show the stock prices of Anheuser-Busch InBev and Procter & Gamble compared to the S&P 500 index. As you can see, Anheuser-Busch InBev's stock price is shown to increase and outperform the index while Procter & Gamble's stock price is shown to decrease and underperform the index despite the popularity of both the Budweiser and Always ads.

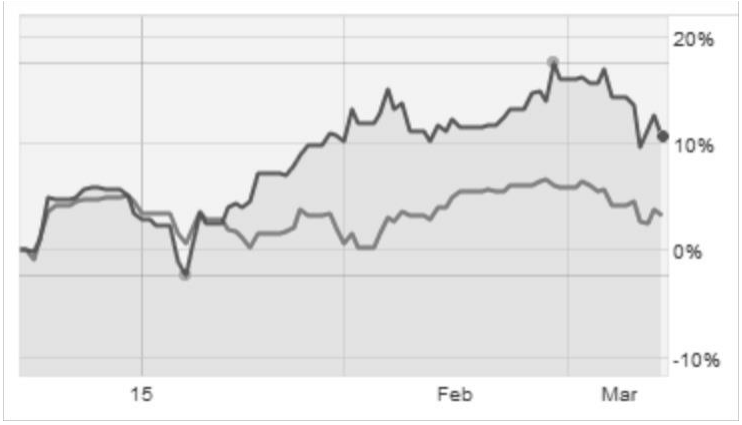

FIGURE 2: ANHEUSER-BUSCH INBEV N.V.
ADR STOCK PRICE (BLACK) V. S&P 500 (GREY)

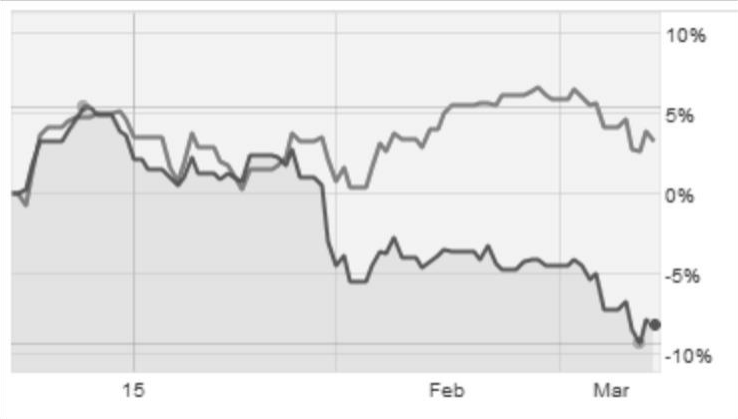

FIGURE 3: PROCTER & GAMBLE CO.
STOCK PRICE (BLACK) V. S&P 500 (GREY)

WORD-OF-MOUTH MARKETING

There is nothing more effective than word-of-mouth marketing. In fact, a study by Nielsen (2013) found that 84 percent of consumers from around the world trusted word-of-mouth recommendations from friends and family more than other forms of advertising. The second

most trusted form of advertising, at 69 percent, was owned advertising which consisted of content and messaging on brand websites. The third was consumers' opinions posted online at 68 percent. But the study also found that television ads were still an influential form of advertising, with 62 percent of respondents saying they trusted the format (Nielsen, 2013).

In light of these findings, it makes sense that companies would want to capitalize on both the influence of television ads and word-of-mouth marketing with their Super Bowl commercials. However, even though it is in companies' best interest to generate buzz around their ads, it wasn't conventional to prerelease ads that were meant to air during the Super Bowl until Volkswagen's ad agency Deutsch decided to do so in 2011. Though Deutsch considered this a risk, they felt it was a way to differentiate itself from other larger automakers.

So, on the Wednesday before the Super Bowl, Deutsch released an ad online called "The Force," which featured a little boy dressed as Darth Vader who tried to use his powers on everything from the family dog to the new Passat. By Thursday morning at 8:00 am the ad had been viewed 1.8 million times and would be viewed 17 million times before the game even began (Sanburn, 2015). According to Unruly, a company that analyzes viral videos, the ad was the most shared of all time after its launch and remains the most shared Super Bowl ad (Sanburn, 2015).

But the big question is whether this buzz translated into sales for the company. A good indication is that as of December of that year, sales had more than doubled for the car (Associated Press, 2012). However, as we've discussed, simply creating a viral video doesn't guarantee success. For instance, in 2009, Evian's "Roller Babies" video garnered more than 55 million views but the company subsequently lost market share and sales dropped by 25 percent in the US (Berger, 2013).

So how do companies close this viral gap? That is, how can companies create what Wharton business school professor Jonah Berger describes as "valuable virality" (2013)? Let's start this analysis by looking at what type of information people share.

First, one of people's favorite topics is themselves. For instance, research has shown that 30-40 percent of everyday speech consists of conveying information about ourselves. Moreover, this figure rises to more than 80 percent on social media (Tamir & Mitchell, 2012).

But why is sharing information about ourselves so prevalent? Researchers at Harvard have found that sharing information about ourselves—such as our thoughts and experiences—is intrinsically rewarding. That is, this type of self-disclosure activates the rewards and pleasure system of the brain and increases the production of a chemical called dopamine which is also heightened by sex and good food (Walker, 2013). This might lead you to ask: what types of things are people most likely to share? Research suggests that people share things that enhance their self-concept. Berger (2013) describes this principle as *social currency* and simply defines it as things that make us look good.

This propensity to share things that make us look good via social media is becoming increasingly apparent, even to the casual observer, and has become a common subject of research. For instance, several studies have found links between social media and adverse mental health

consequences precisely because of the skewed representations of our lives and our tendencies towards the well-known phenomenon of social comparison (Walton, 2015).

In addition, Berger has extensively studied the social transmission of ideas and identified six principles behind the spread of viral content in his book *Contagious: Why Things Catch On* (2013). Moreover, he created an acronym called STEPPS to represent these principles. They are social currency, triggers, emotion, public, practical value, and stories (Berger, 2013).

In regard to social currency, Berger (2013) recommends that companies should find a way to make people look good while promoting their ideas, products, or services along the way. He suggests that this can be achieved in three ways. The first way is to find the inner remarkability of an idea, product or service; that is, something about it that is unusual or extraordinary. As an example, Berger uses the Blendtec "Will It Blend?" series of videos in which various types of items such as an iPhone are blended to demonstrate its power (Berger, 2013).

The second way to build social currency is to leverage game mechanics (Berger, 2013). Frequent flier programs are good examples of game mechanics because they reward us while motivating us to achieve a certain level of prestige compared to others. The third way is to make people feel like insiders. The website Rue La La, which offered discount high-end designer goods, became extremely successful by offering "flash sales" to its members. The catch was that access to the site was by invitation only and you had to be invited by an existing member (Berger, 2013).

The next principle of contagiousness involves triggers. This simply means that things that remind us of other things can affect behavior. For instance, Berger and other researchers found that a polling location could influence how people vote. Specifically, people who voted in a school were more inclined to vote for an increase in the sales tax to support funding for public schools. On the commercial front, the success of Hershey's "Kit Kat and Coffee" advertising campaign was partially due to linking the candy bar with coffee, a frequent stimulus in the environment (Berger, 2013).

Further, the use of emotion certainly inspires sharing. This is especially true for emotions that spark physiological arousal. This occurs when what we experience manifests itself in our readiness for action. This can be from both positive and negative emotions with high arousal values. Positive high arousal values include awe, excitement, and amusement, while negative high arousal values include anger and anxiety. One of the best examples of an awe-inspiring video that went viral is Susan Boyle's appearance on *Britain's Got Talent* (Berger, 2013).

The principle of *public* refers to making our ideas, products or services easy to observe (Berger, 2013). This helps increase awareness and facilitates imitation through social proof. The concept of social proof can be described as instances when people look to others for social cues on appropriate behavior. For example, each November, the Movember Foundation—which is dedicated to improving men's health—encourages its male donors to grow moustaches to raise awareness and money for the organization. As a result, much of their success is attributed to their ability to make the private public (Berger, 2013).

When it comes to practical value, we need to be able to highlight the incredible value of an idea, product or service. People genuinely enjoy helping others by sharing information that saves them time and money, improves their quality of life, and provides them with useful advice. That's why a video about a farmer shucking corn garnered millions of views. But practical value also involves knowing how people perceive and process information (Berger, 2013).

To illustrate, prospect theory, also known as loss aversion theory, can influence people's choices in a variety of ways (Berger, 2013). The central premise of this theory is that people have a greater aversion to losses than they have a penchant for gains. But the theory also argues that people tend to evaluate things from a comparison standard or reference point (Berger, 2013).

This reference point can have a significant influence on purchase decisions. In fact, people are more influenced by the size of a discount than they are by the price of an item (Berger, 2013). That is, if people see two identical items for the same price, they are more likely to buy the item that has a greater discount. Research has even found that marking items as on sale without a comparative price has an influence on purchasing behavior (Berger, 2013).

Finally, we need to develop a story around our idea, product or service. Ideally, this narrative is not about the product but is one in which the product is imbedded. Dove's "Campaign for Real Beauty" included an ad called "Evolution" which showed what a model looked like before all the makeup and use of Photoshop. This ad sparked numerous conversations about unrealistic beauty standards and about Dove in the process (Berger, 2013).

The Dove ad is instructive for another reason, too. When developing your narrative, you need to be sure that the story is relevant to whatever it is you're trying to promote. That is, you need to create valuable virality that translates into results you can measure. After all, you want to be part of the conversation that ensues (Berger, 2013).

Using the STEPPS framework, we can understand how "The Force" created valuable virality and became the most shared Super Bowl ad of all time. First, talking about the ad likely made people look good. And, as we now know, this act likely stimulated the production of dopamine and, as a result, likely made people feel good as well. Second, this ad certainly used emotion as you couldn't help but share the little boy's excitement at his success, albeit manufactured. Third, the ad created a narrative in which the product was relevant. That is, you couldn't talk about the ad without mentioning the product.

OTHER VIRAL SUCCESSES

"The Force" may be the most shared Super Bowl ad, but there have been other very successful viral videos (Sloane, 2015). Perhaps the most successful viral video in terms of return on investment was the ALS Ice Bucket Challenge. In fact, Facebook recently named this campaign the most successful marketing campaign of 2014. This campaign resulted in 17 million videos from 159 countries, generated 70 billion video views and raised $220 million. Meanwhile, the ALS Association spent zero dollars to promote the campaign on Facebook (Sloane, 2015).

In regard to the diffusion of this meme, data scientists mapped the spread of this viral activity and found that most of the spread centered from Boston (Perez, 2014). This is thought to be because the challenge is credited to former Boston College baseball player Pete Frates, who was diagnosed with ALS in 2012 (O'Connor, 2014).

It's interesting to note that the "Like a Girl" campaign was also included among the Facebook winners in 2014. As mentioned earlier, the "Like a Girl" ad was the second favorite ad according to both my survey and the *USA Today* Ad Meter behind Budweiser's "Lost Dog" ad. The "Like a Girl" ad generated 76 million views globally, the most of any Procter & Gamble ad (Sloane, 2015). It also enhanced top-of-mind awareness by 9 percentage points to 58 percent and increased purchase intent among teens from 40 percent to 60 percent (Sloane, 2015).

However, the "Like a Girl" ad was remarkable in another way as well. The ad's intent wasn't only to promote the Always brand. It was also intended to address an issue that was discovered in the company's consumer research—namely that girls' self-confidence drops significantly during puberty (Berman, 2015). This kind of message, therefore, has intrinsic value that is difficult to measure. That is, boosting a young girl's self-esteem has an immeasurable impact, one that provides a lifetime of benefits. In addition, supporting this type of cause also improves the brand reputation of a company. And, though brand reputation is also difficult to quantify, executives estimate that about 60% of their company's value is attributable to reputation (Weber Shandwick, 2012).

Dove's "Real Beauty" campaign, which celebrated its 10th anniversary in 2014, was based on a similar premise. This campaign originated from a survey conducted by Edelman of more than 3,000 women in 10 countries (Bahadur, 2014). One of their key findings was that only 2 percent of the women surveyed considered themselves beautiful. Two videos from this campaign ended up going viral. The first ad, which was described earlier, was "Evolution" in 2006. The second was "Real Beauty Sketches" in 2013. This ad consisted of contrasting women's perceptions of themselves with others' perceptions of them via a forensic sketch artist. Though both ads went viral, the latter became the most watched ad within a month of its launch (Bahadur, 2014).

Ironically, "Real Beauty Sketches" replaced Evian's "Roller Babies" video as the most viewed online ad (Murphy Kelly, 2013). As we discussed, despite the viral success of this ad, Evian lost market share and sales in its wake. In contrast, though Dove doesn't release sales figures, executives at its parent company Unilever suggest the "Real Beauty" campaign increased sales (Bahadur, 2014).

In addition to guarding against people simply talking about your ad for its entertainment value, you also want to avoid people talking about your ad for the wrong reasons. Nationwide's "Make Safe Happen" ad this year featured a young boy citing all of the events in his life he will never experience because he died in an accident. The ad sparked immediate criticism on social media and was even the subject of late night talk show jokes (Alter, 2015). However, the company responded that the purpose of the ad was to get people to talk about accidents as they are the primary cause of death for children according to the Centers for Disease Control and Prevention (CDC). In fact, the CDC estimates that about 9,000 children die in accidents per year, which is about one per hour (Alter, 2015).

We didn't measure the extent to which people talked about this ad but it was likely significant. However, even though the ad sparked controversy, it could have changed behavior and had a positive impact on the company. Although we'll have to wait and see, we have to believe that the company anticipated this type of response. In any event, even if metrics from the ad don't emerge, any conversation about this topic is valuable in and of itself.

The purpose of mentioning this ad is to shed some light on the risks involved when presenting issues in a provocative way. Ideally, these ads should be tested ahead of time with a focus group to explore these boundaries and ensure that their messages have the intended effect.

ACADEMIC EXERCISE

If you're a teacher, analyzing Super Bowl ads is a great way to study viral marketing and how ideas spread. However, if you don't have the resources to conduct a national survey, I've developed an academic exercise to explore these issues. Specifically, this exercise allows students to reflect not only on which ads work but also how they work. This activity simply consists of a survey that can be administered to your students either online via Survey Monkey or via a hard copy that they can fill out in class or on their own time.

First, I would recommend a survey question that asked to what extent the students talked about the ads with family and friends. This question will let you know the degree to which the ads generated buzz. It doesn't matter whether they discussed the ads before, during or after the game—only whether they talked about them. Again, our national survey showed that 84.3 percent of viewers talked about the ads with family and friends.

Next, I would ask them several questions to determine whether the ads worked by themselves or whether they followed a diffusion curve. For instance, I would ask the students if they would make a purchasing decision based on any of the ads alone or if they would consult with a family member, friend, or someone they know who is familiar with that product. I would then ask them if they would be more likely to consult a family member, friend, or someone they know before purchasing a new product.

The next series of questions pertains to actual or intended purchasing decisions. That is, ask them if they either purchased or intended to purchase any of the products featured in the ads. If they did, ask them if they made this decision based on the ad alone or whether they consulted someone else first. Then ask them if this decision was for a new product.

I would also ask them their favorite ad with an open-ended question. I would then ask them why it was their favorite ad. That is, I would ask them if it was because the ad had a strong emotional appeal or whether it was funny, creative, entertaining, or persuasive. You'll likely find that most people's favorite ads are due to their emotional appeal or because they found them funny. You'll also likely find that this may result in more purchasing or intent-to-purchase decisions but that's not always the case.

Once the surveys are tabulated, engage your students in a discussion about their results. Even though the results may not be statistically reliable in a quantifiable sense, they will offer valuable qualitative insights. In fact, you'll likely be able to discover information that wouldn't be revealed by a purely quantifiable approach.

First, what percentage of students talked about the ads? Why did they talk about them? What prompted them to talk about them? Was it based on the content itself or were there triggers in the environment? Next, what was the percentage of people who said they would make a purchasing decision based on any of the ads alone? How many would first consult someone else? Of the people who said they would make a decision based on the ad alone, are they considered opinion leaders? If they are opinion leaders, are they monomorphic or polymorphic? Then, of those people who said that they would first consult someone else before making a purchasing decision, how would you assess their levels of innovativeness? Are they innovators, early adopters, early majority, late majority, or laggards?

Further, did the type of product affect whether people first consulted others? For instance, did it matter whether the product was new or familiar? Are people more likely to consult others for new products? Did it matter how disruptive the innovation was? What impact do ads have for established brands? Did the level of complexity in the purchasing decision matter? What other variables might affect the effectiveness of the ads and purchasing decisions?

Students tend to agree that the diffusion curve is most applicable for new products and especially disruptive innovations. That is, very few of them would purchase a new product before consulting someone else whose opinion they respected. However, there are exceptions based on the level of complexity of the product and their level of familiarity with the product. In the end, students find this an extremely useful exercise for helping them to think critically about how ideas spread and the role of this communication channel in the innovation decision process. This exercise also serves as a good segue for a discussion on how to reach your tipping point.

Alternatively, you could also develop an exercise to evaluate the marketing strategies of the companies that produce Super Bowl ads. To that end, Advertising Age provides an Ad Chart on all of the marketers and their creative plans. This includes details on the advertising buy, the agency, and pre-release activities (Ad Age Staff, 2015).

With this information, you could take a bigger-picture approach and have the students assume they are executives in these companies. For example, students could back up and first examine the strategies of these companies, research their competitors, their key differentiators, and their target customers. They could then decide whether advertising is worth the return on investment or if another marketing strategy is worth consideration.

If they determine that the Super Bowl strategy is worth pursuing, ask them if they would replicate the same type of ad or if they would develop a different message. If they recommend a different message, have them present their recommendations and rationale for their classmates to discuss and evaluate.

As a third option, you could combine these two activities. That is, you could have your students both analyze the marketing strategies of the companies and the ads they develop. In the process, they could develop their own framework to assess each company's marketing plan, assess their ads and monitor the success of the ads over a longer term to gauge their effectiveness.

Again, ultimately determining the success of these ads is challenging without access to sales figures. As a result, you may have to rely on whether some companies report this data. In the absence of these reports, revenue and market share can also be good indicators.

CONCLUSION

Apple's "1984" ad remains the Holy Grail for Super Bowl advertisers. However, this aspiration may be a bit unrealistic since this revolutionary ad introduced a revolutionary product. Despite Budweiser's Super Bowl success, not every company can negotiate exclusive advertising rights. Nonetheless, Volkswagen's "The Force" became the most shared Super Bowl ad of its year and Always' "Like a Girl" was among Facebook's most successful marketing campaigns of 2014. Each of these ads offers insights into the elements of a successful campaign. Moreover, each of the metrics and frameworks we've discussed enables advertisers to develop ads that serve their individual needs.

That is, Northwestern University's ADPLAN framework and Berger's STEPPS model could be used to evaluate the strategic positioning of your product and enhance its viral marketing. However, if you're launching a new product, you might decide that based on the diffusion curve your marketing dollars would be better spent on first reaching opinion leaders in your industry. Or, you might decide that there are other marketing methods such as Facebook advertising that would generate a higher return on investment. As another alternative, you might want to incorporate a social cause that enhances your company's brand reputation. Always' "Like a Girl" and Dove's "Real Beauty Sketches" are testaments to the power of these campaigns.

The purpose of this study was to understand the relationship and quantify the gap between an ad's virality and purchasing decisions. Though there are a number of ways to evaluate an ad's value beyond sales, purchasing decisions are clearly a valuable metric. And, while actual sales data for individual products can typically only be assessed by ad sponsors, the aggregate numbers presented in this study are intended to shed light on this viral gap. There's no question that generating buzz around a product has its own worth. However, there's also no question that reducing this viral gap provides added value.

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USING STUDENT CASE STUDY RESEARCH TO VERIFY TWITTER USAGE IN DISASTERS

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ABSTRACT

In disaster situations, Twitter has become a preferred means of transmitting information to the news media and the public. This study examines the inter-relationship among the various parties who share and produce information in a disaster situation. Student case studies of disaster situations serve as the primary database for analysis. A preliminary examination of the case studies and the Twitter trails of information seems to support the view that Twitter can be a source of gathering and relaying information in a disaster situation, and that first-responder agencies, the media, and the informed public can use Twitter for information they can use in decision-making.

INTRODUCTION

While traditional media still play an important role in covering disasters and other emergencies, more and more people are going directly to the source through social media to keep informed and to protect themselves. Joe Dougherty, the PIO for the Utah Division of Emergency Management, says the job of the Public Information Officer (PIO) is "to get the right information at the right time to the right people so they can make the right decisions." Sometimes, he says, the best way to do this is through social media (Dougherty, 2013).

When Hurricane Katrina hit the shores of Louisiana and Mississippi in 2005, Facebook was just getting started and Twitter didn't exist. Now, FEMA has a Twitter account with nearly 400,000 followers and FEMA director Craig Fugate has his own page, @CraigatFEMA, with over 50,000 followers. The U.S. Department of Homeland Security (HSD) indicated in the 2013 National Preparedness report that during and immediately following Hurricane Sandy, "users sent more than 20 million Sandy-related Twitter posts, or 'tweets,' despite the loss of cell phone service during the peak of the storm." New Jersey's largest utility company, PSE&G, reported that

during Sandy they used Twitter to notify the public of the daily locations of their giant tents and generators.

As reported by the Pew Research Center (2013), one quarter of Americans looked for news about the Boston Marathon bombings on Facebook, Twitter, and other social media. When the Boston Police Department posted its "CAPTURED!!!" tweet, more than 140,000 people retweeted it. The Boston community set up a Google document offering lodging, food, or a hot shower when roads and hotels were closed. Google's Person Finder, developed in previous natural disasters, was used to track lost family and friends.

This study examines the inter-relationship among the various parties who share and produce information in a disaster situation. Student case studies of disaster situations serve as the primary database for analysis. The study question was: What can be learned from student produced case studies based on Twitter feeds to help emergency managers and public officials in making decisions about disaster response?

LITERATURE REVIEW

Social media can be an effective disaster tool if it is part of preparedness planning, disaster sociologist Jeannette Sutton told *Scientific American* (Maron, 2013). A senior researcher at the University of Colorado at Colorado Springs, she studies social media in crises and disaster. For the Boston Marathon incident, she found no consistent hashtag on Twitter, making it hard to track pertinent information. A search for the word "Boston" was problematic, she says, because it led to unrelated information like Boston tourism. As part of disaster preparedness, she says, it would be useful to teach the public how to use social media to get information from the Web and also what kind of information would be useful to post. "Tweets flow so quickly it's like a fire hose where you're trying to extract bits of information that are relevant" (Maron, 2013).

Inherent risks exist in using social media. One is misinformation. Sutton (as cited in Maron, 2013) claims that "all the fast-paced information available via social media does pose inherent risks when navigating emergency situations." Although false information eventually gets corrected by the "Wikipedia effect," Sutton notes that inaccuracies can also go viral. Rumor Control, run by FEMA, relies on local emergency personnel to correct misinformation. Another risk is fraud. The American Red Cross used cell phone technology to raise more than $5 million in the 48 hours following the Haiti earthquake in 2010, but at the same time cell phone texting and webpages were used by criminals who appealed to emotion to steal cash (Maron, 2013). After the Newtown, Connecticut, school shooting, the FBI arrested a woman who claimed to be the relative of a dead victim and solicited money via Facebook and other sources.

Utah State emergency management department PIO Joe Dougherty (2013) was interviewed for a video for ESMG 4200 *Disaster Response and the Public* about the use of social media in disasters. By far the fastest and most effective means of reaching the public, he says, is Twitter. While all the public doesn't use social media, most listen to the radio or watch television during a disaster. Every news organization and journalist is on Twitter and they follow local emergency

service agencies. When they get information from a trusted source on Twitter, like a fire station chief or a county or municipal PIO, they quickly broadcast the information to the public. Radio is fast but Twitter is even faster, Dougherty says (2013). He tells how Twitter beat the shock waves from the Virginia earthquake to New York City. As soon as people felt the earthquake in Virginia, they tweeted messages about it.

Facebook pages are also easy to set up in a disaster, says Dougherty (2013). However, people have to know a specific Facebook page's address in order to join in the discussion. It is important to plan for social media before a disaster and to get people following agency Twitter and Facebook pages prior to the emergency. If they are following on Twitter, the agency can send out updates and the Facebook page location when the event happens. For example, Facebook was used effectively in Utah's Washington County during the floods of 2010 (Dougherty, 2013). The county posted the location of sandbags. When they ran out at a location, someone let them know on Facebook and they were able to let the public know a new site for sandbags. This all happened very quickly.

Websites are still valuable tools, but are not easily changed. Sometimes they can only be changed by IT people and they may not be available in an emergency situation. A better approach, says Dougherty, is a blog. Blogs can be set up to have information and pictures. The newest information is always on top. Blogs can be updated by email from cell phones so that the public always has the latest information. State and local use of social media was tried out during the Great Utah Shakeout in Spring 2013. People who followed the state Twitter account @UtahShakeOut and the Facebook page at https://www.facebook.com/UtahShakeOut were kept up-to-date throughout the exercise. The state also posted the numbers of people involved in the exercise and the names and social media information for agencies participating in the exercise. Schools, hospitals, and government agencies appreciated the feedback and recognition. (Readers can follow Dougherty's Twitter account @utahemergency by going to http://twitter.com/utahemergency.)

FEMA use of Twitter during Disasters

Since 2010, the Federal Emergency Management Agency (FEMA) has used Twitter during all stages of a disaster, including before the event strikes, during the actual event, and after (Modern Business Associates, 2011). Prior to a disaster, FEMA monitors local weather reports (and tweets) and advises the public. As an example, in the case of floods, FEMA's posts on Twitter outline the parts of the U.S. experiencing flooding, share information about flood preparedness, and give advice to people about what they can do. The agency relies on official information, including forecasts from the National Weather Service and links from official emergency management agencies. FEMA typically re-tweets information from other government agencies. They use a tool to shorten .gov web addresses and can track how many hits each individual link draws.

The agency also uses social media to try to predict what a state might need to do to prepare for a potential disaster. For example, in its first attempts to use social media in September 2010 as

Hurricane Earl moved up the East Coast, by monitoring Twitter, FEMA could see that tourists on the Outer Banks in North Carolina were evacuating, but many residents were not. That gave FEMA and state agencies the information they needed to make search and rescue plans for those residents.

Emergency agencies determine what people are saying by tracking hashtags. In the snow and ice storms in February 2011, the most commonly used hashtag was #snomg. During those storms, FEMA monitored what was happening by using HootSuite, a Twitter-adaptable program that displays all tweets using a given hash tag. During that storm, FEMA could tell Oklahoma was getting hit by ice and Chicago residents thought the storm had missed them—that was until they started tweeting as the storm got worse.

During the summer 2013 Arizona fire that tragically killed 19 wildland firefighters, the emergency officials, the media, and the public followed the event using the hastag #YarnelHillFire. Public officials used Twitter to monitor public comments and provide updates. The media used Twitter to get official updates and follow public opinion as well as to direct their audience to more in-depth coverage. Twitter and other social media also provided people from across the nation and the world a means to share in the grief of the local community. A Twitter message on June 30 summed up the feelings of many first responders: "Never forget that firefighters have a dangerous job. We mourn those killed today. 19. Takes your breath away. #YarnelHillFire" (MichaelB1850).

Twitter as a News Service

Twitter serves also as a news service, not only a social network. This is particularly true where tweeters are victims of the disaster. As eye-witnesses of the harm from the disaster, they become first line reporters of what is happening. A study of the 2009 flooding of the Red River in North Dakota (Starbird, Palen, Hughes, & Vieweg, 2010) showed that 10 percent of tweets were new information. However, much of the valuable information resulted from copying or adapting information from others (derivative information) and combining information (synthesis). The researchers found that fully 80 percent of the information was generated by people living the disaster, with the remainder being generated by the local and national media (Starbird, Palen, Hughes, & Vieweg, 2010). And the majority of information that was retweeted was news because it didn't exist elsewhere or on the Internet.

Another factor that made Twitter unique was that Twitter didn't only serve as a means of broadcasting news, but also as a platform for informational interaction. This provided a way for people to navigate through the enormous amounts of information, placing "virtual signposts" which they could follow. People retweeted information they felt was important, adding to the enormous amount of information out there, but also signaling to their followers that this was information they needed to pay attention to. Tweeters use retweeting, copying or adapting information and combining information, as a way of organizing information and making sense of the many messages.

Twitter may also be a valuable source of information for policymaker decision-making as well, although there is some doubt as to whether policymakers can synthesize the enormous amount of information in time to arrive at a consensus about what the information is really saying. Nevertheless, public officials and policymakers can get feedback from their followers on Twitter.

Social Media Protocol

While the use of social media has become the norm in the coverage of disasters and emergency situations, most agencies still do not want their personnel initiating or involved in social media during the event. Some would NOT have their people use social media at all. Agencies need to have social media protocol in place so that first responders and other personnel are clear about the agency policy and the ramifications if they engage in social media.

An article in *The Counselor* (Association of Fire Districts, 2011) about social media policies recognizes that emergency services personnel have the right to use social media for personal purposes, but not in their functions as first responders without the permission and approval of their agencies. It says, “This policy is not intended to limit your right to freedom of speech or expression; but as we are a public entity, it has been put in place to protect the rights of this organization, its members and the public we are sworn to protect” (2011). The suggested policy states: “No information, videos or pictures gathered while on Department business (this includes emergency calls, meetings, drills, details, trainings or anything obtained on organization property or at organization functions) may be shared or posted in any format without the approval and written consent of the District’s Public Information Officer” (Association of Fire Districts, 2011).

Further, “members and employees are prohibited from disseminating or transmitting in any fashion photographs or images of individuals receiving emergency medical assistance. Any such transmission may violate [state] laws and/or the HIPPA privacy rights of such individuals and may result in a criminal and/or civil proceeding being commenced against members and employees violating this provision of the policy” (Association of Fire Districts, 2011). This policy may seem harsh; yet it protects both the agency and the first responder.

About Twitter

Started in 2006, Twitter is an online social networking service that enables users to send and read short 140-character messages called "tweets." In 2007, hashtags using the # (pound) symbol were introduced in order to identify and quickly search for a group of messages. In 2013, Vine was introduced, allowing short looping videos of six seconds or less to be linked to Tweets. While business and news were early adopters, by 2009 Twitter had gone mainstream and many celebrities were using the social media. In March 2015, Twitter had 288 million active users, tweeting 500 million messages daily. 27 percent of the users were outside the United States; 80 percent use mobile devices. Twitter supports 33 languages. Headquartered in San Francisco, it

had 3600 employees (50 percent engineers) located in 11 U.S. offices and 19 international offices (Twitter, Inc., 2015; Miller, 2009; Sippey, 2013).

While personal messages make up much of what is on Twitter, news has become a major part of the social media. In 2008 when the Mars Phoenix Lander found ice on Mars, NASA used Twitter to break the news. On January 15, 2009 a Twitter user was the first to announce a plane crashed in the Hudson River. On April 15, 2013 a witness reported hearing two loud booms near the Boston Marathon finish line. On January 7, 2015 as news broke about the attack at the offices of French magazine *Charlie Hebdo* people everywhere turned to Twitter (Stricker, 2015). In addition to news and information, Twitter is also used for marketing.

Twitter as a Marketing Tool

Marketers use trends on Twitter as a tool to identify popular topics, influencers, and audiences. A number of tools are valuable in doing this. When signed in to Twitter.com on a desktop or laptop computer, Trends are listed in many places, including the Home, Notifications, Discover and profile pages. Official mobile apps and mobile.twitter.com display Trends on the Discover timeline. Hashtags.org Analytics indicates which hashtags are trending, quickly and accurately, predicting beforehand topics of discussion on Twitter. Hashtagify helps businesses accelerate their growth, brand awareness and marketing effectiveness through intelligent Hashtag Marketing, by amplifying their reach, identifying and reaching the right influencers, and making smarter marketing decisions to secure new business. Mastering hashtag marketing is really about connecting with the hashtag influencers, and becoming an influencer. Hashtagify Pro finds the top 100 current influencers for any hashtag, providing information about who to connect with and how (Hashtagify.me, 2015).

Trending topics are those topics being discussed more than others. “Twitter Trends are automatically generated by an algorithm that attempts to identify topics that are being talked about more right now than they were previously. The Trends list is designed to help people discover the ‘most breaking’ breaking news from across the world, in real-time. The Trends list captures the hottest emerging topics, not just what’s most popular” (Twitter, 2010).

Twitter makes money by selling advertising and its data so companies can analyze consumer trends and gain insight on brands and competition (Gadkari, 2013). Twitter offers three major advertising methods for reaching its users (Anderson, 2014). The most popular advertising method is promoted tweets. Marketers can place tweets in users' timelines like any ordinary tweet. An algorithm that puts these promoted tweets on the timelines of the most appropriate users. A second form of advertising is promoted accounts which permits marketers to put their information in users' "Who to Follow" section or on users' timelines. Finally, the third advertising method Twitter uses is "Promoted Trends."

PROBLEM STATEMENT

This study attempts to answer the following question: What can be learned from student-produced case studies based on Twitter feeds to help emergency managers and public officials in making decisions about disaster response?

METHODOLOGY

Students in a crisis communication class were asked to use hashtags (#) or the search feature in Twitter to find a stream of tweets related to a specific disaster event or other emergency situation. They followed the tweets to links that provide more information or stories about the disaster. Then they copied and pasted the information in the Twitter feeds in chronological order so that the Twitter feeds provided a story of the event. They included the date of the tweet, the Twitter user name (in this format: @fisherhouse), and the source category from the list below with each Twitter message. Students were asked to record a minimum of 15 tweets, although some reported fewer. In addition, they provided comments about their experience using Twitter to search for details about a disaster event.

Students were asked to identify the tweets in four categories according to source of the tweets:

1. Media coverage of the event
2. Public reaction to the event
3. Official statements about the event
4. Other information or sources

The information was categorized into four groups based on source. Sources which were identified numerous times were described as influencers. Grounded theory was used to develop themes and propositions related to the questions in the problem statement (Glaser & Strauss, 1967). Students self-selected tweets they would report. Of potentially thousands of tweets on a topic, the students selected only enough tweets to tell a complete story using Twitter posts.

FINDINGS

The following table summarizes the source information from case studies of 14 student respondents (R1-R14). Students reported a total of 286 Twitter messages, 90 (31.5%) from the media, 105 (36.5%) from the public, 48 (17%) from public officials, and 43 (15%) from other sources. Most of the others were corporate or non-profit agency sources. Five other tweets from the #BostonMarathon bombing were made by Dzhokhar Tsarnaev (@J_tsar), convicted of the Boston Marathon bombing, who was active on Twitter even after the explosions. Influencers are those sources that were identified numerous times by the students.

TABLE 1: SUMMARY OF STUDENT CASE STUDIES

	Year	Main Hashtags	Other Hashtags	#Tweets	#Media	#Public	#Official	#Other	Influencers
R1	2010	#herrimanfire	#machinegunfire	28	4	16	4	4	@UtahRedCross
R2	2012	#HighParkFire		19	9	6	4		@LarimerSheriff @9News @JeremyHubbard
R3	2012	#sandy		17	7	1	3	6	@SuperStrmSandy
R4	2012	#hurricanesandy	#sandy	13	1	2	1	9	@SuperStrmSandy @NYGovCuomo
R5	2013	#BostonMarathon	#bomb #tweetfromthebeat	26	5	7	9	5	@Boston Globe @TheTodayShow @BostonPolice
R6	2013	#BostonMarathon	#tweetfromthebeat #bomb #bostonstrong	25	5	7	8	5	@BostonGlobe @BostonPolice @J_tsar
R7	2014	#koreanferry	#corpses	27	12	14	1	0	@BBCBreaking @USAToday @CTVScottHurst
R8	2015	#bogotaearthquake	#bogota	54	14	35	1	4	@USEmbassyBogota @SavageNation
R9	2015	#babylily		9	4	5			@KSLcom
R10	2015	#babylily		19	16	2		1	@KSLcom
R11	2015	#derailment	#Illinois	9	4	4	1		
R12	2015	#Vanuatu	#CyclonePam #Mormon	15	3	5	3	4	@UNICEFPacific @LDSChurch @sinkingislands
R13	2015	#SolomonIslands	#Vanuatu	10	6	1		3	@UNICEFPacific
R14	2015	#ShakeOut #Udot		15			13	2	@UtahShakeOut @BeReadyUtah
			TOTAL	**286**	**90**	**105**	**48**	**43**	

Comments

The following comments are reflective of the experience of the students as they searched Twitter for information about disaster cases. Student responder R8 followed the Twitters back to the beginning of the event and discovered that most initial tweets were made by the public. It was only later that the media picked up the story.

> As I searched for a disaster I was trying to find a disaster which was as recent as I could find. As I came across and began to read the "Tweets" I searched numerous #'s in attempt to find the first post in reference to the quake. I have determined it to be the individual noted above as 1, "@SergioCoelho13 Mar 10 01:58, Earthquake right now in #Bogotá," a member of the public with a short tweet. It also seems to me that most of the earlier tweets were by the public, even multiples in a minute. It took an alarming amount of time to finally get a post from a member of the media. As most social media sights were originally for personal use the media has taken ahold and riding the wave as they should. This chronological order of events and posts are a confirmation that if the media, emergency services departments, hosts, etc. are not watching and monitoring the social

> media websites they will be left in the dark and be the last to report on a significant story (R8).
>
> The earthquake in Bogota was not an immense event but far enough away and just big enough to cause the posts to be heard from around the world. Members from multiple countries responded to and with tweets. In one of my searches which I was unable to replicate, there was an instance where a female reporter replied to a post by an individual in whom she assumed had information regarding the quake and that he may possibly have been there. She even asked if she could contact him by telephone. She then shortly after replied with a message apologizing she did not notice he was from another media agency. This goes to prove that media associations are watching social media and they are making every effort to get additional information on a story. (R8)

Respondent R1 was a witness to the event when it happened but was not using social media at the time. While phone lines and other communications were not working, people were able to use social media. Thousands of Twitter posts were generated.

> At the time of this fire I was living in Herriman City, and I recall the communication problems that everyone was having when trying to locate family members and get updates on the fire. The cell phone towers were bogged down, and I knew people had resorted to using social media to communicate, but when I search for this fire on Twitter I was not expecting to see what I found. I was shocked to see how many concerned community members, news stations, local businesses, federal agencies, and other organizations were posting about the fire. All I had to do to find the information was type the words Herriman Fire into the Twitter Search and scroll to the date of the fire, and I found thousands of posts. I have never been an advocate for social media, but I am definitely starting to see its many benefits. (R1)

A local Utah story got national attention when an 18-month-old baby was rescued after 14 hours in a car turned upside down in a river. Her mother died in the crash. While the hashtag #babylily was used during the event, it existed before and still is used for other stories:

> It was more difficult to find posts that originated from the initial release of the story. I search for "Toddler in car accident" and found some posts pertaining to this story. It was not until today's posts that I noticed a hashtag had finally been produced, #babylily, and the majority of posts that relate to the incident now use it, which makes following the story easier. I did not copy down every Tweet I found, since there were many that all said the same thing. There was also a lot of conflicting information about how long Baby Lily was in the water, how old she is, and what time the car crashed. I think there will also be more "public reaction" to this story in the next few days. This is still a relatively new story on twitter, since it happened last weekend, a lot of people are still hearing about it (and subsequently tweeting about it) for the first time. There is also still a lot unknown, such as what caused the car accident, and who has legal custody of Baby Lily, that the public wishes to know. (R10)

Here are a sampling of tweets from R9 who also reported on #babylily. In this event all tweets from the public were re-tweets of news media stories:

- I searched #babylily in reference to an 18 month old girl that survived the night in her car seat that was suspended in the car her mother had been driving that rolled over into a ditch. The most recent results appeared at the top so I scrolled down to the bottom. The first tweet was submitted by @tracysnowder. [R10]
- March 9th, 2015. @tracysnowder (public) Baby found alive inside car in Spanish Fork river now in stable condition http://ksl.to/wYP1RE
- March 11, 2015 - @World_News_N1 (Media coverage & Other information) Watch: Mystery Surrounds 18-Month-Old **Lily**'s Miraculous Survival: **Toddler** survives being trapped for 14 hours... http://abcn.ws/1KUVOvr
- March13, 2015 @KSLcom (Media coverage) Exclusive: Body-cam footage shows rescue of 'Baby Lily' after crash #**BabyLily** #LilyRescue http://ksl.to/ZLvkvo

CONCLUSION

The use of social media has changed the way the public is informed about disasters and how to recover from them. While the traditional media continue to play a key role, social media have given citizens a means to inform and protect each other as well as to alter public policy and the official approach to dealing with emergencies. The Haiti earthquake was a watershed moment that changed how social media are used in disasters. While social media were independently evolving in the years leading up to 2010, the use of social media in the Haiti disaster made public officials aware of their potential in disaster response. Since then, social media have played an important part in informing and keeping the public safe at both the local and national levels.

This study proposed that student-produced case studies based on Twitter feeds can help emergency managers and public officials in making decisions about disaster response. The following conclusions are drawn from analysis of the data generated from the student case studies of Twitter posts and may be valuable considerations for public officials and policy makers:

- This study showed that by searching #hashtags enough information can be generated from Twitter to build a chronology of disaster events. The complete story can be available on Twitter, although as pointed out by R10, the story may be fragmented as it emerges, and information may be lacking and inaccurate. Questions may be left unanswered. This confirms Sutton's claims (as cited in Maron, 2013) that "all the fast-paced information available via social media does pose inherent risks when navigating emergency situations."
- Most influencers (i.e., @BBCBreaking) appear to be established media. Influencers set trends and provide information that other users may use or re-tweet. Even as people

obviously still watch television and listen to the radio during a disaster or emergency event, they also rely upon the media for information to tweet.

- Many Twitter messages that students identified as originating from the public were re-tweets or linked to the media stories.
- While the media rely on public officials for information and comments for their stories, the public official presence on Twitter appears to be much less than that of the general public. Still, the study seems to confirm that emergency agencies can determine what people are saying by tracking hashtags.
- In situations with numerous victims (like earthquakes, hurricanes, or wildfires) public tweets provided information to the media and to public officials. These tweets had the potential to provide information that other members of the public, the media, and public officials could use for decision-making. Eyewitnesses do become "first line reporters" of what is happening.
- Twitter may serve as "a platform for information interaction" as public observations and official comments are picked up by the media and then are re-tweeted or placed on Facebook for a broader social media audience.

The following are questions left unanswered by this study that require further study:

- How can emergency managers use Twitter to follow a disaster situation?
- How does Twitter trending help in disaster decision-making?
- How can emergency managers identify disaster hashtags? And trends in uses of Twitter during disasters?
- What disasters become major trending topics on Twitter?
- How are hashtags established for disasters? Why do some flourish while others decline in use or die?
- What are major disaster trends on Twitter? Who are major disaster influencers on Twitter?
- What kind of disaster Twitter information is retweeted?

While this study is limited by the number of cases and Twitter posts in each case study, it does provide valuable insights into the use of Twitter as a social medium in disasters and other emergencies. Twitter has become a powerful tool for the traditional media and the public in information gathering and information sharing. Similarly, government officials and emergency agencies can use Twitter as a source to provide disaster awareness, decision-making information, and public feedback.

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PREDICTING THE LEARNING EFFECTIVENESS IN A BUSINESS ETHICS CLASS BY EXPERIMENTAL MEASURE

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ABSTRACT

Many universities are trying to teach ethics to their graduating business majors by offering a course in business ethics. In this paper, an experiment was designed to test the efficacy of this practice. After about three months of the course, the instructor has the results of exam 1 (an objective test), as well as an essay test on practical applications of ethics, and would like to predict student success. Before the end of the semester the instructor would like to know if he has correctly ranked those students from the combined score of the objective and essay tests (acid tests of ethical knowledge). Before the second and final comprehensive exam, he wants to determine if there is a correlation between the rank-order of performance from test 1 with the final comprehensive exam. He has formed the hypotheses (H_0): the rank-order of performance in exam 1 has no relationship to the comprehensive final exam score. This experiment will be tested with alpha of .05.

Keywords: Teaching Effectiveness, Learning Outcomes, Learning Effectiveness

INTRODUCTION

Predicting learning effectiveness in the business ethics course for the juniors and seniors has been a paramount objective of the undergraduate business program at Our Lady of the Lake University and other programs like it. The importance of teaching ethics to our undergraduates cannot be overstated for preparing them successfully for business. But the effective attainment of inculcating ethics is always debatable. Although there are many ways to teach business ethics, the effective learning outcome has always been on the spotlight of this course. How do you determine that a business ethics course has been effective in providing specific learning outcomes in a measurable way? There are about 15 or 16 important areas of ethics in the undergraduate ethics curriculum and every one of them is of interest. We would like to know how to tell if ethical learning has taken place and how it can be measured.

If, for example, a teacher wanted to start a lively conversation in order to encourage active learning, he or she could pose a question: who is the best ethical leader that you consider to have had a significant impact on the whole of the world? The discussion that follows could lead us to a very important outcome for the students to learn: that the leaders they select would be significantly different, and there would be no agreement on the traits or qualities of the most successful ethical leaders in the world. This is the dilemma that faces this author in examining

the outcomes of an effective ethics class and how to measure those outcomes from real student performances. There are many different "right" answers to many questions pertaining to ethics.

Emulation of teacher effectiveness was achieved by following the "acceptance theory of teacher's authority" developed by Barnard (1998) by looking at the following classroom teacher behavior (the activity is the evidence of behavior):

- At the time of teaching the student understood what is being taught
- At the time of teaching the student understood and believed that it is to her personal interest
- At the time of teaching the student understood and believed that it is to the organizational interest
- At the time of teaching the student understood and believed that she is biologically (mentally, physiologically and physiologically) capable of executing the assigned task. (Barnard, 1998)

This is the teaching effectiveness philosophy of Barnard (1998) that is being subscribed to in teaching ethics, and in keeping with the conviction that is laid down in the above precepts of teaching effectiveness. Teacher behavior that promotes students in learning ethics can be demonstrated in their strong use of ethical decision-making as a way of "perceived change" either in their cognition or in behavior, demonstrated in creative writing using immersive learning from "sensitive" cases in the form of "Reaction, Learning, Behavior, and Results" (Barnard, 1998). That is the offshoot of Barnard's main elements of "cooperative learning outcomes in the class" defined as students': "(i) willingness to communicate, (ii) willingness to cooperate, (iii) willingness to contribute to a (iv) common purpose: that is learning" artfully precipitated by the teacher in the classroom (1998).

LITERATURE REVIEW: TEACHING EFFECTIVENESS

Instructional effectiveness research focuses on student satisfaction either by in class (face-to-face) or online surveys to measure success. Such research has emphasized that the beneficiaries of instruction are the students themselves. The consequential and transcendental results of teacher development due to classrooms being increasingly student centered has not been researched as much. In this literature review, we will explore how other fields teach ethics and study the effectiveness of ethics education.

Dow et al. (2015) performed a mixed methods study of library and information science (LIS) graduate students from the Midwest to determine how effective a case-based pedagogy was for teaching ethics. They collected both qualitative and quantitative data for both pre- and post-assessment. The class that was studied moved away from simply having lectures wherein students were then expected to memorize facts for tests, and instead used a more dynamic learning process. They used a model based upon Dervin and Clark (2003) to overcome communication gaps. In this class, students studied cases, real situations related to privacy, studied intellectual property, and intercultural and professional ethics (Dow, 2015). Initial findings suggest that using cases in this way helped students to describe and explain the basics of information ethics, to apply models to ethical cases for decision making, let them practice

flexible communication, improved awareness of tolerance, and improved students' self-reported interest in information ethics (Dow, 2015). Dow et al. believe that this type of case-based instruction for ethics shows a lot of promise and might be a good way to teach ethics outside of the social science disciplines.

Schmidt et al. (2013) argue that businesses and business schools both are concerned with effective ethics teaching and finding ways to foster ethical behavior in graduates. There is not a single approach that has been identified as exemplary. However, Schmidt et al. propose one approach, "deliberate psychological education, [which] offers a means for extending and integrating elements of developmental theory and has proven effective in professional settings, with college students, and recently, with undergraduate business students" (p. 127). The article proposes a way to use this model within the curriculum.

Preston-Shoot et al. (2011, p. 339) write that medical education presents content on the ethical responsibilities of doctors to protect patient health and well-being. Curriculum statements have begun to advise on core content and methods for organizing teaching and assessment. However, they observe that no comprehensive overview of approaches to the delivery of this curriculum has been undertaken (Preston-Shoot et al., 2011). They suggest that we assess the nature and strength of the published evidence base for the teaching, learning and assessment of ethics in medical education. This could be applied to business education as well. Their study provides a thematic content overview from the best available literature on the teaching of ethics to medical students and on the assessment of their ethical knowledge and skills, relying on measures of student satisfaction and on evaluating short-term outcomes rather than assessing whether knowledge is retained and whether learning impacts on patient outcomes. They also suggest that further research is needed into effective methods of teaching, learning and assessing ethical knowledge and skills during and following initial medical education.

By a meta-analytic study, Tomcho et al. (2008) found that teaching researchers can assess learning outcome effectiveness as a function of students' graded performance or by their consequent changes in knowledge, skills and behaviors, or attitudes. The researchers meta-analyzed 197 studies to determine the effectiveness of teaching activities in psychology. They found that most studies saw a mid-sized effect across all types of learning outcomes. They suggested that, given the effectiveness of psychology teaching activities, researchers should address the "(a) potential confounding role of teacher rapport, immediacy, and alliance in evaluating teaching effectiveness; (b) ethics of teaching activity development; and (c) appropriateness of using course grades to assess teaching activity effectiveness" (p. 286).

Grauerholz (2007) argues that we need to first start by looking at the ideology of students and uses this to rethink a strategy for efficient teaching. Finding out what students believe as they enter the class allows them to be more sociable and knowledgeable in the course, and it also gives teachers space to be more critical and reflective of their teaching style. Grauerholz (2007) also notes that teachers must be willing to change their outlooks at the same time as they ask their students to, as their teaching relies about contextual factors. The study also touches upon active learning practices that can help to improve students' ethical and moral imaginations.

Vynckier et al. (2015) studied nursing students in Flanders, Belgium using the Students' Perceived Effectiveness of Ethics Education Scale. In this study, students were asked to critically reflect "on their own values as the only ethical competence promoted by ethics courses, failure of ethics courses to meet some basic ethics education objectives, and need for further SPEEES improvement and larger scale research" (Vynckier et al, 2015, p. 287).

Trelstad (2008) studied the ways that we might engage "conservative" students in new ways in order to change their world view and lives. Is doing so ethical? Trelstad (2008) argues that we need to take their position and concerns seriously and should not consider them ignorant if we are to be "trustworthy" educators (p. 191). Trelstad argues that conservative students make the same types of critiques as their more liberal contemporaries, and should be taken seriously in pedagogy. Current postmodern, postcolonial, and feminist pedagogies aim to tear down and analyze bias and power in the classroom—but Trelstad (2008) says that we must be careful in choosing these pedagogies because things like "method, thinking skills, and subjects are themselves bias-laden" (p. 191). We should focus, then, on becoming better educators for students who come from all political and religious backgrounds.

Eun-Kyung et al. (2009) argue after their study of medical education and ethics that teaching medical ethics presents many challenges—especially that students do not always see the value in learning it. There also aren't many effective teaching methods used by faculty for this course. In their study, Eun-Kyung et al. (2009) introduced team-based learning (TBL) to the ethics course and evaluated how it affected student engagement and satisfaction as well as educational achievements. The course consisted of four two-hour sessions for first-year medical students. Student engagement was judged by scored on the IRAT, GRAT, application exercises, and final examination, as well as the students' own perception. Most students found the TBL activities to be more engaging than a conventional ethics course, with GRAT scores being much higher than IRAT scores (Eun-Kyung et al., 2009). Student performance was overall improved and the TBL method should be considered for application in other courses in medical education as well.

In an engineering paper, Alfred et al. (2012) describe a second generation Simulator for Engineering Ethics Education. Similar to the first generation, students are placed in a first person perspective as they face scenarios involving various types of ethical situations. Students must then gather data, make assessments, and come to decisions. Like the first generation, students develop a response to ethical engineering situations as a result. However, the first generation used a "dogmatic model based on National Society of Professional Engineers' Code of Ethics" (p. 689), the second generation approach incorporates the actual experiences of engineers that have been involved in real ethical situations. The students are also given feedback about the effectiveness of their decision and how it might affect their future professional career. In their study, they saw a 59 percent increase in knowledge and a 19 percent improvement in teaching effectiveness over an internet based approach (Alfred et al., 2012).

Cannaerts et al. (2014) discuss a study they performed on nursing students/educators' perception of what the contribution of ethics education is to the later ethical competence of nursing students. It addresses questions including how they look at the general contribution of ethics education, the contribution of ethics education to ethical competence, and the features of ethics education needed to promote ethical competence. It suggests that ethics education adds to the ethical

awareness and ethical reasoning competencies of nursing students, as it should to business students.

Numminen et al. (2011) analyzed how nurses' codes of ethics are taught in Finland. They had a total of 183 teachers and 214 student respondents to their questionnaire, which was analyzed by SPSS. Classes consisted of learning about many different nurses' codes of ethics, and the nurse-patient relationship was also highlighted. By the end of the courses, students' ability to apply the codes of ethics was still somewhat mediocre, but both students and teachers thought that the teachers' understanding of and knowledge about the codes of ethics was adequate. The teachers taught the codes extensively, but they were not learned as extensively. Numminen et al. (2011) believe that future research should focus more on ethics education's organization and effectiveness as well as upon educators' competence.

As early as 1949, Tyler showed that a prescriptive syllabus and teaching could be made very effective in the classroom—the students benefited from the expertise of the teacher in the classroom if they conformed to the teacher-centered way of teaching. Learning happened. Students just learned material without question. The teacher was prescriptive at the same time as being effective.

The following is a depiction of student-centered classroom evaluation which will speak to student learning efficacy under a completely cooperative setting. The pictures are courtesy of the IDEA center for innovative evaluation of student centered learning effectiveness.

PREDICTORS OF SUCCESS

In our course syllabus we measure success by:

1. Homework assignments of four written case analyses (tests of application, analysis, synthesis)
2. e-Quizzes from chapters taken in the Blackboard LMS (tests of knowledge and understanding)
3. e-Midterm exam—computerized and proctored—is taken at the Assessment center (test of comprehension)
4. e-Final exam computerized and proctored—is taken at the Assessment Center (test of comprehension)
5. e-Midterm + Final exam averages computerized and proctored—(summary test of comprehension)
6. Summary of all as the course grade

According to Boatright's (2009) text, we examined teaching and learning ethical cases (with homework and presentations with student involvement) on glaring ethical subjects such as:

- Ethics in the world of business
- Welfare, rights and justice
- Equality, liberty, virtue
- Whistleblowing

- Trade secrets and conflict of interest
- The ethics of privacy
- Federal affirmative action
- Women's and family issues
- Unjust dismissal
- Marketing, advertising and product safety
- Ethics in finance
- Ethics and corporations
- International business ethics

We used two cases per class for discussion so we did approximately 30 cases in the course of one semester. Each chapter above starts with a glaring case scenario in which something drastically wrong has happened ethically. From five stakeholder points of view the student is supposed to analyze what is the ethical problem, who is the worst offender, who has suffered the most, what would be the best course of ethical action, and how ethics and justice should prevail. Evidently there is no straightforward answer to each problem but there is a pejorative for the students to learn to be devil's advocates. With such a scene given, the question is: how do you make the course predictably effective so that you prepare a student to become an ethical leader?

The following are the course outcomes for the course. After successful completion, the student will:

1. Demonstrate an understanding of how the social, economic, political, technological and ecological dimensions of internal and external environments create a moral and social context for business decision making.
2. Demonstrate an ability to apply personal values and ethical principles as a basis for identifying, analyzing and managing ethical issues in contemporary business settings.
3. Demonstrate the ability to analyze the influence of critical stakeholders on business operations, and to apply principles of stakeholder management to contemporary issues in business practice.
4. Demonstrate an understanding of the complex interdependencies that exist between business and government, and of their strategic importance to corporate decision making.
5. Demonstrate an understanding of the legal, ethical, and social responsibilities of business toward their members, their customer, and the natural environment.
6. Demonstrate the ability to recognize and solve contemporary ethical and social issues in the business, economics or public administration decision-making process.

Teaching an ethics course is not like teaching any other course because its learning outcomes (listed above) are very difficult to measure. What has been tested here is to determine the learning effectiveness of this course of 15-week duration. The course met once a week in the evening for three hours. The most preferred method of teaching was via lecture. Students were asked to prepare a relevant chapter of the book a week in advance for presentation. Two people were assigned to a chapter. This student team was also assigned a case to discuss and present. Individual written cases were also submitted. Every week there were review and retention quizzes from the assigned chapters. The following is the summary of grade distributions and the

predictably effective outcome for the course. Statistical analysis and procedures were followed with reference to *Statistical Tests* by Weiers (2013).

TABLE 1: ASSESSMENT and GRADING

Instrument of assessment	**Outcome assessed**	**Percent of grade**
I. Homework consisting of four assigned written Case Analyses (test of application, analysis, synthesis)	1,2,3,4,5,6	**20%** **PREDICTOR OF SUCCESS 1**
2. e-Quizzes from chapters in the Blackboard LMS (test of knowledge and understanding)	1,2,3,4,5,6	**20%** **PREDICTOR OF SUCCESS 2**
3. e-Midterm exam—computerized and proctored—taken at the Assessment center (test of comprehension)	1,2,3,4,5,6	**30%** **PREDICTOR OF SUCCESS 3**
4. e-Final exam computerized and proctored—taken at the Assessment Center (test of comprehension)	1,2,3,4,5,6	**30%** **PREDICTOR OF SUCCESS 4**
5. Required presentation of the assigned case to the class for discussion. Students learn from their preparedness in applying theories of ethics and in persuasive ethical arguments (test of application)	1,2,3,4,5,6	This is a required activity. Please see the assignment by BB-email. Excellent PowerPoints made from the e-notes (provided to the student) will be given a grade as extra credit. So do excellent power point slides of your presentation.
ALL	1,2,3,4,5,6	100%

LEARNING FROM CASES IN 'RLBRS' FORMAT

The learning from studying a renowned case (like Merck and AIDS) is an important part of the assignment and the course (students did three cases for 15% of the course grade). As such they were instructed to use four levels of learning in the following format:

Comprehensively write in each area of reaction, learning, behavioral impact, and the result of that impact, and a succinct summary statement that is at the highest level of "affect."

EXAMPLE OF AN ETHICS CASE ANALYSIS WITH RLBRS FORMAT

Case: Merck and AIDS in South Africa

Your Reaction from Reading

My first reaction was shock at the number of HIV positive people and AIDS patients in South Africa. It is alarming that such a large amount of people are affected by such a horrendous and deadly disease. It is unfortunate that many cannot afford the necessary medications to ease their suffering.

Your Learning from Reaction

I learned that there would be many implications to lowering the prices of medicines in South Africa and allowing generic medicines to be sold at a discount. One of the major implications that I had not realized was the impact that this would have on research. Medicines are sold at a certain price in order to recover the money spent on research to find the medicine necessary for certain ailments. If researchers are no longer compensated and companies are not promised a return, research is likely to greatly suffer.

Your Behavior from Learning

It is unfortunate that so many South Africans must live with the plight of HIV and AIDS. Even if medicines were reduced in price, many South Africans would still not be able to afford the necessary medications. Allowing generic medicines to be distributed would have negative implications globally because these generic medicines could be diverted and sold for cheap in countries that are not in such a dire need as South Africa.

Your Results from Behavior [that may accrue as a resultant change]

As a corporation, it is important to be mindful of the general public. HIV and AIDS is a major issue in South Africa, due to the fact that such a large amount of the population lives with this disease. Corporate responsibility should override profit but this would affect research and other markets in the long run.

Succinct Summary [of a significant learning outcome that occurred]

A significant learning outcome is of the tremendous impact that generic medications would have globally. It is easy to say that South Africans should be provided with cheap, generic medication that will serve the purpose of aiding those who are in need. However, this would affect other nations, demand for medication, and even research which prevents other severe ailments.

Question and Answer:

1. *Is the South African law morally justified? Although patent protection is important, does the AIDS crisis in that country outweigh the benefits from patent protection (even for South Africa)? Were the multinational pharmaceutical firms justified in contesting the law?*

   The South African law should coincide with what is best for its people. Because HIV and AIDS is a crisis in South Africa, these people should have some way of receiving the proper care and medication necessary to live. It is understandable that the multinational pharmaceutical firms would contest the law due to the implications that this would have on everything from other countries to research itself.

2. *Why is patent protection important? Are developing countries justified in arguing that health and well-being take priority? (Note: One might also ask whether the U.S. position is consistent given that the U.S. government forced Bayer, a German company, to slash the price of Cipro to less than $1 a tablet during the Anthrax scare after September 11, 2001.)*

   Patent protection is important because it can help to ensure that researchers are fairly compensated. If they are not compensated for the time and energy spent in researching a cure or treatment for a certain ailment then this type of research is not likely to continue. Without research, cures would never be found.

3. *What motivated Merck to reduce the price of its AIDS drugs by 90 percent? Was Merck being forced by adverse publicity to make an unwarranted decision, or was this a sound decision under the circumstances? (Note: The drugs that Merck sold in South Africa would not have been purchased otherwise, and so Merck suffers no loss as long as the drugs are produced at cost.)*

   Merck was motivated by the crisis of South Africa and that so many infected people were in need of medication. This was a sound decision because, after all, the purpose of research and this medication is to help those who are most in need. I believe, though, that it was also in the best interest of Merck to provide cheaper prices as a way to prevent negative publicity.

4. *What is your opinion of AIDS epidemic in the world where people do not get the medicine which is too expensive for the patients? What is your suggestion as a world citizen (not just an American)?*

   My opinion of the AIDS epidemic and people not being able to access affordable medication is that this is a major issue that needs to be solved. There must be some way that researchers and companies will still be fairly compensated for providing citizens with medication in order to treat their ailments. If I were a researcher, I would not expect to live in the lap of luxury; I would be more concerned with making discoveries to help others and to be fairly and not exponentially compensated. As a world citizen I am quite concerned with this epidemic. It is terrible that those in need cannot afford medications.

TABLE 2: CONSOLIDATED GRADEBOOK FOR EXPERIMENT

Midterm100 POS 3	Final100 POS 4	ExamsAVE POS 5	Course 100 POS 6	Quiz100 POS2	Cases100 POS1
75	77.1	76.05	77.5	62.3	97
73	98.8	85.9	71.7	83.6	17
85	83.1	84.05	80.9	96.6	56
83	75.9	79.45	71.5	89.0	30
62	62.7	62.35	65.8	84.9	57
88	97.6	92.8	81.3	75.3	53
87	94	90.5	87.1	95.9	68
86	98.8	92.4	92.2	87.0	97
78	79.5	78.75	79.3	64.4	96
91	91.6	91.3	76.5	88.4	20
84	98.8	91.4	92.5	92.5	96
84	69.9	76.95	81.2	99.3	76
89	95.2	92.1	93.4	93.8	97
92	100	96	89.6	84.9	75
93	92.8	92.9	92.9	96.6	89
91	98.8	94.9	95.5	97.9	95
89	98.8	93.9	94.5	93.8	97
32	60.2	46.1	52.4	83.6	40

POS 1, 2 3, 4, 5 AND 6 ARE THE PREDICTOR OF SUCCESS VARIABLES

ANALYSIS OF THE RESULTS WITH VARYING PREDICTOR OF SUCCESSES (POS)

XLSTAT (2013): 2013.6.03 - Comparison of two distributions on 1/4/2014
Sample 1: Workbook = MGMT 4395 DATA.xlsx / Sheet = Sheet4 / Range = Sheet4!$C$1:$C$19
/ 18 rows and 1 column
Sample 2: Workbook = MGMT 4395 DATA.xlsx / Sheet = Sheet4 / Range = Sheet4!$D$1:$D$19
/ 18 rows and 1 column
Hypothesized difference (D): 0
Significance level (%): 5
p-value: Asymptotic p-value

FIGURE 1: RESULT OF HYPOTHESIS TESTING FOR PREDICTOR OF SUCCESS 4 AND 6

1. USING HYPOTHESIS TESTING FOR PREDICTOR OF SUCCESS 5 AND 6

examsave	18	0	18	46.100	96.000	84.322	12.998
course 100	18	0	18	52.372	95.529	81.992	11.645

FIGURE 2

Two-sample Kolmogorov-Smirnov test / Two-tailed test:

D	0.222
p-value	0.709
alpha	0.05

An approximation has been used to compute the p-value.

Test interpretation:
H0: The two samples follow the same distribution.
Ha: The distributions of the two samples are different.
As the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0.
The risk to reject the null hypothesis H0 while it is true is 70.88%.

2. RESULT OF HYPOTHESIS TESTING FOR PREDICTOR OF SUCCESS 2 AND 6

XLSTAT (2013): 2013.6.03 - Comparison of two distributions on 1/4/2014
Sample 1: Workbook = MGMT 4395 DATA.xlsx / Sheet = Sheet4 / Range = Sheet4!$E$1:$E$19 /
18 rows and 1 column
Sample 2: Workbook = MGMT 4395 DATA.xlsx / Sheet = Sheet4 / Range = Sheet4!$F$1:$F$19 /
18 rows and 1 column
Hypothesized difference (D): 0
Significance level (%): 5
p-value: Asymptotic p-value

FIGURE 3

3. USING HYPOTHESIS TESTING FOR PREDICTOR OF SUCCESS 2 AND 6

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
quiz100	18	0	18	62.329	99.315	87.215	10.712
course 100	18	0	18	52.372	95.529	81.992	11.645

FIGURE 4

Two-sample Kolmogorov-Smirnov test / Two-tailed test:

D	0.389
p-value	0.098
alpha	0.05

An approximation has been used to compute the p-value.

FIGURE 5

Test interpretation:
H0: The two samples follow the same distribution.
Ha: The distributions of the two samples are different.
As the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0.
The risk to reject the null hypothesis H0 while it is true is 9.82%.

XLSTAT (2013): 2013.6.03 - Comparison of two distributions (Kolmogorov-Smirnov, ...)

Sample 1: Workbook = MGMT 4395 DATA.xlsx / Sheet = Sheet4 / 18 rows and 1 column
Sample 2: Workbook = MGMT 4395 DATA.xlsx / Sheet = Sheet4 18 rows and 1 column
Hypothesized difference (D): 0
Significance level (%): 5
p-value: Asymptotic p-value

FIGURE 6: RESULT OF HYPOTHESIS TESTING FOR PREDICTOR OF SUCCESS 3 AND 4

4. USING HYPOTHESIS TESTING FOR PREDICTOR OF SUCCESS 3 AND 4

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Midterm100	18	0	18	32.000	93.000	81.222	14.575
Final100	18	0	18	60.200	100.000	87.422	13.371

FIGURE 7

Two-sample Kolmogorov-Smirnov test / Two-tailed test:

D	0.500
p-value	0.014
alpha	0.05

An approximation has been used to compute the p-value.

Test interpretation:
H0: The two samples follow the same distribution.
Ha: The distributions of the two samples are different.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 1.37%.

XLSTAT (2013): 2013.6.03 - Distribution fitting - on 1/4/2014 at 4:19:52 PM
Data: Workbook = Book2 / Sheet = Sheet1 / Range = Sheet1!$G$1:$H$19 / 18 rows and 2 columns
Significance level (%): 5
Distribution: Normal
Estimation method: Moments

FIGURE 8: RESULT OF HYPOTHESIS TESTING FOR PREDICTOR OF SUCCESS 1 AND 4

5. USING HYPOTHESIS TESTING FOR PREDICTOR OF SUCCESS 1 AND 4

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
cases 100	18	0	18	17.000	97.000	69.778	28.472
course 100	18	0	18	52.372	95.529	81.992	11.645

Distribution fitting (cases 100):

Estimated parameters (cases 100):

Parameter	Value
μ	69.778
sigma	28.472

Statistics estimated on the input data and computed using the estimated parameters of the Normal distribution (cases 100):

Statistic	Data	Parameters
Mean	69.778	69.778
Variance	810.654	810.654
Skewnes (Pearson	-0.551	0.000
Kurtosis (Pearson	-1.223	0.000

Kolmogorov-Smirnov test (cases 100):

D	0.201
p-value	0.418
alpha	0.05

Test interpretation:
H0: The sample follows a Normal distribution
Ha: The sample does not follow a Normal distribution
As the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0.
The risk to reject the null hypothesis H0 while it is true is 41.76%.

DISCUSSION

The idea that ethics learning outcomes must be examined from different interventions led us to incorporate different interventions in the syllabus such as Review/Retention, Exam 1 (the midterm), Exam 2 (the final), the average of the two exams, Cases, and the course grade. These variables have been taken as predictors of success and they are named as POS1, POS2, POS3, POS4, POS5, and POS6. Effect of each variable has been isolated to have an impact on the final grade.

Let's take the effect of Cases first. When we compare the POS1 (Cases) as an independent variable having impact on the POS6 (course grade), we can see that both are independent distributions that can be tested with the null hypothesis that H0: the sample follows a normal distribution or Ha: the sample does not follow a normal distribution. The statistical test was done with an alpha of .05 and the result was that as the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0 and that the risk to reject the null hypothesis H0 while it is true is 47.76%.

Let's take the effect of POS 2 (Review/Retention) next. When we compare the POS2 (Review/ Retention) as an independent variable having impact on the POS6 (course grade), we can see that both are independent distributions that can be tested with the null hypothesis that H0: the sample follows a normal distribution, or Ha: the sample does not follow a normal distribution. The statistical test was done with an alpha of .05 and the result was that as the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0 and that the risk to reject the null hypothesis H0 while it is true is 9.82%.

Let's take the effect of POS 3 (Midterm) next. So when we compare the POS3 (Midterm) as an independent variable having impact on the POS4 (Final exam), we can see that both are independent distributions that can be tested with the null hypothesis that H0: the sample follows a normal distribution, or Ha: the sample does not follow a normal distribution. The statistical test was done with an alpha of .05 and the result was that as the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha. The risk to reject the null hypothesis H0 while it is true is lower than 1.37%.

Again, let's take the effect of POS 5 (exams average) next. So when we compare the POS5 (exams average) as an independent variable having impact on the POS6 (Course grade), we can see that both are independent distributions that can be tested with null hypothesis that H0: the sample follows a normal distribution, or Ha: the sample does not follow a normal distribution. The statistical test was done with an alpha of .05 and the result was that as the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0 and accept the alternative hypothesis Ha. The risk to reject the null hypothesis H0 while it is true is 70.88%.

CONCLUSION

With this analytical method it has been shown that a teacher can intervene in six different ways to enable learning in students enrolled in an ethics course and that learning can be measured and moderated in a variety of ways as well. The only result that is significant in this exercise is that the teacher could control the student behavior from the midterm exam to final exam, as the results showed that students got alarmed with their first exam performance and did significantly better in the final exam. The author expected that the performance in the case would also yield a similar result with the course grade, but the case performance and the final course grade were not significantly different, because in this case as the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0 and that the risk to reject the null hypothesis H0 while it is true is 47.76%. This means that the student did not significantly perform better, probably because they did not invest as much time to gain from cases to improve their course grade as they did by studying for the final exam. This replicates the student behavior as such in general, due to the weight associated with the final exam, psychologically as well as philosophically.

In this class, we are teaching "emotion" in ethics as the cases indicate, so we are developing "emotional intelligence" and "feelings" in these students. The teacher's job, if he is effective, will be to use all the behaviors of "emotional intelligence" to demonstrate how to deal with the case studies-- as the case of "Merck HIV/AIDS" shows. I believe teaching effectiveness either in the ethics classroom, or in the general classroom, deals with the same set of behaviors of the teacher to evoke "emotion" in the classroom (both are termed as emotional intelligence).

LIMITATIONS OF THE STUDY

There are various limitations to this study in that student behavior and attention was difficult to control in class. Some students did not like to do case studies as diligently as they demanded. Some students spent more time preparing for the exam and the commensurate reward was little.

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DAY-TO-DAY COMMUNICATION BETWEEN TWINS SIBLINGS: A CONVERSATION ANALYSIS STUDY

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ABSTRACT

In this study, conversation analysis is used to examine instances of naturally occurring conversations between twin siblings. The following research question guided this study: What communicative patterns are occurring in everyday talk between twin siblings? Findings suggest that there are patterns of analytic interest present in day-to-day conversations between twin siblings. The conversational phenomena discovered included testing and speaking for one's twin. Twins engaged in testing while conversing alone to show support for their twin. As they engaged in talk with a parent present, that talk served as competition/support, role confirmation/enactment, and identification/deidentification between the twin siblings. Speaking for one's twin functioned as a competitive move, as support, and as a way to gain attention from a parent.

INTRODUCTION

The study of family communication grew out of the field of interpersonal communication in the 1970s and over the decades has taken on its own life (Rogers, 2006). According to Rogers (2006), "The family has been a central domain of study in the social sciences from the early institutional view of the family as a primary social unit to the more recent view of the family as a dynamic, socially constructed system of relationships" (p. xv). Within the field of family communication, the following topics are among the most researched: types of families, parent-child relationships, conflict, intimacy, discipline, rituals, family and the workplace, family and the media, and family and school (Turner & West, 2006b; Vangelisti, 2004). Over the past two decades, family communication study has expanded beyond earlier research boundaries (Turner & West, 2006b).

> Movements in the field have spread out over a large terrain of family-related topics with the investigation of different family forms, lifestyle issues, issues of diversity, health and aging, violence and abuse, mass media and the Internet, social support, attachment, and feelings and emotions. (Turner & West, 2006b, p. xvii)

Researchers study these topics as they relate to parents, children, siblings, and extended family members. The family relationships and topics discussed by these scholars reveal significant findings; however, the most common type of relationship in America, siblingship, is underrepresented in the research.

Within the family unit, researchers have analyzed subsystems that influence the dynamics of family communication. According to Floyd (1996), 80% of Americans have one or more siblings;

however, family communication has predominately focused on other subsystems such as the parent/child relationship (Turner & West, 2006b; Vangelisti, 2004). Within sibling communication research, twins have received even less attention.

The modest amount of research on twins is perplexing because our popular culture seems to be fascinated with multiples, from the early 1960s with the introduction of the Wrigley's Doublemint Gum twin commercials, to the Olsen twins of *Full House* (1987-1995), to *Jon and Kate Plus Eight* on The Learning Channel (TLC). According to the Centers for Disease Control and Prevention website, there has been an unprecedented rise in multiples birth rates over recent decades (Centers for Disease Control and Prevention, 2009). The growing number of twins has led to the creation of a national Twins Day held annually in Twinsburg, Ohio as well as several organizations like the National Organization of Mothers of Twins Club (NOMOTC).

The motivation for this study comes from our society's representation of twins. There are media stereotypes of twins, portraying them as having telepathic powers or a sixth sense between them. There is a perception in our culture of the good twin and the bad twin, typically associated with a type of monozygotic (MZ) twins commonly referred to as identical twins. MZ twins share the same DNA and look exactly alike, making it hard for people to differentiate each one. In the United States, popular movies and television series such as Disney's *The Parent Trap* (1961, 1998) and *The Suite Life of Zack & Cody* show these twins dressing alike, causing mischief, and pretending to be the other sibling.

In our culture's popular literature, there are several non-fiction and fiction books featuring twin siblings; for example *Guinness World Records* shows the oldest living, the smallest, the tallest, and the heaviest set of twins. Tweedledee and Tweedledum are a set of identical twins in the children's book *Alice's Adventures in Wonderland*. Cultural references to twins can be found in other parts of the world like ancient Rome. Romulus and Remus are mythological twins who disputed over land, leading Romulus to kill Remus. Esau and Jacob are famous twins from the *Old Testament* whose struggle led to a life and death situation. Astrological and Zodiac signs depict this unique sibling relationship, labeling those born between May 22 and June 21 as Gemini, "The Twins." There are other modern day artifacts featuring twins such as the Minnesota Twins baseball team, Twinkies desserts, and the town of Twinsburg, Ohio. Twin siblings have fascinated societies for thousands of years and continue to fascinate modern day societies. Thus, it was surprising to learn that studies focusing on twin siblings have received only a small amount of attention from family communication scholars.

The modest amounts of studies within the literature on twins investigate this sibling relationship with the main focus on genetics. Family communication scholars and researchers in related disciplines tend to show interest in comparing twin siblings to address questions of nature versus nurture. A majority of these studies rely on self-reported data; thus, it is important to review some of the empirical research findings.

Researchers have found that genetic and environmental influences on twins help explain their interpersonal affiliation, aggression, and social anxiety (Beatty, Heisel, Hall, Levine, & La France, 2002). In one of the more provocative meta-analytic studies, Beatty et al. (2002) compared monozygotic (identical) and dizygotic (fraternal) twins in terms of genetics and

environmental influences on communication since monozygotic twins are genetically identical, whereas dizygotic twins share only 50% of their genes on average. The 40 self-report studies revealed that interpersonal affiliation was 70% heritable, aggression was 58% heritable, and social anxiety was 65% heritable, indicating a need for further exploration of possible genetic influences on communication variables (Beatty et al., 2002). Given that biological siblings, particularly twins, are genetically bound, and typically raised in the same environment, Horvath (1995) wondered whether genetics might play a role in how siblings communicate. Her study focused particularly on identical (monozygotic) and fraternal twins (dizygotic) to determine if communicator style is inherited. The self-report results from twins whose ages ranged from 11 to 76 revealed a predictable relationship between communicator style and temperament, indicating identical twins as more closely related than fraternal twins in almost every variable. These findings suggest that sociability, activity, fearfulness, distress, anger, openness, relaxation, dominance, and communicator image are most likely to be inherited attributes. Beatty, Marshall, and Rudd (2001) produced similar self-report findings. They studied communicative adaptability among twin siblings whose mean age was 42 and identified particular communicative adaptability traits as inherited. Social composure was found to be 88% heritable, wit was 90% heritable, and social confirmation was 37% heritable. Conversely, it was found that articulation ability and appropriate disclosure were 0% heritable, "indicating some effect of shared environment" (Beatty et al., 2001 p. 372). Hazel, Wongprasert, and Ayres (2006) investigated similarities among fraternal and identical twins across four communication variables—communication apprehension, willingness to communicate, communication competence, and argumentativeness. The four hypotheses suggested that identical twins would be more similar in regard to each communication variable. The self-report results, however, did not support the hypotheses. There were almost matching correlations between fraternal and identical twins, ages 18 to 63 years, on all four variables (Hazel et al., 2006).

The purpose of this study is to examine naturally occurring conversations between twin siblings, analyzing patterns in their everyday talk. Our culture continues to express its interest in this type of sibling relationship, creating commercials, sitcoms, and movies depicting the life of twin siblings. There are phrases in our everyday vernacular that pertain to twins such as "It must have been my evil twin" or "They are joined at the hip." In fiction and folklore, the German term *doppelganger* is used to describe someone who looks identical to another person. Thousands of members of the social network Facebook participate in a celebrity doppelganger week, posting a profile picture of celebrities they resemble. Our culture is fascinated with twins and its interest in twins will continue to escalate. The birth of twins is on the rise according to the CDC (2009), stressing the need for further research on this subset within the family unit.

Family communication research can benefit from learning about twin-to-twin talk and its effect on the family unit. Segal (1990) argues, "The family members of adult monozygotic twins are related to one another in unique fashion. The children of MZ twins, while biological first cousins, are also genetically equivalent to half-siblings because they share a genetically identical parent" (p. 613). Learning how twins communicate with one another can benefit those who interact with them as well as those who have a twin sibling. Effective communication assists with healthy relationships; this is why it is crucial to study twin-to-twin talk. With twins becoming more prevalent in society, people are more likely to encounter and interact with them. Teachers, neighbors, friends, parents, siblings, and extended families can benefit from insights

into the communication of twins. The increase in numbers of twin births, our cultural fascination with multiple births, the shortage of studies on sibling dyads, and the need for researchers to examine naturally occurring conversations are a few reasons why analyzing talk between twin siblings is necessary and significant to the area of family communication research and related fields. The goal of this study is not to generalize the findings. It is to present patterns of conversational activities specific to these sets of twin siblings. Communication is vital to all types of relationships; nonetheless, it is an important topic to study among twin siblings. Thus, I pose the following research question: What communicative patterns are occurring in everyday talk between twin siblings?

METHOD

It is important to point out that a majority of the communication studies of twin siblings, as well as siblings in general, have relied on self-report data from one participant (Beatty, Marshall, & Rudd, 2001; Bevan & Hale, 2006; Bevan & Stetzenbach, 2007; Floyd & Parks, 1995; Hazel, Wongprasert, & Ayres, 2006; Horvath, 1995; Lee, Mancini, &Maxwell, 1990; Martin, Andersen, Burant, & Weber, 1997; Myers, 2001; Myers, Brann, & Rittenour, 2008; Myers & Bryant; 2008a; Myers & Bryant, 2008b; Myers & Goodboy, 2006; Myers & Knox, 1998; Myers & Weber, 2004; Rauer & Volling, 2007; Rittenour, Myers, & Brann, 2007; Strom & Aune, 2007). In order to identify and better understand potential communication patterns of natural talk between these unique siblings, conversation analysis is the chosen methodology.

Conversation analysis is a methodology that collects natural instances of talk and transcribes these instances for further analysis. An advantage of conversation analysis is that the likelihood of misrepresentation of communication is lessened because it is taped, transcribed, and played for groups of participants to check for transcription reliability. Conversation analysis data collection tends to occur in a more natural environment than laboratories, making the data less susceptible to researcher influence. One of the principal creators of this field, Emmanuel Schegloff (1997), argues, "ordinary talk-in-interaction…offers us leverage. The interaction embodies and displays moment-to-moment the products of its own endogenous mechanisms of interpretation and analysis, both of the utterances and actions which compose it and of the oriented-to context" (p. 184). Conversation analysis provides the researcher a valuable opportunity to study instances of natural communication. Studies that employed self-report measures did not involve analysis of any actual communication; rather, participants recalled interactions and provided information based upon their recollections. Conversation analysis recognizes all parties in a relationship by capturing their verbal interaction. In order to study communication, it is crucial for researchers to analyze the actual interaction instead of relying on participants' recollections or perceptions.

Schegloff (1997) argues that conversation analysis stays true to actual speech, privileging spoken words and avoiding *a priori* assumptions:

> And because it is the orientations, meanings, interpretations, understandings, etc. of the *participants* in some sociocultural event on which the course of that event is predicated—and especially if it is constructed interactionally over time, it is *those* characterizations which are privileged in the *constitution of socio interactional reality*, and therefore have a prima facie claim to being privileged in efforts to *understand* it. (p. 167)

In other words, conversation analysis does not attempt to psychoanalyze the participants. It investigates what the participants are "doing" in their interactions. Conversation analysis relies on evidence (tapes and transcripts) to determine what is happening or unfolding instead of making assumptions (Schegloff, 1997). It allows researchers the opportunity to investigate naturalistic conversations on audio or videotapes. The researcher transcribes the conversation, providing transcripts that are a visual representation of the participants' talk. After the transcriptions are completed, it is the job of the researcher to analyze and uncover what is happening in the conversation. In the present study, conversation analysis provides the opportunity to capture and analyze naturally occurring talk between twins in the privacy of their homes. Audiotapes were used as a less intrusive and less intimidating means of collecting data than videotapes.

TABLE 1.1 TWIN SIBLING PARTICIPANTS

Names	*Initials*	*Age*	*Twin Type*	*Sibling(s)*	*Parent(s)*
Bob and John	B & J	10	DZ	N/A	Both
Brad and Mark	B & M	10	DZ	Sister age 12	Mother
Collin and Kevin	C & K	12	MZ	Brothers ages 7 & 3**	Father*
David and Hudson	D & H	13	DZ	Brothers ages 20 & 14	Both
Brittney and Natalie	B & N	14	DZ	N/A	Mother
Amy and Sydney	A & S	15	MZ	Brother age 26 Sisters ages 23 & 19	Mother

Note. *Indicates single-parent; ** Indicates half-sibling on maternal side

The study includes six sets of twins from a rural Midwest school district who volunteered by responding to an approved letter sent to parents of twins (see Table 1.1). There was no preference as to the types of twins—monozygotic (MZ) or dizygotic (DZ)—since this study is not interested in biological comparisons, although they will be noted.

RESULTS

There were patterns of conversational phenomena consistent among the participants that are not discussed in twin research. Two particular patterns of interest here are what I call (1) testing and (2) speaking for one's twin. For the purpose of this study, *testing* is a term used to describe instances of interactions where one twin is challenging or eliciting information from the other regarding social information and/or answers to homework questions. The twin sibling who initiates the testing sequence does not always know the correct answer to his or her question. In the excerpts, the testing sequence typically happens in the following order: testing question, participant answer, and assessment of answer. There are also instances of indirect testing, which will be discussed in the analysis of the following excerpt. Twin brothers Bob and John are at the dinner table with their mother. Initially, John and Bob engage in indirect testing regarding a classmate who recently moved to a nearby town. This excerpt is an example of indirect testing because Bob does not directly ask his brother for an answer, yet John responds.

Excerpt 1.1: M (Mother); B (Bob) & J (John), twin brothers, age 10

→34	B:	Doug (inaudible) left
35	J:	No he didn't
36		(3.0)
→37	B:	How much you wanna bet (goober)
		[
38		((noises))
39	J:	That's awesome
40	B:	He barely even knew you
41	M:	Where did- he moved to Lincoln right?
42	B:	Bolivar
43		(1.0)
44	J:	Yes I did. (.) I just didn't hang out with him as much as you did
→45	B:	What was his last name
46	J:	Long.
→47	B:	What?
48	J:	It is <u>Long</u>?
49	B:	Wise.
50	J:	<u>WISE</u>! Dang it! I was thinkin' Adam Long

In line 34, B begins a sequence of indirect testing, stating that Doug moved. He is talking at the dinner table to M while J is present. In this excerpt, indirect testing follows this order: speaker comments, an unsolicited recipient responds, and initial speaker replies. In line 35 J self-selects to speak, disagreeing with B's initial claim. J's disagreement leads B to challenge him to a bet, implying that B is certain of Doug's whereabouts. In line 39, J's utterance violates Grice's (1975) maxim of relevance because he does not provide B with a relevant response. In line 45, B initiates a testing sequence, asking J to provide Doug's last name. J responds to B, stating "Long," starting the XXYY repair sequence (X is the repairable, Y is the repair). B elicits clarification, uttering "What" in line 47. J responds with an emphasis on "<u>Long</u>" (second X) with rising intonation: "It is <u>Long</u>?" J's emphasis on the last name with rising intonation gives the appearance that J is unsure of his answer. In line 49, B engages in an other-initiated repair, providing the correct last name (Y). J responds to B's repair, uttering "Wise! Dang it! I was thinkin' Adam Long" (Y). J's emphasis on the name "Wise!" followed by "Dang it!" implies that he knew the correct answer and still failed the test. J's echo of the correct name confirms to B that J agrees with him. J's interjection of "Dang it!" displays both an appreciation response for B's correct answer and a marker of his disappointment with himself. J then offers an account for his incorrect answer, showing B and M that he was confused.

This excerpt provides valuable insights into B's and J's relationship through indirect and direct testing. B is able to display his knowledge of information even though J disagrees with him twice. This leads B to engage in testing three times with J in lines 37, 45, and 47. Based on the testing sequences in this excerpt of talk, B's and J's utterances appear to show competitiveness between them. Testing sequences initiated by B imply he is engaging in deidentification from his twin. Line 41 provides an example of B's deidentification: "He barely even knew you." This utterance implies to J and M that Doug is B's friend, not a mutual friend of B and J. Throughout the rest of the excerpt, B provides evidence through his testing sequences that Doug is his friend.

Siblings (twin and nontwin) experience many "references," and search for their own identity (Watzlawik, 2009). Social comparisons can lead siblings to identification or deidentification. Identification occurs when siblings have something in common with one another, strengthening each one's own position—"We are special" (Watzlawik, 2009). Deidentification is when siblings search for their own niche or uniqueness to avoid comparisons and to minimize sibling rivalry/competition. Watzlawik (2009) conducted a study of sibling identification and deidentification of twins (MZ and DZ) and nontwins. Dizygotic twins (same-sex and opposite sex), same-sex siblings, and opposite sex siblings tend to name more differences (character traits, looks, and athletic abilities) than similarities (interest and shared abilities/activities). "Despite all the similarities between the different groups of siblings, monozygotic twins prove to be a special case. They do not seem to overidentify with one another, but they show less deidentification" (Watzlawik, 2009, p. 576). Watzlawik (2009) argues that monozygotic twins may have more difficulties finding their individual niches. Watzlawik (2009) provides a motive for the occurrences of testing between B and J. In this excerpt, B's testing sequence contributes to the sense of competiveness in his utterances towards J.

In this excerpt of talk, Collin tests his brother Kevin about answers to math problems while their father is present. Their father also engages in a testing sequence with Kevin.

Excerpt 1.2: F (Father); C (Collin) & K (Kevin), twin brothers, age 12

→1	C:	What is 42 divided by 7?
2	K:	In Missouri I'll punch your tooth
→3	F:	What is 42 divided by 7?
→4	C:	6=
→5	K:	=42 divided by 7 is 8
6	F:	((laughs))
7	C:	((laughs))
8	F:	Nice Kevin
9	K:	((Laughs)) I know, I'm quick
→10	C:	Have you ever got off in the gold yet?
→11	K:	Yeah, what comes first? 6?
12	C:	I'm a full <u>crate</u> ahead of you already
13	F:	A whole what?
14	C:	Okay, it goes (.) it goes multiplication through nine (.) multiplication
15		through twelve (.) division an then addition subtraction addition=
		[
16	K:	Through twelve
17	C:	= subtraction addition addition keep on multiplication till 12 through=
		[
18	K:	Collin's on a—I'm on a
19	C:	=9
→20	F:	So, you're further ahead than he is?
→21	K:	No
		[

→22	C:	Yeah it goes-
23	K:	No no he's on multiplication 9
		[
24	C:	Multiplication 9 is the last one
		[
25	F:	You little liar
26	K:	Multiplication 9 is first multiplication 12 is second addition is next
27		he's on addition I'm almost on multiplication 9
28	F:	So, that means you're going on fourth crate?
29	C:	Yeah
30	F:	Perfect
31	C:	No no it's not
32	F:	You gonna pass fourth crate?
33	K:	Oh yeah like 8 times 7 is-
→34	F:	What is 8 times 7?
→35	C:	60 um 72?
→36	K:	<u>Wrong</u>!
→37	C:	63
→38	K:	<u>Wrong</u>!
→39	C:	((laughs)) 56?
40	F:	Hey, there's half the job
41	K:	Heck yes
42	F:	Yeah I figured that, do you actually think about or you just repeatin' what
		[[
43	K:	((laughs))
44	C:	He seriously tries
45	F:	you heard ((performing C)) 72, 56, 87
46	K:	((laughing))
47	F:	((performing C)) Whatever they're all somethin' they're all numbers
48	K:	((giggles)) Yeah
49	F:	((performing C)) Pick which one you like
50	K:	((laughing))
51	C:	My friend- ((giggles)) my friend that is seventh partner he walks by me an
52		goes "Your brother failed again" I'm like "yeah I know"

In line 1, C begins the testing sequence with a math question. K speaks in the appropriate turn slot; however, it is uncertain who his response is directed to. If K is responding to C, K's utterance is play-fighting, violating Grice's conversational maxim of relevance. Levinson (1983) posits that one of the most important ideas in pragmatics is the notion of conversational implicature, a theory developed by Grice. According to Grice's (1975) theory, conversation should follow four basic maxims: quantity, quality, relevance, and manner. Quantity refers to making your contribution to the conversation as necessary without adding more information than solicited. Quality is speaking the truth, including not speaking of anything for which you lack adequate evidence. Relevance is simply saying things related to the topic of the conversation.

Manner pertains to being orderly, brief, avoiding obscurity of expression, and avoiding ambiguity (Grice, 1975). If K is not responding to C, then his utterance is directed to F.

Line 1 occurs at the beginning of the audiotape, making it difficult for the participants to recall their prior talk. In line 3, F repeats C's question, engaging himself in the testing sequence. Once F asks the question, C offers his answer in line 4. C is answering for his twin, which is another conversational phenomenon discussed later. It is apparent that F's question is directed to K because C asked the same question of K in line 1. In line 4, C's utterance displays the following: his knowledge of math, his opportunity to answer for his brother, or both. K latches onto C's answer with an incorrect response, causing F and K to laugh. Hopper (1992) states, "In these transcriptions latching [=] indicates a TRP (transition-relevance place) that gets rush-through" (p. 135). "Rushing-through is commonplace and not always entirely competitive, but if it happens repeatedly, its user may hog the floor" (Hopper, 1992, p. 135). K seems to know that C will answer the test question, which is evident by K's rush-though in line 5. In lines 6 and 7, F and K are engaging in shared laughter. Glenn (2003) states, "In two-party situations, *laughing at* is not shared. Thus two-party shared laughter will likely be a *laughing with*, while multi-party laughter may be *laughing with* or *laughing at*" (p. 113). In this sequence, F and K are exhibiting *laughing at* because there are three people in the interaction. K is laughing at himself because he quickly provided the correct answer as if it was the right answer.

In line 10, C displays testing when asked where K is ranked in his math level. Testing describes instances of interactions where one twin is challenging or eliciting information from the other regarding social information and/or answers to homework questions. C's question functions as a way to "call out" K on his abilities in front of F. K answers him, displaying uncertainty about the correct level. This is evident when K asks C a question for verification. In the following line C asserts his math level, stating "I'm a full crate ahead of you already." C's use of the word "already" implies that C has surpassed K in math rankings. "Crate" is a term implemented in this math class to assess the abilities of students, and is used in place of words such as level or grade. F is not familiar with the use of the word crate, which is evident by the repair request in line 13. In the following line C explains to F how the crate system works, displaying to F that C is credible to discuss the rankings. C begins with the word "Okay," which functions as a next turn acknowledgment and continuer (Filipi & Wales, 2003). It is evident that K is not credible, because in line 11 he asks C which crate comes first.

Lines 20 through 23 are shown because they display the conversational practice of simultaneous speech. F asks C a question about his math level; however, K and C answer simultaneously, offering different responses. K answers for C, which is an example of the communication phenomenon presented later in the study—speaking for one's twin sibling. In line 33, K begins to answer his own math problem instead of responding "yes" or "no" to F's question. Since K did not provide an answer to his own math question, F engages in testing, asking K for the correct response. K provides an incorrect answer and C is quick to assess K, emphasizing the word "wrong." Pomerantz (1984) posits that assessments are "products of participation" (p. 57). They allow the speaker to demonstrate his or her knowledge of what is being assessed, identifying the participant as a knowing participant. In this instance of testing, F asks the question to K, K answers the question, but C provides the assessment of K's answer instead of F. In lines 37 and 38, K answers the question and C assesses it with emphasis, "wrong!" C's

responses to K imply that C knows the correct answer and is willing to display his math abilities. K uttering the incorrect answer twice reinforces the perception held by F and C that K is not as strong in math as C. In line 39, K laughs before stating the correct answer with rising intonation. F jokingly states, "Hey, there's half the job." F's sarcastic response appears to imply a negative assessment of K's own effort in learning math. It appears that F is expressing to K that F knows he is not fully participating in class. K responds, verifying F's implication about K's math skills and/or lack of effort in the class. In line 42, F confirms his assessment of K's lack of interest, effort, or ability to do well in math.

In lines 42 to 44, K laughs at F's utterance and C offers his account of his brother's abilities. Accounts are face-saving practices used to attempt to repair or mitigate discrediting dimensions of an event. They are corrective mechanisms in communication (Buttny, 1987). C's utterance expresses to F that K does try in math instead of guessing at the answers. In line 42, F questions K in regard to whether he is "thinking" or "repeating" answers. F's question displays his preference for K to explain himself instead of C adding his own account of K's performance. K responds to F with laughter, indicating K is not offended by F's utterance. In lines 45 and 47, F engages in the conversational performance act of role-switching (impersonation, mimicking). F changes his voice, mimicking K, and utters projected (future) quotes. F's impersonation could function as a teaching moment for K. F's projected quotes expresses to K his (K's) own attitude towards math. The content and prosodic features of F's delivery indicates that he is engaging in a sarcastic impersonation of K. Through F's impersonation, F is able to convey to K how K is presenting himself. This impersonation may or may not have an effect on K's participation in math. In line 46, K giggles and adds a minimal response (Crow, 2007), implying he is not upset with F's impersonation of him.

K's utterance displays a nonverbal acknowledger (giggles), and a minimal response which lets F know that K is handing the floor back to F. In line 49 F continues his role-switching, adding "Pick which one you like." K responds with laughter, and C engages in reported speech. Reported speech is characterized as quoting another person's, or one's own, prior words. It can take the form of a direct quotation (quoting exact words of the original speaker) or indirect quotation (a summary of the interaction in the words of the teller) (Holt, 1996). Reported speech can also be "double-voiced discourse," meaning the original and the present speakers are reflected in the narrative (Buttny, 1998). In lines 51 and 52, C elaborates on K's math skills, providing evidence of K's recent performance on a math test through reported speech of a classmate. C's utterance displays the following: K is bad at math, a classmate provides this assessment to C, and C confirms the classmate's assessment.

This excerpt of conversation highlights the notion of testing between twin siblings in the presence of and with active participation by a parent. Throughout this excerpt, F reinforces his assessment of their differing math skills without disagreement from either twin. K is confirming, in this excerpt, his role in the family as the stereotypical "dumb jock," whose main interest is in sports. This appears to be K's role in the family, which F confirms and K exhibits in the conversation. Some family roles enacted by children are formal (created by society) such as stepchild, son, and foster child. There are also informal roles (created by families) for children, which consist of the silly child, the jock, and the brain (Socha & Yingling, 2010). K appears to function in the role of the jock, whereas C appears to enact the role of the brain.

The next excerpt of talk illustrates the conversational phenomenon of speaking for one's twin with a parent present. The conversation takes place in a minivan where their mother directly asks Natalie questions but her sister, Brittney, also answers.

Excerpt 2.1: M (Mother); B (Brittney) & N (Natalie), twin sisters, age 14

50	M:	Natalie how did your boat do
51	N:	It didn't go up past-
		[
→52	B:	It didn't go all the way
53	N:	It went—it went (.) it was off by this much ((nonverbal))
		[
→54	B:	She tried it twice too
55	N:	Just to show you how far we got mine
56	B:	You know what just because my Daddy doesn't make my=
		[
57	M:	Did you fail (.) did you fail (.) did you fail
58	B:	=project doesn't mean
		[
59	N:	Oh
60	N:	No I had a hundred on everything else
		[
→61	B:	She got (.) it was only minus twelve (.) it was like
62		worth a hundred an five points
		[
63	N:	What'd ya- what'd ya- what'd ya get on your social studies
64		test
65	B:	I don't know I didn't have to take it 'cuz ah seventh eighth hour I never
66		saw her so then what do you do

The excerpt begins with M addressing N, asking N about her boat project. In line 52, B interrupts N, recasting her sister's utterance by elaborating on N's narrative. This is the first example of B speaking for her twin. B's utterance is considered as an interruption, not an overlap, for the following three reasons. First, M explicitly addresses N, instead of asking, "How did your boat do?" The pronoun "your" would imply that either sister could answer their mother's question because of the absence of an address term. West and Zimmerman (1983) explain two criteria for an overlap: "(1) The overlap must begin at least two syllables from any transition-relevance place in the current turn unit. (2) The overlapping utterance must not support or facilitate the current speaker's utterance" (p. 104). B joins the conversation at a nontransition-relevance place, making her turn an interruption.

In line 54, B recasts her sister's utterance followed by an elaboration of N's narrative. This implies B is supporting and facilitating her sister's response, confirming B's utterance as an interruption. N does not complete her utterance because she is cut-off by B, violating N's completion right. In this instance, N does not finish her thought because her sister, B, interrupts her utterance. B's negative assessment, "It didn't go all the way," is a type of competitive

behavior labeled as a personal criticism (Littlejohn, 1996). B implies a negative evaluation of N's participation in the project. B's interruption conveys her intent to take over the floor, which is a competitive move.

In line 53, N continues her narrative as B overlaps, adding her assessment of N's performance to their mother. This is the second example of B speaking for N, which is a competitive overlap. B's overlap (line 54) is competitive because it does not occur near a TRP. B is informing M that N had two unsuccessful chances to reach the finish line. The content and delivery of B's utterance is competitive in nature; B is criticizing N's performance. N's absence of an acknowledger implies that she is ignoring B's utterances or cannot hear B's responses in the van. In line 55, N says, "Just to show you how far we got mine," indicating that their mother did not observe her initial nonverbal representation. This implies that N is sitting in the front passenger seat of the van. It would be distracting for their mother to drive while watching N if she was in the back seat. N uses the word "we"; however, it is evident in the following line that "we" does not mean N and B. If B participated with N in the boat project, it would not seem logical for B to utter a demand ticket in the following line. Nofsinger (1975) defines a demand ticket as, "those utterances which seem to refer to some unidentified statement (e.g., "Guess What?" or "Yuh know something?"), and those which use a name or title as a summons (e.g., "Jo Anne?" or "Mommy?")" (p. 2). B's utterance is a type of competitive behavior labeled as a presumptive attribution. Littlejohn (1996) defines presumptive attribution as, "attributing thoughts, feelings, intentions, and causes to the partner that the partner does not acknowledge" (p. 276). B is implying that their dad built (or helped with) N's project but not B's project; however, N does not acknowledge or deny B's claim.

In line 57, M rejoins the conversation, asking a second question directed to N. Their mother's repetition may function as a means to direct N's attention away from her sister's criticism. Her interruption of B's utterance is a power move to gain the floor, displaying her dominance in the parent-child relationship. Parents have the power to manipulate consequences; they can reward or punish their children (Littlejohn, 1996). M has not responded to B, implying that she is punishing B by not acknowledging B's utterances. In line 59, N acknowledges her receipt of their mother's question with "Oh." N's delayed response to their mother indicates that she was listening to B's utterance of lines 56 and 58. Heritage (1998) says: "In responses to English questions, prefacing with the particle *oh* indicates that, from the viewpoint of the answerer, a question is problematic in terms of its relevance, presuppositions, or context" (p. 291). N's "Oh" indicates that her sister's utterance is problematic in terms of presupposition or relevance to the topic. N does not confirm or deny their dad's participation in the construction of her boat, making B's utterance irrelevant. In line 60, N is informing their mother of her score on the project as B interrupts, speaking for her twin for a third time. B's utterance (line 61) contradicts N's response, implying competitiveness towards her sister. B is reporting to their mother that N is incorrect regarding the calculation of the final grade. In line 62, B continues her utterance while N interrupts in line 63. N displays competitiveness as she interrupts B at a non-TRP. N self-selects to speak, eliciting information from B regarding her score on the social studies test. This is the first time in the excerpt that B has been acknowledged. N's utterance gives the appearance of competitiveness, implying to their mother the following: B did not take the test or B did not perform well on it. B ends the excerpt of conversation, justifying why she did not take the test: "I never saw her so then what do you do."

The interaction among N, B, and their mother provides interesting information and examples of speaking for one's twin. There are three people in the car, yet N and her mother only converse with each other. B interjects her account of N's boat project without acknowledgment from N or their mother. In fact, their mother does not acknowledge B throughout the excerpt. On the other hand, N acknowledges B in line 63 where she shifts the topic of conversation to B's performance on the social studies test. B's utterances in the excerpt are competitive: she disagrees with N's accounts, she criticizes N's assistance from their father, and she criticizes N's grades. B's criticisms towards N lead their mother to ask another question, functioning to shift the attention back to N before a conflict erupts between the sisters. M interrupts B, repeating her question (three times), regulating the conversation by shading the topic back to N. Shading is when a new topic emerges out of the old, demonstrating competence in maintaining the conversation (Crow, 2007). Their mother is enacting the role of arbitrator without explicitly asserting herself. She is indirectly impeding a potential conflict between the sisters. "In some cases, a sibling conflict may occur in the presence of one or both parents, and they may decide whether to become involved. Interestingly, not all parents choose to do so" (Roloff & Miller, 2006, p. 153).

Systems theory explains the interaction occurring between parent/child and sibling/sibling relationships. "The structural model provides a clear framework to understand the subsystems of the family and the interactions of these subsystems in terms of social organization" (Jennings & Wartella, 2004, p. 598). Hierarchy and interdependence are two properties of systems theory present in the excerpt. During the excerpt of conversation, N and her mother are interacting in their mother/daughter subsystem in the presence of B. Within every system, there is a hierarchy of subsystems affecting the family. N and her mother are conversing as if B was not in the van, which might explain why B displays competitiveness in her utterances. "Although early research focused on sibling rivalry as a cause of sibling conflict, recent research suggests that causes may simply reflect interdependency" (Roloff & Miller, 2006, p.153). This interdependency present in N's and B's twin sibling relationship contributes to their conflict.

According to Turner and West (2006a), systems theorists posit that family members are interdependent, and conflict occurs in interdependent relationships. It is rare for someone to express disagreement with an individual they do not depend on in the same way as family members (Turner & West, 2006a). Their mother's lack of acknowledgment towards B could function as a means to connect with N, fostering their mother/daughter relationship. Or, their mother recognizes B's utterances as competitive and ignores her as a means of silencing B. N's and B's sibling subsystem is evident in lines 63 to 66 where they interact with each other. N's question to B implies competitiveness: "What'd ya- what'd ya- what'd ya get on your social studies test." If N thought that B took the test and/or did well on the test, she most likely would not have inquired. It is interesting to note that N does not respond to B's prior utterances; however, B immediately responds to N when asked a question. B's immediate response confirms that she was seeking attention from N in the conversation. In this excerpt, the conversational phenomenon of speaking for one's twin functions as a means of competitiveness with the goal of gaining attention from M.

The next excerpt is also an example of the conversational phenomenon of speaking for one's twin. The conversation takes place in the kitchen where David and Hudson are having a conversation on the topic of sleep.

Excerpt 2.2: D (David) & H (Hudson), twin brothers, age 13

3	H:	So David?
4	D:	Yes
5	H:	Why aren't you- why are you so tired
6	D:	I don't kno:::w
→7	H:	Like 'cause he slept pretty well last night an woke up=
8	D:	=I know, slept well
9	H:	What?
10	D:	I know, slept well
11	H:	You always slept well?
12	D:	I KNOW. I. SLEPT (.) WELL!
13	H:	SORRY! BUT YOU WEREN'T TALKING CLEARLY
14	D:	I was talkin' perfectly clear to me anyway
15	H:	No you weren't
16	D:	Yes I was
17	H:	Don't talk with your mouth full
18	D:	It's not full there's still room in my mouth
19		((sniffles))
20	H:	Don't talk with food in your mouth

In line 5, H engages in a self-initiated repair, reformulating his question. D offers an ambiguous response, violating Grice's (1975) maxim of manner. According to Grice (1975), the maxim of manner says avoid obscurity of expression, avoid ambiguity, be brief, and orderly. D replies, emphasizing the word "know" in a tired-sounding way. The instance of speaking for one's twin occurs in line 7. H speaks for D, providing an assessment, using the pronoun "he" instead of "you." The use of "he" indicates H is speaking to their mother on behalf of D; however, there is no third party response. D's ambiguous response (line 6) is a violation of Grice's maxim of manner. D's violation serves as a reason why H decides to speak for D. In line 8, D immediately responds, latching onto H's utterance at a TRP, or a moment at which speakership is available (Hopper, 1992). Paul ten Have (1999) says that latching occurs "when one spate of talk directly follows another, with no gap between the two" (p. 88). D's latching (indicated by the equal signs) signifies agreement. H's role as the "chatty twin" could be another explanation as to why he speaks for D. This is made evident by H's topic initiation in line 3, H's inquiry to D in line 5, and H's conversation repairs in lines 9 and 11.

Line 12 is where D expresses his agitation towards H's inquiry in line 11. This is apparent through D's emphasis of words and raised voice. H apologizes to D with a raised voice, emphasizing his words. This is where the topic of conversation shifts to the meta-topic of speaking clearly. D does not accept H's insincere apology, and justifies his lack of clarity in his speech in line 14. D's response is a competitive behavior which is labeled as a denial of responsibility. Littlejohn (1996) defines this type of competitive behavior as, "statements that deny or minimize personal responsibility for the conflict" (p. 276). In lines 15 and 16, H and D engage in a brief disagreement sequence. Brenneis and Lein (1977), who investigated child discourse, would say that H and D are engaging in an argumentative sequence called inversion. "Successive statements may be drawn in turn from a category and its inverse, or, in some cases, from a category and one other category which represents a denial or negation" (Brenneis & Lein,

1977, p. 56). H and D are displaying inversion between denial and affirmative statements. In line 17, H utters a directive on table manners to D. D responds sarcastically, leading H to initiate a self-repair of his prior directive, ending the disagreement sequence. D does not respond to H's last utterance, indicating that he is obeying his brother's final directive. H is taking on the role of "little parent" in a process known as parentification (Byng-Hall, 2008). This is interesting because the older sibling is typically involved with parentification; however, H and D are the same age. In lines 17 to 20, H enacts the role of parent, while D enacts his role as the baby or younger child.

This excerpt of talk provides an example of speaking for one's twin; however, it differs from excerpt 2.1 for several reasons. In line 3, H asks D why he is tired this morning. D provides an ambiguous answer, "I don't know," violating Grice's maxim of manner. The violation is one explanation for why H speaks for D in line 7. D does not provide a preferred (unambiguous) answer as the second part of the question/answer adjacency pair in line 8. H speaks once for D, leading D to respond immediately. D latching onto H's utterance could indicate agreement with H's assessment. Or, it could indicate that D wants to speak for himself. D shows his agitation with the topic of the conversation, stating in a louder voice, "I KNOW. I. SLEPT (.) WELL!" Systems theory provides insights as to why H speaks for D—family roles. Systems theory as a process model explains the importance of interaction and communication among family members. Family roles are allocated by members and/or created out of experiences in the family system. The family continues to grow and maintain itself through interdependency (Turner & West, 2006a). According to Turner and West (2006a), "each member's role enactments contribute to creating and maintaining the family. These principles give rise to the notion that family members will behave in ways that are needed by the system as a whole" (p. 126). In this excerpt, D appears to enact the roles of sensitive twin and baby, whereas H appears to engage in his roles of chatty twin and "little parent."

Speaking for one's twin revealed an issue worthy of further investigation: speaker interchangeability. On the tapes, parents and the siblings appeared comfortable with one twin talking on behalf of the other. It appeared as if the twins were treated as one person, speaking freely regardless of whom the question was directed to. In these excerpts (shown), only one parent used an address term that did not deter the other twin from speaking. This parent did not reprimand the twin or repeat the address term and question to signal the other twin to speak. Speaker interchangeability is worth examining to determine whether this is a common practice among twin siblings and/or siblings in general during family conversations.

In summary, the data did reveal communication phenomena that are not discussed in conversation analysis or family communication research: testing and speaking for one's twin. Testing is a label created for the purpose of this study to define the phenomenon present in the twin siblings' interactions. Future studies are needed to further investigate conversational patterns and phenomena as they relate to the unique twin siblingship. The purpose of this study is to report these findings as preliminary insights into twin siblings' everyday conversation; nevertheless, it is not to be generalized.

DISCUSSION

This study highlights twin-to-twin talk utilizing systems theory and pragmatics to better understand twin siblings as they communicate with each other. Systems is a crucial theory to apply in research on family communication because it focuses on the creation and maintenance of relationships through interactions. These twin participants displayed the following functions—role confirmation/enactment, twin identification/deidentification, and supportiveness/ competitiveness—through interactions with their twin sibling and/or parent. Systems theory was used to describe the influence family roles and twin identification have on relationships within sibling subsystems, other subsystems, and larger subsystems.

Pragmatics places emphasis on what is occurring within a conversation (conversational acts and sequences) and the importance of conversational structure, describing interactions without psychological assumptions. It made possible an objective description of the communication between interactants. The application of both theories offered the researcher an opportunity to discuss participants' communication as it contributed to the ongoing construction of the twin siblingships and relationships with parents. Roles are products of observations and experiences, and they can also be allocated by the family (Turner & West, 2006a). Intrapersonal role conflict internally occurs in a family member when his or her role is incompatible with his or her own self- perceptions. In the first excerpt of talk (1.1), B's utterances do not give the appearance of supportiveness; instead, they appear competitive in nature towards J. B's competitiveness is displayed after J's indirect testing of his knowledge in line 35.

The remainder of the excerpt shows B engaging in the following: challenging J to a bet, negatively assessing J's friendship with Doug, and initiating a testing sequence with J. B's testing could indicate that he and J are experiencing interpersonal role conflict. Interpersonal role conflict can occur when, "two or more family members wish to enact the same role behaviors" (Turner & West, 2006a, p. 125). B's testing sequence shows their mother that in this case B knows more information than his brother (i.e., the smart twin). B's utterances display that he is confident of his knowledge of the topic of conversation. Turner and West (2006a) claim that individuals have the capacity to drop a given role, pick up another role, or modify it. This begs the question whether their parents are indirectly or directly influencing deidentification between them. "Twins have more difficulties in developing independence and a positive identity than nontwins due to the fact they have to emancipate themselves from both their parents and cotwins" (Watzlawik, 2009, p. 562).

In excerpt 2.2, system theory provides insights as to why H speaks for D—family roles. Systems theory as a process model explains the importance of interaction and communication among family members. Family roles are allocated by members and/or created out of experiences in the family system. The family continues to grow and maintain itself through interdependency (Turner & West, 2006a).

According to Turner and West (2006a), "Therefore, each member's role enactments contribute to creating and maintaining the family. These principles give rise to the notion that family members will behave in ways that are needed by the system as a whole" (p. 126). D enacts the roles of

sensitive twin and baby, whereas H engages in his roles of chatty twin and "little parent." It is uncertain whether D's role as the sensitive twin is socially structured through his patterns of behavior, or is a role allocation by the family members. Both of D's roles are present in the excerpt, contributing to stability in the family system. D's role as the sensitive twin and/or baby explains why H speaks for him in the excerpt. D is not an extrovert like H, and H takes on the role of "little parent" when interacting with D. H's role of chatty twin is created and sustained in the interaction with D.

CONCLUSION

The implications of this study are that the conversation analysis approach to twin research offers more details on twin siblings' everyday communication patterns than self-reports. More scholars need to implement the conversation analysis approach, investigating communication practices that constitute family relationships (Turner & West, 2006a). Twin researchers in related disciplines need to learn about this new conversation analysis approach to twin talk. Their findings can contribute to this initial collection of twin sibling communication patterns in everyday talk. This study advocates the use of conversation analysis in the field of family communication, stressing the importance of natural occurring talk as data.

This study addresses Turner and West's (2006a) concern for more research on family relationships that have "remained relatively unexplored" such as the twin sibling relationship. Little is known about the nature of how adolescent twin siblings communicate with each other. This study reveals specific conversational practices and phenomena in the twin participants' interactions, yet it did not exhaust every practice and phenomenon. These initial findings are important because they offer a new understanding of twin-to-twin talk that was not previously available. There is still an abundance of undiscovered information regarding twin siblings and communication between them. This study does open up for discussion the notion that twin siblings do engage in specific communication patterns.

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