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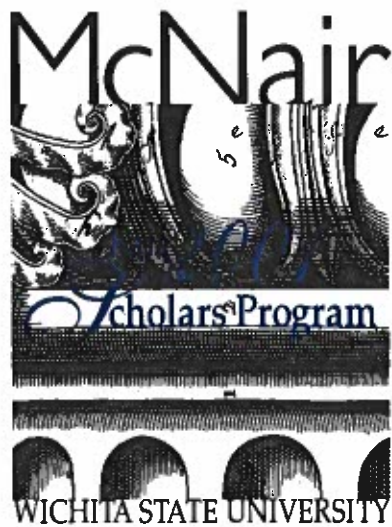
*"True courage
comes in
enduring . . .
persevering
and believing
in oneself."*

—Ronald McNair

WICHITA STATE UNIVERSITY



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E d i t o r

Jan Petersen

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F r o m t h e D i r e c t o r

 As I bring my first year as Director of this Program to a close, I am proud to present Volume 7 of the Journal of Research Reports. The articles featured in this journal represent the work of the Program participants from the 2001-2002 grant year. As one reads through these articles, it is clear that the breadth of research interests is a diverse one and the quality is outstanding. My staff and I could not be more pleased with the efforts to produce this meaningful and scholarly works.

The Program could not achieve such great accomplishments without the support of the University faculty and other professionals who have mentored students this past year. These mentors have not only guided the McNair students in completing their research projects, but have inspired them to unimaginable heights. All of the research mentors are to be applauded for their efforts in making undergraduate research a reality for the students in the Program.

A special word of thanks is directed to our research assistant, Jan Petersen. Her dedication to the Program and keen ability to motivate the students to produce the best possible document is greatly appreciated. Appreciation is also given to our writing tutor, Fariha Baloch, Program Counselor, Frances Ervin, and administrative assistant, Linda Lindsly, who without their support and persistence in making sure that things got done, none of this would have been possible. These individuals are invaluable.

Finally, I would like to congratulate the students for going beyond the classroom and putting their research interests into practice. Their efforts will not go unnoticed and will prove to be something that they can be proud of, as we are most proud of them and their accomplishments. These students are indeed an example for others to follow in the pursuit of academic attainment.

LaWanda Holt-Fields
Director

The Impact of the September 11, 2001, Terrorist Attacks and Managing Diversity in the Workplace: A Commentary

Pamaline King-Burns *WSU McNair Scholar*

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Abstract

This paper provides a commentary on the psychological and economical effects of the tragic events of September 11, 2001. The resulting impact on managing diversity in the work place is emphasized. Significant changes in the work place and increasing challenges for managers of companies are discussed. Despite the many changes and challenges in today's times, it is imperative that issues of diversity in the work place continue to be addressed.

The Impact of the September 11, 2001, Terrorist Attacks and Managing Diversity in the Workplace: A Commentary

Most people can recall exactly what they were doing when asked the questions, "Where were you when John F. Kennedy was assassinated? Where were you when Dr. Martin Luther King was assassinated? Do you remember what you were doing the moment the networks announced the assassination of Senator Robert Kennedy?" These tragic historical events are indelibly imprinted in the minds of Americans who were old enough to understand the nature of those murders. So it is with the series of terrorist attacks on America. The first of nineteen terrorist acts on the United States of America (U.S.) started in 1979, when Islamic students stormed the U.S. Embassy in Tehran, Iran, and held 52 Americans hostage for 444 days. The most recent terrorist acts occurred on September 11, 2001, when four American commercial airliners were hijacked and used to destroy vital American icons and to kill thousands of citizens. Of all the terrorist acts to date, the one on September 11th has been the most horrific. This paper provides insight on how these recent events may have affected Americans, psychologically and economically and, particularly, how recent events have affected managing diversity in the workplace. Inferences are drawn in this paper regarding the impact of the September 11th terrorist acts on effectively managing diversity in America's workplace.

Psychological Impact

On September 11, 2001, at 8:44 a.m. it was business as usual in the American workplace. Most adults were either working or on their way to work. Many children were in the safety of daycare or schools. The wheels of American politics and economics were gearing up for another day. Suddenly, life as many Americans knew it was no more; life in the United States (U.S.) was changed forever. America was attacked on American soil. The United States of America was no longer invulnerable. The entire world watched as two commercial airliners plunged into each tower of the World Trade Center (WTC). With horror, the world witnessed victims jumping from burning buildings to certain death below. Then, just as both burning towers of the WTC began to collapse, the news of two more hijacked American airliners was broadcast. Feelings of shock, fear, and a deep sadness prevailed as Americans began to realize that America was under attack. A look at informational technology and how quickly the news was dispersed helped to explain why people took this series of events so personally. Vast assortments of mediums were used that day to cover that particular event. Satellite network television, radios, e-mail, home phones, cell phones and personal testimonies, all contributed to up to the minute reporting. Thus, the nation was able to witness these tragedies as though they were themselves participating. Children in their classrooms witnessed the catastrophe on computer screens and televisions. People in the far reaches of the world watched as these horrific events unfolded. An immediate international outcry arose and many countries pledged to help the U.S. in their war against terrorism. Many of the victims who died in the World Trade Center and on those planes were literally from every nation in the world. Philanthropic agencies from around the nation quickly sent volunteers to help the rescue teams.

A full range of emotions surfaced in America. Patriotism, altruism, outrage, fear, confusion, sadness, and depression were just a few of the many varied responses throughout the country. Many Americans were angry and afraid. Many American citizens of Muslim faith closed businesses, left work, and went into seclusion as retaliatory threats were made on their lives and the lives of their families. Many Islamic students traveled together in small groups and were especially careful about where they went. While there was an outpouring of sympathy and love for the victims and their families, for others, there was outrage and hatred for the terrorists and for anyone who even slightly resembled

them. Many Americans continue to suffer from fear, depression, and a deep sadness that will not soon go away.

On the other hand, these tragic events have caused many Americans to pull together, supporting bereaved families and their own grieving loved ones. There has been a huge outpouring of sympathy and love by both the individual and by many philanthropic agencies. Many people are beginning to educate themselves concerning other cultures, especially the Islamic culture.

Economic Impact

The economical impact on America was devastating, swift, and widespread. The Federal Aviation Association (FAA) immediately shut down all air travel throughout the nation. For several days, travelers were stranded. They were forced to either find other means of transportation or remain where they were, hoping that air travel would resume soon. Within days, airlines lost billions of dollars and announced layoffs. A deluge of serious economic events began to take place. For example, one of the largest manufacturers of commercial aircraft in America, The Boeing Airplane Company, announced just one week later it would lay off 30,000 employees, a 30% reduction of its total workforce. According to company reports, as recently as June 21, 2002, seventeen hundred employees were laid off, with thirteen hundred more pending. Additionally, all travel-related agencies suffered huge economic losses. For purposes of security, airports no longer allowed curbside baggage assistance; therefore, those workers were laid off. Workers loading and unloading luggage on the airplanes were also laid off. Hotels announced cutbacks and travel agencies reported loss of business. People stopped traveling; they weren't shopping for pleasure; they weren't eating out. Many other types of American businesses suffering economic losses began to downsize. In addition, because American economics operate in a global marketplace, other nations were also going through economic crisis. Headlines around the world announced cutbacks. For example, BAE Systems of Manchester and Airtours, together, cut 2,900 of its workforce (Manchester Online News, 2001). Then came the threat of chemical warfare. Americans were now apprehensive about what might be in their mail, what might be in the foods they bought, where they shopped, and even their workplaces were suspect. The economic ramifications of the terrorist acts were and still are far reaching.

Diversity Management Impact

Diversity is not just race, gender, and age. Diversity encompasses culture, language, education, values, sexual orientation, and a plethora of unseen components. Effective diversity management is a process for addressing diversity in all of its dimensions, through affirmative action, understanding differences, and managing diversity collectively (Thomas, 1996). Thomas states that two of the tenants in the workplace for managing diversity are understanding cultural differences and promoting reciprocal adaptations. In this season of deep cuts in the American workforce due to the downsizing of many corporations, managers are dealing with issues regarding diversity in several dimensions. Manpower cuts have gone so deep that the result may be an aging workforce with no one to take the reigns when those workers reach retirement age. For example, the majority of the 30,000 people recently laid off from one large manufacturer are in seniority protected skilled trade jobs. The laid-off workers are young people new to the workforce, women, and minorities. These three groups have two things in common: they came late into the workforce and have, generally, been the first to go. This issue raises the question, will the remaining workforce become just a little too much like the "old days" in which minorities and women had to fight for inclusion in the workforce? In her book, *Diversity Blues*, Dr. Gladys Hankins (2000) states that institutional racism and sexism is solidly ingrained in workplace environments, covering an entire gamut of organizational elements in human systems, organizational structure, business practices, policies, values, goals, and principles, etc. Indeed, the White Anglo Saxon Protestants (WASP) occupied most high-paying, seniority-protected jobs in the 50's, 60's, 70's and 80's. Contractually, companies are obliged to layoff workers according to the agreed upon contract, but, as mentioned above, this practice places companies at risk when it comes time for those senior employees to retire.

In these challenging times, diversity issues must continue to be addressed. The same diversity management strategies should still be effective and should still be employed. Employees should still be empowered, and people should still be encouraged to work together in a team atmosphere. The culture of the workplace will change, and the strategy for success should evolve with the changes in culture.

Conclusion

The recent traumatic terrorist acts of September 11 and resultant war on terrorism indeed has affected the psyche of the American people. With the massive loss of lives and sense of safety, the emotional impact is evident and will continue for years to come. In addition, the economic impact of the terrorist attacks of September 11 is still being measured. The reduction of the workforce in the air and travel industry affected the aircraft manufacturing industry, which in turn affected its parts suppliers, which in turn affected the raw materials supplier, etc. Globalization of business means that any economic impact suffered here in the United States has worldwide ramifications.

These issues create significant concerns as deep reduction-in-force cuts may take some industries back to pre-Affirmative Action days. Soon a different set of diversity problems may surface and the diversity management strategies of many corporations will be challenged. Hopefully, lessons learned during the days of setting up and implementing diversity management strategies are not lost. If corporate America should forget the benefits of its workforce working together in diverse teams towards one goal, it will suffer great losses. America cannot lose the rich heritage that comes from the mutual adaptation of each culture. The strength and the competitive edge, which comes from people working together, must not be lost. Corporate America cannot afford to forget that its greatest resource is our diverse mixture of people working together.

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Thinking Outside the Box: Parental Solutions to Problem Behaviors of Children with Autism and their Applicability in the School Setting

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Abstract

Child rearing can be a challenge under the best of circumstances. However, those responsibilities can be particularly trying for parents of children with Autism Spectrum Disorders (ASD), who often must “think outside the box” to resolve their children’s problematic behaviors. Parents often acquire keen insight into likely triggers of problematic behaviors for their children, from the vantage of a primary caretaking role with long-standing experience. They also develop creative solutions at times with potential application in the school setting. Ethnographic interviews were conducted with 11 Kansas mothers to ascertain their educational goals for their children with ASD. Parents raised numerous behavioral issues during their interviews, which may or may not be related to the defining features of ASD. Problematic behaviors raised by the parents, and their solutions, are discussed.

Thinking Outside the Box: Parental Solutions to Problem Behaviors of Children with Autism and their Applicability in the School Setting

Autism Spectrum Disorders (ASD) are a collection of pervasive developmental disorders with a typically lifelong, devastating impact on individuals and those responsible for their care. Primary features include severely compromised communication and social interactions, restricted interests and activities, and stereotypic behaviors (American Psychiatric Association, 1994). No culture or socioeconomic class is immune to ASD; they are found worldwide and in increasing numbers (National Institute of Child Health & Human Development, 2001). Boys are afflicted more frequently than girls (3-4:1). However, among girls with ASD, defining features often are worse (Cohen, 1998). Mental retardation is fairly common among certain ASD subtypes, as are seizure disorders (APA, 1994). Although their cause is unclear, it is thought that ASD have neurobiological roots (National Research Council, 2001). To date, there is no cure. However, early intensive intervention may enable some children to develop specific skills, and medication

may help manage certain symptoms (National Center on Birth Defects and Developmental Disabilities, 2002).

According to the National Center on Birth Defects and Developmental Disabilities (2002) at the Centers for Disease Control and Prevention, “it is not known how many children in the United States currently have autism spectrum disorders” (p. 2). The Autism Society of America (2002) estimates there are between 500,000 and 1.5 million individuals with ASD nationwide. There was a time when autism was considered a low-incidence exceptionality. Currently, those numbers are increasing 10-17 percent annually, and autism is viewed as one of the most common developmental disabilities among children (Cohen, 1998). Reasons for this increase are not entirely clear. Some, but not all, of this change in prevalence may be attributed to expanded diagnostic criteria and to better awareness of these disorders among medical practitioners and the public.

Currently recognized within the collection of ASD are five subtypes: Autistic Disorder, Asperger’s Disorder, Childhood Disintegrative Disorder, Rett’s Disorder, and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) (APA, 1994). Differences among the subtypes essentially relate to the severity of the defining features, the age of onset, and whether there was an earlier period of normal development and cognitive functioning. Also, concurrent disorders such as epilepsy, mental retardation, and certain language delays occur at higher rates among this population (National Research Council, 2001).

One theory used to explain autism is “Theory of Mind” (Baron-Cohen, Leslie and Frith, 1985). Essentially, it posits that individuals with autism are unable to anticipate the actions of others because they cannot accurately interpret or predict perspectives beyond their own, particularly with regard to thoughts, feelings, attitudes, or emotions. Individuals with autism are unable to find a comfortable niche in relation to others, especially as it involves the natural ebb and flow of social interaction. They are unable to interpret or predict others’ perspectives accurately, and they may instead apply logic to explain in concrete terms actions that actually are rooted in emotion or personal preference. Even those who are highest functioning will still likely struggle with correctly “reading” emotional facial expressions or subtle gestures. Often, they misinterpret figurative language, joke punch lines, or lies in jest. Even those who fare well on social competency testing under controlled conditions will struggle to interpret others’ mental states in real life situations or under “demanding conditions, such as when there are time constraints, no visual cues, or in social situations with competing multiple stimuli” (Jordan, 1999, p. 66).

Behaviors

Individuals with ASD do not wear their disability on their face, and at first glance, behaviors in public such as dropping to the floor or running off screaming may be misinterpreted as simply the result of poor parenting skills. "However, even individuals who know little about autism will be able to identify children with autism as exceptional if allowed to interact and observe their behavior" (Simpson & Zoints, 2000, p. 13). No single set of behaviors can describe all individuals with ASD (National Research Council, 2001). Two individuals with the same diagnosis may present behaviors that are quite different, and even within the same individual, those behaviors may vary over time and among environments. Indeed, "one of the most striking aspects of the condition (or conditions) labeled 'autism' is its variability" (Cohen, 1998, p. 4).

In general, individuals with ASD struggle to interact appropriately with others, and it is not uncommon for them to withdraw into isolation. Those who prefer interaction may appear somewhat odd or socially inept in comparison to same age peers. For instance, if they have speech, they may dominate conversations on a single topic of personal interest, or they may interject comments unrelated to the topic at hand (Simpson & Zoints, 2000). They may repeat nonsensical sounds or phrases over and over again (echolalia). They may inappropriately use gestures and expressions, and they tend to misinterpret them in others, if they notice them. Not surprisingly, individuals with ASD often find it difficult to maintain meaningful relationships, and those afflicted with the most severe form may seem out of touch or unaware of the presence of others (Simpson & Zoints, 2000).

Individuals with ASD may have sensory sensitivities. They may, for instance, repeatedly sniff things and people, including themselves. They may flap their hands as a form of self-stimulation (Simpson & Zoints, 2000) or to communicate their wants and needs (National Institute of Child Health & Human Development, 2001). Other nonfunctional, repetitive mannerisms may include movements like rocking their bodies or rubbing their hands. They may twirl things or line them up, or they may insist on sameness and routine. Some may "eat or drink only from one particular dish or cup," whereas others may "become agitated if a road detour forces their school bus to take a different route" (Simpson & Zoints, 2000, p. 8). They may also display certain skills, such as working with puzzles or electrical appliances, or demonstrate abilities like recalling dates, zip codes, or map routes. Occasionally, those skills are exemplary, such as with individuals who have savant abilities (Aarons & Gittens, 1999).

Parental Involvement in the Educational Process

Approximately one in five children with ASD appears to "develop normally for several months or even years, after which time they may display self-stimulatory behavior and lose previously acquired skills such as speech, social interest, play abilities, and bowel or bladder control" (Simpson & Zoints, 2000, p. 11). Parents are often the first to recognize that something is amiss with their child. Although onset of ASD symptoms is by age 3, many parents develop a sense that something isn't quite right long before then, perhaps as early as infancy (National Institute of Child Health & Human Development, 2001). It is not unusual for parents to take their child from doctor to doctor very early in the child's development, persisting even in instances where doctors initially dismiss their concerns and fail to recognize telltale signs of ASD (Gray, 1998). Ultimately, it is the parents of children with ASD who are "searchers in quest of cures, or at least effective treatments. They are advocates, fighting for the services and supports they believe will give their children a better chance for a good life. They are therapists and therapy coordinators" (Cohen, 1998, p. 65). They are the organizers of support groups and information agencies, and the promoters who push for public policy and ongoing research.

The right of parents to pursue a free and appropriate education for their child with a disability is protected by federal law. This includes meaningful participation of parents in the educational planning for a child with an autism spectrum disorder. The Committee on Educational Interventions for Children with Autism, formed by the U.S. Department of Education's Office of Special Education Programs, "recommends that educational services begin as soon as a child is suspected of having an autism spectrum disorder" (National Research Council, 2001, p. 6).

As the primary caretakers, parents possess invaluable first-hand insight into the unique behaviors and learning characteristics of their own child (Dunlap & Fox, 1999). They have the potential of providing vital information for planning effective educational and support services, particularly given that no two autistic children are the same and no single method is effective in helping every child with ASD (Dunlap & Bunton-Pierce, 1999).

A Fresh Perspective

Problematic behaviors of children with ASD are not likely to be limited to any one setting or circumstance, due to the pervasive nature of these disorders. In all probability, behaviors that educators find difficult to manage in the school setting are ones that parents have had to contend with at home or in public as well. Not only do parents often have intimate knowledge of their child's problem behaviors, but also they may have developed effective ways of managing them. "Often, the family's routine is predetermined to cope with behavioral problems or to minimize their occurrence" (Gray, 1998, p. 4). Educators potentially have much to gain by tapping into that insight, and parental solutions may have applicability in the educational setting, with or without adaptations. Unfortunately, the common information-gathering practices of checklists and pre-written formal questionnaires that are used by educators do not invite nor facilitate a level of interaction that would encourage such open disclosure. Two case examples show how parental insight can be very useful to educators:

"LaMonte," age 14, is asked by his mother, "Linda," what he wants to eat for breakfast. "Waffles! Waffles! Waffles!" he quickly responds, flapping his arms in undeniable excitement. Eating is his favorite pastime, and Linda smiles at her son's enthusiasm. She pauses to observe LaMonte heading toward the cereal cabinet rather than the freezer where the waffles are stored. Linda recognizes that her son has a very limited vocabulary, and although he clearly vocalized the word "waffles," she knows that is the only word he can say. His actions inform her that he has something different in mind for this meal. Linda sets out a bowl and spoon, then she heads to the refrigerator for milk.

LaMonte's communication issues are not specific to the environment. A teacher may ask LaMonte a question and then act on his verbal response, only to witness him dissolve into tears moments later as he claws at his eyes and kicks over his chair "for no apparent reason." It may take several of these seemingly unpredictable outbursts, and much frustration for the teacher, LaMonte, and a classroom of his peers, to realize that LaMonte's behavior stems from impaired communication skills. LaMonte appears to have an ability to vocalize a response. However, based on Linda's insight, this teacher would confirm LaMonte's oral response before acting. This may be accomplished by having him point to a picture as he responds to a question or by observing his body language for additional clues or to affirm his response.

"Stacy's" son is a constant "chatterbox" who can talk the ear off just about anyone -- as long as the topic is of his choosing. His momentary "love" is of Pokemon characters. He can recite much of the dialogue of the original movie, and he excitedly talks about the various features of one character and its next evolved image, as well as about which characters are more appropriate for different aspects of playing the Pokemon game. "He'll talk your leg off if you let him, and he seems quite knowledgeable, quite capable," his mother describes. Yet, he's never played the game.

Stacy recognizes that her son is deceptively "sharp" based on exceptional memory for certain information. He picks up these "insider's secrets" from the statistics cited on the front of his Pokemon cards. This gives the impression that he's far more capable and interpretive than he really is. Hand him a book to read, and he'll steadfastly refuse. "It amounts to words on paper, and he quickly loses interest," Stacy relates. "His retention plummets, and he'll start acting up because he's confused." Stacy has discovered that if the same book is read to him instead, it not only holds his attention, but he seems to comprehend at a much higher level. He's still markedly behind his same-age peers, but it improves his understanding and he's less likely to misbehave.

A teacher, who is aware of these limitations and the facade impression that he is more capable than he really is, might compensate by having his assignments orally read to him when possible. Also, the teacher could modify reading assignments by breaking the passages into more manageable reading chunks.

This research examines problematic behaviors of the children with ASD in this study, as identified by their mothers, and it examines how parents have learned to respond to them. It also examines how these behaviors may manifest themselves in the classroom setting, given that ASD are not specific to one environment. Applicability of parental solutions in the school setting is also discussed.

Method

Participants

Eleven mothers of children with ASD were interviewed as participants in a prior study (Grosch & McKellar, 2002) that examined the degree of alignment between parents' educational goals for their children and the school objectives that appeared on their children's individualized education plans. Transcripts of those interviews were reexamined for this study.

Participants were identified through contacting agencies, schools, parent support groups, and individuals in six counties in a midwestern state. These participants voiced an interest in learning more about their child's disability, and they expressed a desire to help others understand parents' perspectives on the lives and school experiences of children with autism. (In all reports, the names of the parents and their children have been changed to protect their identities.)

During interviews with two of the mothers, the child's father was also present. In both instances, the father specifically asked to be present in order to improve his understanding of the disorder affecting their child. The researcher focused on the mothers' responses for consistency in methodology. Also, one participant had two children with autism, as well as a third, normally developing child. For the purpose of the study, her responses were given in relation to only one child.

The children about whom the mothers spoke ranged in age from 4.3 years to 17.0 years at the time of the interviews, with a median age of 7.2 years. All children resided at home with both parents. There were three girls and eight boys, and all were Caucasian. Data on family income were not collected. However, based on parental comments about their vocations and those of their spouses, as well as the interviewer's impression of their homes, given that the majority of the interviews were conducted in the home, the socioeconomic levels of the families ranged from lower middle to upper middle class.

Nearly half of the children whose parents participated in the study were diagnosed with autism (n=5). Other diagnoses included Asperger's Disorder (n=2), Pervasive Development Disorder-Not Otherwise Specified (n=2), and aphasic with autistic tendencies (n=1). One other child was diagnosed with global developmental delays, pervasive developmental disorder, or autism, depending on the diagnostician's background (neurology or developmental pediatrics). Four also were being treated for concurrent seizure disorders.

Procedure

Mothers participated in two interviews of at least one hour each, typically in the home (n=7). One interview was by telephone while the mother was at home, and the remainder (n=3) occurred in a restaurant of the participant's choice. Ethnographic interviewing techniques were used to elicit descriptions of the child's functioning in daily life at home, in the community, and within the school setting. Through a series of open-ended questions, participants were encouraged to discuss their experiences with their child, and all interviews were audio taped and transcribed verbatim.

During the first interview, each mother discussed her child's routine on a typical day, as well as the child's strengths and challenges, any diagnoses, and ongoing treatment. During the second interview, the mother discussed her child's school experiences. Participants were encouraged to talk about academic performance, program modifications, strengths and concerns about their children's education plan, and their goals for their children over the course of the next year. Finally, they were encouraged to describe what they envisioned for their children's future.

For the purpose of this study, the original transcripts were reexamined from the viewpoint of behavioral issues among children with ASD. Two researchers separately examined each transcript for problematic behaviors voiced by the mothers and then compared their findings. The researchers also attempted to identify any solutions parents expressed for addressing these behaviors, although not all participants identified solutions for every problem they discussed. Participants were not

specifically asked about behavioral problems or solutions, given the original focus of the interviews and the nature of the ethnographic interviewing method. In certain instances, a problem was not directly stated but rather implied, yet the behavior would clearly be a problem if allowed to escalate without interventions in a classroom setting.

Once problematic behaviors and solutions were compiled for each family, the researchers grouped these into categories for each child. Then categories were grouped into themes. The researchers attained consensus for each step of this process.

Results

Breadth of Problematic Behaviors

In all, there were 29 different categories within which all problematic behaviors were placed among the 11 families. The number of children whose behaviors were included in any given category ranged from 1 to 11, without respect to the quantity of cited behaviors from each family.

Striking of these results, given that participants were not directly asked about problem behaviors, is the sheer number of categories for which any mother identified behaviors problematic to her child. The least number of behavioral categories for any one family was 17 (n=1), whereas the most was 24 (n=2). The median was 20 out of the 29 categories.

These statistics suggest the pervasive impact of autism. The fact that so many mothers voluntarily raised such a varied and extensive set of behavioral issues is suggestive of multiple sources of stress on the family that includes a child with autism. It also has clear implications in the school setting for educators who teach these children.

Given the pervasive impact of ASD on a child's functioning, it is reasonable to assume that problematic behaviors in the home will likewise surface in some fashion in the educational setting also. These statistics allude to the breadth of issues that an educator potentially will face when instructing a student with an autism spectrum disorder. They also emphasize the need for the educator to be knowledgeable about triggers, resolution skills, and coping strategies for dealing with issues far beyond the recognized key features of ASD.

Themes and Categories of Problematic Behaviors

Mothers in this study reported numerous problematic behaviors in the home or community that relate to manifestations of ASD. Other categories were placed into five general themes: frustration and disharmony; attentional issues or otherwise interfering with the learning process; medical/personal care or concurrent conditions; behaviors/attitudes that are socially stigmatizing or otherwise unusual; "other." (See Table 1.)

Table 1 :
Problematic Behavior **Reporting Parents**

Behaviors associated with ASD:

Poor social interaction and play	11
Limited communication skills or problem language	11
Rigid/insists on sameness	11
Sensory sensitivities	10
Repetitive behaviors	6
Poor eye contact	6
Difficulties with transitions	4

Behaviors not associated with ASD

Frustration and disharmony

Acting out behaviors	11
Refusal or noncompliance	10
Too much/too little fear, specific fears and worries	9
Acts unhappy or depressed	6
Engages in self-injurious behavior	5

Attentional issues, otherwise interfering with the learning process

Spaced out, non-focused, off task, distracted	10
Won't sit still	9
Poor school performance or learning difficulties	9
Difficulty waiting	7
Poor task follow-through or slow pace	6
Easily bored or won't initiate appropriate activities	4

Medical/personal care or concurrent conditions

Poor hygiene habits, toileting problems, inadequate self care	11
Problems with sleep, nocturnal enuresis (bed wetting)	10
Difficulty with fine or gross motor skills	10
Problems with med. selection, dose regulation level, side effects	5
Concurrent medical conditions that cause problems	5
Concurrent diagnosis of a seizure disorder	4

Behaviors/attitudes that are socially stigmatizing or otherwise unusual

Unusual behaviors	11
Obsessive/compulsive behaviors or perfectionism	9
Odd food preferences (limited diet)	9
Egocentrism	2

Other

Issues that do not readily fit in other categories, such as being unable to calm down once too excited; having a hard time getting going in the morning; or having (unspecified) difficulties around crowds	3
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Table 2 :

Problematic Behavior

Example manifestation

Sample Solutions (Range 1-11)

Behaviors associated with ASD:

Poor social interaction and play

Has poor social skills in general.

Social skills training at school, para assigned; sister taught to be a "peer model student"; sister's friends are taught to directly invite him to participate in games; Mom transitions him out to join the other children; playground equipment added to yard to attract children.

Limited communication skills or problem language

Cannot tell others when he's sick. Says his neck hurts, when it's actually his throat.

Mother recognizes his language difficulties and confirms his intent through other means.

Rigid/insists on sameness

Becomes upset and disrupts others when there are changes to his routine (kicking, screaming, hitting, crying, etc.)

Is rewarded if he can remove himself from the setting as he becomes upset without disturbing others; takes himself to a preselected quiet location; Mom holds him for soothing; teach others about Asperger's behaviors so they better understand what is happening.

Sensory sensitivities

Covers his ears, hits, misbehaves, becomes aggressive during P.E.

Recognize he's overwhelmed by noise, lights, activity, competitive setting. Pull him out with 1-2 other children for smaller group participation; receives adaptive P.E.; para assists in P.E.; receives ongoing instruction in good sportsmanship.

Repetitive behaviors

Repeatedly flushes toilet to watch water swirl. This is a routine just prior to swimming lessons.

Instructor recognizes this is one of his "quirks" and allows him to do his "routine" without making a big deal out of it before joining her for the lesson.

Poor eye contact

Does not remain focused nor attentive with good eye contact at times.

Mom notes poor eye contact is a signal that he doesn't understand; she breaks down a task into more manageable parts. Also, Mom frequently prompts him to make eye contact so she knows she has his attention by saying, "Look at me, look at me."

Frustration and disharmony

Acting out behaviors

Acts up in restaurants, public events

Recognize he is sensitive to noise, change in routine. Avoid noise, chaotic setting if possible; identify location and relaxing things he can do "alone" there to settle down; pull him aside and away from activities periodically; get a sitter and leave him at home.

Becomes upset and yells at teacher when he loses a game in P.E.

Recognize he's unable to put himself in others' shoes (TOM). Assign a para to monitor his emotions and play intensity; give him choices for participating; use daily incentive chart in P.E.; educate teacher about Asperger's and his sensitivities to noise, whistles, competition.

Table 2 : (cont

Problematic Behavior

Example manifestation

Sample Solutions (Range 1-11)

Behaviors associated with ASD:

Refusal or noncompliance

During shopping, he won't settle down, "flips out": cries, pinches, wants to climb into cart, blinks eyes, yells, hits, looks downward. Refuses to cooperate (very reactive to unexpected change such as a quick errand to the store)

Recognize that he's sensitive to fluorescent lighting, noise, lots of activity. Avoid stores with lots of fluorescent lights; cover fluorescent lights at home; shop when it's less crowded, avoiding noisier display aisles; take him home for a relaxing bath and bed. Maintain a rigid schedule where possible; use a visual schedule; review the schedule with him frequently; prewarn of a schedule change; use this child's fascination with numbers to an advantage by pointing out the minutes during preparation to leave; start counting aloud with passengers in the car if he becomes upset; point out the numbers on the bank marquee (time and temperature), on houses (addresses), on shelves in stores (prices).

Attentional issues, otherwise interfering with the learning process

Poor task follow-through or slow pace

Attentional issues, otherwise interfering with the learning process

Parcel work with breaks to do more desirable things; use timer to limit, focus time; provide para to help keep on task; frequently praise appropriate behavior; modify assignments to his interest. Engage him in helping prepare the food (opening and pouring ingredients), setting the table, summoning family members; hold hands around the table for prayer to keep his hands busy; have him say "amen" as a participant in the pre-eating prayer routine.

Difficulty waiting

Does not display independent work abilities
Insists on eating "right now" (in restaurant or at home)

Medical/personal care, concurrent conditions

Has seizures

Turns around in her seat and doesn't pay attention (likely side effect of medications)

Modify assignments and make them personally meaningful to help maintain interest; provide para for note taking because she only has a 2-minute attention span; offer choices; frequent reinforcement that is personally meaningful to her.

Poor hygiene habits, toileting problems, in-adequate personal care

Waits too long to go to the bathroom and has accidents

Maintain a change of clothes at school; set alarm at night for bathroom breaks; have him wear pull-up underwear; remind him to take a bathroom break; have him shower in the morning before school.

Table 2 : (cont.)

Problematic Behavior **Example manifestation** **Sample Solutions (Range 1-11)**

Behaviors/attitudes that are socially stigmatizing or otherwise unusual

Unusual behaviors

Jumps up and down, flapping hands and "shivering" when excited, happy

Mom finds the positive in it (he's "fun," "in the moment," has "an infectious laugh"); provide social skills training; educate others about autism tendencies; give opportunities to be around normal peers and provide para to help point out what's normal and what's not.

Flaps hands, jumps, screams, claws at his eyes and becomes upset over accidental happenings.

Take him to his room to calm down on his own; do NOT try to talk to him in the heat of the moment; later, try to distract him with light-hearted banter.

Obsessive/compulsive behaviors or perfectionism

"Falls apart" when he makes mistakes in art class: screams; rips up paper; insists on getting a new sheet; pleads for eraser; becomes physical when hauled to time out because he's creating a scene and losing control..

Provide him with "fixable" working materials such as colored pencils and an eraser; provide extra paper; prepare him for projects by pointing out that it's "no big deal" if he makes a mistake; reward him for de-escalating himself in the class or removing himself from others to settle down without making a scene or disturbing peers; transition him back to the classroom over time if he loses control; do not touch him if at all possible because he's sensitive to touch.

Other

Unable to calm self

Cannot control herself if she gets too excited

Give her a quiet activity when she starts getting excited, such as a book or puzzle; let her listen to music in her room, away from others; let her swing (or swim if an option) to calm down.

Parent Experiences, Solutions

Mothers often demonstrated perseverance and creativity in addressing their children's behavioral problems. Table 2 contains a problem and sample solution for many of the 29 categories, as suggested by parents in this study.

There are situations present in all schools that are likely to be difficult for children with the kinds of problems these mothers described. The three discussed here are related to mealtime, playing games, and sensory sensitivities:

Mealtime

Nine of 11 mothers reported behavior issues involved with meals. These included the foods children were willing to eat (which often seemed to change without rhyme or reason), sensory issues involved in chewing and swallowing different textures and tastes, elaborate eating rituals which included sniffing the food and serving containers, and being bothered by noise, lighting, and activity in the environment. The latter was particularly the case in a restaurant setting where there is often a continual background hum of patron chatter. Couple that with the extended "wait time" as food is prepared, and it simply wasn't worth the hassle, mothers reported. In fact, many said they long ago gave up on taking the family out to eat. "You have to pick your battles," said the mother of a second grade boy with Asperger's.

These things considered, it is understandable that many participants expressed sentiments of dread associated with household meals. "There are times when I wish he had a feeding tube so we could just dump food in," said the mother of a 6-year-old kindergartner with autism. Typically, food had to be crunchy, salty or otherwise spicy, and neither hot nor cold. Another mother reported having to lock her refrigerator to keep her son from eating the entire jar of olives, juice and all, in one sitting. Meats and stringy foods seemed to be especially aversive, and mothers often relied on cereals and bread products (plus nutritional supplements) as the staple foods. This is despite their best efforts to offer various types of other foods. Insistence that the child eat what is served would typically result in tantrums (hours long in some circumstances) and gagging reactions, with the child preferring to go without meals than to eat. Tactile sensory issues were very common, and often, occupational therapy was a part of the treatment process to encourage the children to be receptive to various textures and tastes in their mouths. Attempts to make the child eat by using punishment were typically unsuccessful.

The school lunchroom is fraught with behavioral issues for children with ASD, because it combines these issues involving meals with the fact that most of the children the participants discussed were extremely sensitive to noise (and for some, fluorescent lighting). The lunchroom is also an environment in which social interaction is highly spontaneous and unstructured. Very commonly, these children will not eat, but they do engage in odd behaviors or echolalic

speech, or they get up from the table and wander about. All of these behaviors tend to lead to disciplinary action by school staff. In short, this daily act of nutritional sustenance is a setup for problematic behaviors, in school as well as at home.

Mothers expressed a number of solutions to behavioral problems associated with eating. For children with tactile sensory issues, mothers suggested allowing children to bring their lunches to school, even in instances where participation in the hot lunch program was mandatory. It is important in instances where tactile issues are so extreme that school staff and parents maintain open communication. One boy actually went without lunch for most of a school year because the school did not take into account his extreme mealtime issues, instead requiring that he eat what was served like the rest of his peers. Also, an alternative, quieter setting is appropriate for these children, some suggested. This allows the child an opportunity to calm down from the pressures of social interaction and classroom stimuli during this midpoint in the day. One participant suggested that a para professional be assigned to sit with her son as he eats his lunch to help him participate in conversations with others and to interact more appropriately with them.

Recreational activities

All mothers in this study cited problems relating to social interaction, such as friendly competition, game playing or organized sports. Reports of withdrawal, overreacting, or emotional outbursts were quite common, and mothers often reported that their children neither participated well, nor wanted to engage in, these activities. The wait time during instruction or before taking a turn, the transitions as teams switch sides, the giddy shrieks and whistles, and the physical "tag and you're out!" were often too much. These children have difficulty understanding their own physical placement in relation to others in continual, spontaneous team interaction. Mothers noted that their children unwittingly interrupt an activity as they attempt to join in, misunderstanding the rules of a game and their role as participant. Frequently, mothers reported their children also took winning and losing too seriously, and that they failed to understand that when the team loses, it involves everybody losing, not just them.

It was a rare exception that a child with ASD was invited to a classmate's birthday party, based on comments made by participants. Those who accepted invitations were typically brought late and picked up early, mothers reported, with the host duly forewarned about potential outbursts. Mothers reported the need to prepare the child beforehand about what to expect at the party, including a review of the most basic of social interactions, such as what to say as an appropriate greeting upon arrival at the party. The mother of a 9-year-old with PDD-NOS, related an experience at a birthday party during which she was in attendance:

"He'll sit there and he'll eat his food and he'll watch them open presents, but he's not... engaging in conversation with anybody or playing games. I went with him one time and they were playing football. He grabbed the ball and wanted everybody to chase him. He didn't understand the point of there (being) two teams, and it's one team against the other... He was like, 'Chase me!' He wanted both teams to chase him."

In a school setting, this type of behavior may be encountered every day during recess, organized sports, classroom games or celebrations, and particularly during PE. Gymnasiums are brimming with shrill laughter and screams, blowing whistles, and instructions that are yelled above all the noise. Additionally, much of the activity centers on spontaneous interaction, with children scattering all over the gym in a seemingly nonsensical fashion. It amounts to an assault to the senses of a child who is reactive to so much activity. And finally, there are "winners and losers" inherent to competition, which only compounds matters for these children who fail to grasp that when they lose, everyone else on the team loses also. In short, it's a cavernous sounding environment that is fraught with opportunities for failure, without careful preplanning and attentive assistance to ensure that the child with ASD succeeds. Like other participants in this study, the mother of a 6-year-old said that conflicts in these areas are chronic for her son, particularly in P.E. After all, it's the "most social time" of the school day, she surmised. She went on to explain her son's struggles in this way:

"He's got the skills for P.E. but there is a lot more that goes into P.E. than just the physical gross motor skills. You go in those gyms, and it's full of echoes. It's kind of this loud, cavernous place, and you've got people running around and there aren't a lot of rules and order there. You really are dealing with a lot more than just whether you have physical skills to catch a ball or whatever."

Mothers had many suggestions to address issues relating to these areas. Continual, ongoing, extensive social skills training was frequently cited, as was the assignment of a para professional to assist by pulling the child aside and explaining the rules and enabling the child to practice the skill in a more individualized fashion. Social stories and social scripts also were frequently mentioned, as was the suggestion to offer alternative activities that are not as fraught with stimuli and not as problematic. Giving the child the option of sitting out and observing was suggested. And a mother noted that in one school, a few students are pulled out of the regular PE activity and offered special incentives to engage in a modified form of the game with her child. This effort makes the activity more manageable for the child and would be attempted in a smaller area in the corner of the gym, if not an altogether different location. It also sets the stage for a more positive experience for peers who otherwise may find the child's odd behaviors obnoxious and intolerable.

Sensory Sensitivity

Nearly every participant of this study cited example after example of sensory issues of their autistic child. These typically manifest themselves in seemingly unpredictable outbursts, odd or acting out behaviors, poor task follow-through, distractibility, or flat out refusal or noncompliance. It is important to note that to some mothers, these behaviors appeared to be the result of a cumulative effect of exposure to environmental factors that are offensive to their children's senses, and these factors impact the child in various ways in everyday life, regardless of the setting.

Many mothers stated their child was extremely sensitive to touch. It was not unusual for a participant to describe a child as withdrawing, screaming, crying, beginning echolalic speech, or actively striking out at the source of this touch by kicking, hitting, or pinching. Other mothers described their children as flapping their arms or running back and forth with no particular destination. Excessive noise or lighting, particularly the subtle flicker of fluorescent lighting (that may not be apparent to anyone else) or television screens, can result in the same outbursts, and these children may cover their ears as though sound were painful.

One mother shared that the dentist completely sedates her son for basic dental care, which necessitates him staying overnight at the hospital. Another mother shared about a "nightmare" trip to the barbershop just before her son was diagnosed with autism:

"It was a very busy place on South Main. Very busy, with lots of chairs, lots of noise, hair dryers, and just lots of confusion. When it was his turn to go to the chair... when (the barber) was going to cut his hair, he just wouldn't let her touch his hair. He kept screaming, 'No! No! No!' and he kept pushing her hand away. It was pretty embarrassing to me at the time. He just threw a fit, and I couldn't get him out of the chair. When he finally climbed down off the chair, I had to drag him out of there, kicking and protesting. I got out to the car, and I was pregnant, and I started crying. It was very emotional for me."

Several mothers had similar stories to tell about "casual" stops at local stores. Simply getting these children inside the store can be a major undertaking. One mother described how she had to pry her son's feet and hands off the corners of the van door as she attempted to remove him from the vehicle to go inside a Wal-Mart. Once inside the store, many participants described their children as dropping to the floor, kicking and screaming, pulling on their mother's arm and pleading to leave, or running all over the store, out of control as they cover their ears and perhaps cry or make odd sounds.

Mothers noted they learn to place their child in the shopping cart if possible, to keep moving, to avoid close proximity with other shoppers (because their child may reach out and grab a stranger), and to complete their shopping as quickly as possible. They also have learned to avoid aisles where there are noisy

displays. Some autistic children apparently feel compelled to touch everything they encounter. Mothers described teaching their children to keep their hands in their pockets at all times while in a store -- or better yet, in their mother's pocket. This enables the mother to keep closer tabs on her child, which is a huge issue for parents of children who are prone to impulsively bolt out of the store. These children often are oblivious to dangers around them such as oncoming cars in the parking lot. A child's tendency to flee suddenly can have tragic consequences.

Discussion

Parents shared many personal stories about issues relating to homework struggles and discipline. Both are sources of a tremendous amount of stress within the family of a child with ASD, they note. This stress is on top of already existing concerns parents carry with them regarding what the future holds for their children, and it has implications to the family in years to come. They also spoke about adjusting to having a child who is reluctant to receive affection.

Limitations

It is important first to acknowledge several factors that may have influenced the amount and scope of behavioral problems and solutions cited in this study. First and most apparent is the fact that the focus of the interviews with the study participants was on an unrelated topic. It is possible that if specifically asked about problematic behaviors, the participants may have responded in a different fashion, although that likely would result in an increase in reported behaviors and categories rather than any decrease in them.

Second, all participants in this study were married, and the children lived in two-parent homes. Having two parents in the home may have reduced the stress and physical demands on the mother from raising a special needs child. It may also have resulted in an underreporting of problematic behaviors, since the availability of two adults to respond to the exceptional needs of a child with ASD would likely have increased the efforts made to manage the child's behavior effectively.

Third, a number of parents in this study had professional training in the educational or mental health fields. Theoretically, autistic children would fare better in a home in which the parents are more educated about exceptionalities or instruction in general and who are potentially more aware of available resources to assist them with raising a child with ASD.

Fourth, responses in this research were all from mothers. Fathers may have had different responses if asked the same questions. And finally, participants of this study were of the same race and relative socioeconomic status. Persons from other

cultural/racial groups may arrive at different solutions to the reported problems. And it is quite likely that participants with less capable family (or extended family) support and fewer economic resources at their disposal for seeking assistance with child rearing issues would have different, or a larger quantity of, behavioral issues to report.

Homework

Homework sparks considerable discord among families of children with ASD. One couple's comments were similar to sentiments expressed by other participants in this study: The mother of a 12-year-old daughter with Asperger's explained that assignments invariably included several inferential questions, which she felt were beyond her daughter's comprehension. She noted that someone from the Kansas Department of Education had recently toured the school and looked at their daughter's textbooks and educational materials. They echoed the parents' concerns, and reportedly were assisting school staff in modifying instructional materials to meet her needs better.

The homework topic struck a particularly raw nerve for this child's father, who was primarily quiet during the interview until his wife raised the subject. He spoke at length about hours-long nightly battles with trying to keep their daughter focused and on task, and he described it as mostly a losing battle. Often, correct homework completion required the daughter's accurate interpretation of class discussions from earlier in the day, in addition to adequate notes. Like many children in this study, the writing process was very laborious for this couple's daughter, and she often missed important information because of this limitation, in addition to her poor language comprehension. One school consequence for not completing assignments involved time served in after-school detention, known there as "crunch time." This couple's daughter misunderstood the purpose of crunch time, assuming it meant she would be given the candy bar by this same name if she stayed after school.

This child also has a severe seizure disorder that went undetected for many years. At the time of the interview, adequate measures were not in place to ensure that she consistently received her midday dose of medication. This only confounded matters. "We've been told she only has a two-minute attention span at most," her mother stated. She doesn't get her work done at school, so she brings it home to complete. We try to support the school, said the mother, but "where do you draw the line? Sometimes it may take several hours for her to do what other kids would take only a half hour to do." The father concurred.

Without modifying assignments to capture and hold her interest, their daughter quickly becomes discouraged and overwhelmed, the father added. With math assignments, for instance, "they're

just numbers on a page of paper, not a right or wrong problem." It's the same way with reading: "She just reads words without (putting) meaning to the words." One bright spot for these parents was their realization that if the same stories were read to their daughter, rather than having her read to herself, she was more interested and attentive for longer periods of time. "If we read a book to her, she'll get 100 percent... We're looking into talking books," said her father.

Very strongly expressed by most participants in this study was the sentiment that they already are juggling a heavy load by parenting a child with an autism spectrum disorder. The additional responsibility of overseeing their child's homework can be overwhelming, which should come as no surprise, given that mothers reported that problematic behaviors were considerable both in number and in breadth of categories. Participants expressed a sense of frustration as well as exhaustion. They're always "on duty," 24 hours a day, since nearly all children in this study had nightly sleep issues. Sometimes, the last thing on their minds is how to get their child to understand homework, much less complete it.

Worry

From the time they first suspected their child had an exceptionality, which often came years before the formal diagnosis, parents in this study said they worried about their child with autism. At a time when most parents are pondering over T-ball or soccer placements, those who participated in this study said they were concerned about what will happen to their children when they grow up. Worry is almost a chronic state for many reasons. The mother of the oldest child in this study, a 17-year-old boy who is aphasic with autistic tendencies, said that she was searching for options for her son's care as an adult with multiple needs. At the time of the interview, her search had turned up very little. Any hope for semi-independence hinges on funding and available services, she said, and it's just not there. She reasoned that her son had the same needs at age 17 that he will have at age 20, or even age 25, yet, once he reaches adulthood, the funding stops. This mother also expressed worry about who would take responsibility for his care when she and her husband have died. Other study participants expressed similar concerns.

The mother of two sons with autism said she and her husband are already making plans for buying additional land and constructing a small house for the boys after they grow up. The older of the two children, age 5 1/2, was about to enter kindergarten when his mother was interviewed. The mother of another boy, a first grader with Asperger's, said she hopes that her son's apparent gift in music will help him find his niche in the family's small community. Another parent worries about whether her daughter will even make it to adulthood. She described her

daughter's "dream job" as working at McDonald's someday. However, it's possible she won't live that long. The mother explained that her daughter has a severe seizure disorder, and that the 11-year-old was hospitalized a few weeks prior to the interview with life-threatening seizures her mother attributed to increased stress at school. She's particularly sensitive to her environment, the mother said, and yet "they just keep packing (the kids) in" her class.

Discipline

Typically, the public misinterprets odd behaviors displayed by children with ASD, largely because their disabilities do not affect their physical appearance. Very often, these behaviors are interpreted to be the result of inadequate discipline in the home. This is particularly the case with higher functioning children who have Asperger's or PDD-NOS. This sentiment can divide friends, extended families, and even spouses who are at different stages of understanding the child's exceptionality and accepting it.

Virtually all parents in this study said they discipline their autistic child. "That's the only way they can learn that it's not the way to behave," one mother said. "But it takes a lot of time, and they don't pick up these things easily. Sometimes, it seems they never do." That doesn't make the disapproving looks any more tolerable, though, as another mother described:

"I want to crawl under something and die. She just looks like such a cute little girl, just sitting there in the cart, and he's thinking, 'What a brat!' I mean, she looks so normal; she doesn't wear her disability on her face or anything. And yet she has no clue whatsoever that she's doing something she's not supposed to be doing. And there are other people watching all this and thinking, 'That spoiled kid!'... (If she had) Down's Syndrome, where the disability was obvious, they wouldn't dream of chocking it up to behavior. They'd think nothing of it, really. But with autism, it's not so obvious. She looks perfectly normal. Sometimes I just want to put a shirt on her that says, 'I'm autistic!'"

Before learning of their child's exceptionality, participants typically said they relied on more traditional discipline measures. For several, that included spankings. Some mothers conveyed feelings of guilt and regret over spanking their children for behaviors they later realized were manifestations of their disability. Other mothers noted they continue to use this method, after discerning between intentional misbehavior and a possible manifestation of their children's disabilities. Finding discipline measures appropriate and comfortable for each participant took time, and sometimes they consulted with developmental specialists for behavior modification ideas.

Frequently, mothers spoke of using brief time-out methods for discipline. Sometimes, that included literally holding the child onto a time-out chair for the duration. Mothers tended to identify preventative measures as more helpful for maintaining better

behavior in their autistic child. Most often, mothers provide them with frequent breaks away from everyone else with an assortment of preferred, relaxing activities such as books, puzzles, videos, and music.

For even the most consistent and discipline-skilled parent, problematic behaviors in public were sometimes inevitable. Several participants disclosed that they frequently gave up activities and get-togethers with friends and relatives since having an autistic child. That included church services, eating in restaurants, attending parties, and going on vacations. One mother said that her son cried and fretted during the entire drive to an amusement park 200 miles away. All he wanted to do was to return home. The family eventually gave up and went home. It just wasn't worth the hassle, she explained. Holiday celebrations are the same way, amounting to a major disruption of the child's routine. The mother of a 6-year-old with autism described his behavior during his second birthday party, the year they began realizing something was wrong:

"He didn't want to open any of his presents, and we were like, Something's just not right. What 2-year-old doesn't want to open his presents? He just didn't want the attention. And we'd have these people and all these new toys, and he just preferred to be down the hall, alone in his room."

Affection

There are times when a simple hug from a child can make the most overwhelming circumstances somehow appear less daunting. That simple gesture often never comes with autism. Frequently, children with ASD stiffen or recoil from touch. One mother shared about her sense of loss, recalling that her daughter was perhaps 7 or 8 years old when she received her first hug. Other mothers described feelings of rejection and loss from failed attempts to express affection toward their children. This was also an issue for extended family members, mothers reported. Another mother said it's taken years, but she is finally able to cuddle occasionally with her daughter, an adolescent now at age 12. "I can do it now, but I know how to read her body language," she explained of this accomplishment. Another mother described her son as being rather affectionate at times. However, it took some getting used to his hugs, which she described as her son pressing the side of his face against her back for a few moments.

Most Behaviors Happen for a Reason

It may not be clear to the observer, but most behaviors happen for a reason, even for children with autism. Particularly with recurring behaviors, it may be necessary to "think outside the box," as one mother worded it, to put oneself in the shoes of the autistic student to identify those triggers. Children with autism typically misinterpret social interactions and emotion-filled motives that the rest of us take for granted.

It may be easy to chock up self-injurious behaviors as "typical" of autism and simply "something that autistic children do." The mother of the oldest child in this study commented that her son is pretty compliant, as long as he understands what is expected of him. When he's confused or when his school assignments were beyond his abilities, he would either repeatedly bite his hand, or he would stand up, then touch the floor, stand up, and then touch the floor again, in a repetitive fashion. Another mother said her daughter gets up and wanders about the room when she's confused, or she may start talking to the teacher and peers, oblivious to the fact that she's interrupting instruction to the rest of the class. Yet another mother described her child as repeatedly opening and slamming shut his desk lid. These mothers noted they eventually learned to "read" these behaviors as indicators that their children didn't understand their work and were confused.

Every autistic child is different from the next one, and there is no single educational plan or method that successfully reaches every autistic child. Mothers could not sufficiently underscore the importance of educators learning about their particular child's abilities, behaviors, triggers, and calming techniques. Truly, teaching a child with an autism spectrum disorder is more than simply knowing the three key features of autism. Educators would be wise to understand the individual child fully before placing the child in the teacher's classroom.

Implications

Teaching children with ASD clearly involves understanding and addressing problematic behaviors beyond those related to the primary features of autism. Time and time again, parents in this research spoke of issues relating to sensory sensitivities, acting out and noncompliance, mealtime difficulties, poor attention and lack of follow through, and inadequate personal care, such as toileting. The frequency and breadth of these topics were extensive despite the fact that mothers had not been asked to discuss problem behaviors.

Children with ASD have disabilities that severely impact all areas of their lives, as well as those of others espoused with their care, including educators in whose class they spend the bulk of their day.

Sensitivities, triggers, and responses that help de-escalate these behaviors are highly individualistic. The best chance of a child with an autism spectrum disorder making progress may very well hinge on strong cooperation between the home and the school. Educators can benefit immensely from knowledge about the unique aspects of a student with ASD through open communication with parents, especially prior to receiving the child in the classroom. Gathering information from parents may take an investment of time initially, on the part of both the teacher and parents. However, that investment has strong potential for preventing problematic behaviors from escalating in the long haul, and most importantly, it helps give the child a good chance of making improvement over time.

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The Role of the Child in Horror Films in Correlation with Current Perceptions of Youth in Today's Society

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Abstract

By conducting an in-depth study of horror films, I endeavored to determine the extent to which the depiction of children in horror films reflects society's view of children. The research consisted of viewing twenty-nine horror films released from the 1950's to present that employed characters ranging from the approximate ages of two to twelve. I then observed content, themes, and the roles of the children in the films. The research sought to discover if a correlation exists between the films' portrayals of children and sociological and psychological theories focusing on children. Accordingly, I examined the prevalent elements within the films emphasizing the vulnerability, impressionability, and the momentous potential of youth in accordance to each film's depiction of child development, family dynamics, and communication skills between children and adults.

Introduction

Fascinated by motion pictures, I view films from a variety of genres spanning the cinematic decades. In viewing different types of films, I observed that the horror and science fiction genres portray children in a manner that substantially deviates from most other genres. Though often featured in family films such as *Shane* and *Free Willy* as well as dramas like *Kramer vs. Kramer* and comedies like *Big Daddy*, the child in most genres often represents a one-dimensional "good kid" who functions as a simple plot device. In contrast, the horror genre presents markedly diverse types of youths involved in complex narratives, with roles ranging from Christ-figures to demons. Thus, in general, the horror film seemingly depicts children in a more comprehensive, and therefore democratic, perspective than the other types of films. Beginning with the 1931 film *Frankenstein*, in which the monster at first acts kindly towards a young girl but eventually kills her, horror has evolved from a genre that simply incorporates children in its films in order to substantiate the plot to a genre that presents children as the focus of its films. The horror genre arguably marks the only film genre to consistently incorporate children into the crux of the plot.

My research will show that horror films provide sociological and psychological insight into the child as influenced by his family environment. Accordingly, I hypothesize that the horror genre accurately portrays effects on the child caused by his unique family

structure—nuclear family, single-parent family, abusive family—as supported by the findings of established family behavioral studies. I also expect to find that the child-rearing practices presented in horror films draw upon and reflect firmly established family socialization theories, such as modeling, reinforcement, and parent-child contracts. Thus, the research aspires to determine that horror films incorporating children act as an examination of how the family forms the child psyche.

Methodology

My research entailed viewing twenty-nine horror films from the 1950's to the present, which introduced children from the approximate ages of two to twelve; the movie selection included *Night of the Hunter* (1955), *The Bad Seed* (1956), *The Innocents* (1961), *The Exorcist* (1973), *The Shining* (1980), *Poltergeist* (1982), *Firestarter* (1984), *Interview with the Vampire* (1994), *The Sixth Sense* (1999), and *The Others* (2001). I examined the dynamics of the children's families, the manner in which the parents and guardians treated and disciplined the children, and the manner in which the children reacted to their families and surrounding environment. In order to support my initial observations, I sought to find literature relating to society's perception of children. I then studied sociological and psychological publications that focus upon the influence of family dynamics on children, exploring nuclear, single-parent, and abusive families. I also researched specific family socialization theories developed by renowned psychologists, including Albert Bandura, who developed the concept of modeling; B.F Skinner, who established the reinforcement theory; and Sigmund Freud, who introduced the idea of identification and internalization. Additionally, I examined child-rearing studies that suggest which parenting skills produce healthy, well-rounded children and which parenting skills increase the likelihood of child delinquency.

Society's View of Children

The horror genre, as a whole, presents recurring themes promoting the value, strength, and limitless potential of children. Depictions of children as saviors (as seen through Lex's implementation of computer knowledge to save the adults in *Jurassic Park*) and possessors of extraordinary skills (demonstrated in Cole's ability to "see dead people" in *The Sixth Sense*) abound in horror films. The emphasis on children's empowerment and intelligence in these films appears to directly correlate with commonly-held perceptions about children: famed child-pediatrician Dr. Spock, who has provided texts on parenting guidelines since the 1950's, notes in his most current edition of *Dr. Spock's Baby and Child Care*, "The tendency is for American parents to consider the child at least as important as themselves—perhaps potentially more important" (39). The depiction of children as the central and most important characters

in horror films as exemplified in *Poltergeist*, in which Carol Anne's parents take extreme and selfless measures to rescue their abducted daughter from another dimension, reflects society's idealized view of children and its desire to place their needs and protection at the forefront of societal concerns. Additionally, the idea that "more of our children would grow up happier and more stable if they were acquiring a conviction, all through childhood, that the most important and most fulfilling thing that human beings can do is serve humanity in some fashion" (Spock 44) surfaces with the portrayal of child heroes, like Brad in *Critters*, who saves his family from invading space monsters, and Cody in *Bless the Child*, who acts as the Christ-like savior of the world. These prevalent themes also embody the intention of child studies to assess the "relation between the child's orientation to the adult world and the adult world's interest in fostering, enforcing, and moralizing upon its own interests and hopes in the child world" (O'Neill 77). Thus, a correlation appears to exist between society's view of children as observed by Dr. Spock and examined through child research and the representation of a significant group of children presented in horror films.

Family Structure

No one definitive family structure permeates the horror genre; rather, the genre presents many diverse family types. With "Divorce, single parenting, two parent working families, and blended families [becoming] the middle class norm, and the conception of children as growing and in need of adult nurture, protection and guidance [becoming] a fountainhead of parental anxiety and guilt" (Elkind, *Hurried* xvi), horror films appear to have adopted the many mutations of the family unit and, thus, lend themselves to an exploration of relationships between children's mental well-being and the structure of their families. Accordingly, the horror genre provides vivid comparisons between stable, nuclear families and unstable, nuclear families; the two-parent family and the single-parent family; and the nurturing family and the abusive family. By examining these varying family structures and roles with the aid of psychological and sociological research relating to the family, I found evidence to suggest that horror films fairly accurately portray the family and its potential effects on children within a particular family unit.

The Nuclear Family

In several of the selected horror films, the two-parent household offers many interesting insights into child development. First, the effect of the nuclear family varies depending upon whether a stable or unstable relationship exists between the parents. Research indicates that "Children in two-parent families whose parents were in conflict were much more likely to show behavioral and emotional problems than those whose parents had a harmonious

relationship" (Golombok 6). When comparing the different films that depict the nuclear family, I noticed that stable and unstable parent relationships surfaced: the loving and emotionally supportive parents in *Critters* seemingly help their son, Brad, to develop his selfless nature, which later enables him to heroically rescue his older sister from vicious aliens. Conversely, the violent conflict between the parents in *The Shining*—embodied in the scene in which the mother, Wendy, defends herself against the incensed father, Jack, with a baseball bat—appears to increase Danny's emotional breakdown, as suggested when he becomes unable to communicate verbally with his mother without the aid of his imaginary friend, Tony. However, a substantial number of the films act in direct opposition to the supposition that conflict between parents negatively affects their children. For instance, although surrounded by a loving two-parent family, Henry in *The Good Son* exhibits the characteristics of a severely emotionally disturbed child—he drowns his baby brother, shoots a dog with a nail gun, and attempts to push his mother off a cliff. Conversely, though Tad's mother in *Cujo* engages in an adulterous affair that threatens the family, Tad remains unaffected by the conflict. Thus, though a few of the films indicate that parent stability influences the behavior of children, no consistent pattern emerges to suggest that horror films reflect this ideology.

The Single-Parent Family

A number of the horror films explored depict the single-parent family, and the research found concerning the relationship between the child's well-being and his single-parent family varies as much as the films' portrayals of the households. The assertion that "Broken homes [...] have routinely contributed to more than their fair share of the delinquent population [because] in broken homes one is more likely to find unmet parental needs than would be the case in intact families" (Elkind, *Child* 173) provides one extreme view of the single-parent family, which *The Ugly* exemplifies through the character of Simon, who, continually neglected by his single, emotionally distraught mother, finally resorts to a life of violence and dementia, in which he claims that voices command him to kill people. Other sources suggest that "Most single-parent families result from marital breakdown, and children whose parents divorce are more likely to have psychological problems" (Golombok 5); by depicting the character of Cole wearing his father's old glasses, *The Sixth Sense* indicates that Cole's inability to relate to his classmates—his peers pick on him and lock him in a closet—stems from his inability to cope with his father's absence.

Concerning the sex of the single parent, studies propose that "the circumstances of single-mother families can be just as diverse as those of two-parent families, and it seems that it is the circumstances in which these families find themselves, rather than the absence of a parent that matter most for the child" (Golombok 13).

Thus, the nurturing mother figure present in *Aliens* who selflessly protects Newt against the Alien queen coexists with the overprotective and neurotic mother depicted in *The Others* who, the film gradually reveals, killed her children. Furthermore, a 1995 research study entitled “Models and Perspectives of Parent-Child Communication” produced “self report data indicat[ing] that members of single-father families reported greater levels of cohesion than did members of traditional families” (Dixon 109). In compliance with these findings, both films that introduced single fathers—*Firestarter* and *Pumpkinhead*—presented close-knit and loving relationship between father and child: Charlie’s father in *Firestarter* stresses to his daughter, “You’re all I’ve got in this world.” Consequently, the depictions of the single-parent families found in the films appear to reflect the varied findings associated with the one-parent family.

The Abusive Family

Of the twenty-nine horror films observed for this study, only *The Shining* and *The Ugly* presented the abusive family. However, both provide a markedly different view of the effect of abuse on children. The child sociology textbook *A Child’s World: Infancy Through Adolescence* maintains that abused children remain “more likely than are nonabused children to become aggressive themselves, delinquent or criminal in adulthood” (Papalia 330). Thus, *The Ugly*, which chronicles Simon from his endurance of his mother’s abuse as a child—“I bled from her beatings”—to his transformation into a psychotic serial killer as a young adult, exemplifies the negative consequences of child abuse to a shocking degree. However, despite the increased likelihood of violent and delinquent behavior, “Many abused and neglected children are resilient, apparently because of protective factors, which range from characteristics of the child to the presence of supportive people, to other life experiences” (Papalia 330). For example, in *The Shining*, young Danny’s “shining” ability, which emerged shortly after his father breaks his arm, protects him and acts as a defense mechanism that allows Danny to cope with the erratic behavior of his alcoholic father without becoming aggressive himself: as the film progresses, Danny’s imaginary friend Tony speaks for Danny and informs his mother that “Danny can’t wake up.” Though the child characters react to child abuse differently, because neither functions as a typical child, both support the conclusion that “When children are neglected or consistently ignored [...] their minds will fail to develop fully” (Spock 45).

Family Socialization Theories

Beyond the structure of the family, the manner in which the child learns behavior also plays an important role in their development. Several theories exist to explain how families socialize their children because, “With respect to children, [...] the

family is always more than just a haven or a prison, it is a school of human relations in which children learn how to live in a society” (Elkind, *Hurried* 142). Accordingly, the research examined the horror films in correlation to the most prominent theories, which include modeling, identification and internalization, operant conditioning, and parent-child contracts, in the hopes of finding evidence of these theories within the film’s subtext.

Modeling

In his book *Social Learning Theory*, psychologist Albert Bandura explores the role of modeling in learning and development. When applied to the children portrayed in horror films, the notion that “some complex behaviors can be produced only through the aid of modeling” (Bandura 12) offers a seemingly valid interpretation of why certain characters behave in a particular manner: “According to social learning theory, children’s imitation of models like parents is the most important element in how they learn a language, deal with aggression, develop a moral sense, and learn the behaviors their society holds as appropriate for their genders” (Papalia 35). The horror films examined appear to illustrate both positive and negative modeling. For instance, in *Phantasm*, Mike looks to his older brother and guardian as a positive role model, following in his footsteps both literally and figuratively; like his brother, Mike tries to warn and protect those whom the supernatural Tall Man threatens to kill. In contrast, Miles and Flora, the brother-and-sister pair portrayed in *The Innocents*, seemingly experienced negative influence from the prior caretakers of their estate; with his morbid fascination with death, sexually suggestive gestures, and expulsion from school because he proved “an injury to the others”, Miles, in particular, demonstrates that he models his behavior from the disreputable gardener Quint whom, due to the absence of a father-figure, the “poor little boy worshipped.”

Identification and Internalization

Developed by psychoanalyst Sigmund Freud, the concept of identification and internalization in which “the boy, for example, identifies with (sees himself like) the father and progressively internalizes the father’s values, beliefs, and prejudices [and] the girl identifies with the mother and progressively internalizes the mother’s values,” (Elkind, *Hurried* 143) similarly stresses the adult’s influence on the child. *Critters* visualizes this type of socialization as Brad assumes his father’s role as protector of the household when his father finds himself debilitated and asserts his power by instructing the adults, “Stay here. If I need you, I’ll holler.” With the notable absence of adults in *The Children of the Corn*, Job and Sarah appear eager to incorporate the values of an adult couple who accidentally stumble upon the children’s town in which all of the adults were slain by a child religious cult. Upon meeting the adults, the children disassociate themselves from their

peers, and Job aids the adult male, Burt, when the demon from the corn attacks him. Because each child is provided with a member of their own sex with which to identify, *The Children of the Corn* supports Freud's supposition that gender roles influence socialization and provides an example of "an elaborate process of incorporation that came about as a part of emotional identification" (Elkind, *Hurried* 143).

Operant Conditioning

Behavior psychologist B.F. Skinner stresses the importance of learning behavior through reinforcement, a "stimulus' that follows a behavior and increases the likelihood that the behavior will be repeated" (Papalia 33). Thus, the probability of rewards or punishments motivates children to act either positively or negatively: in *Firestarter*, the father verbally encourages Charlie's strength and independence (he warns his adversaries, "I'd advise that you do what my daughter says"); consequently, because of her father's reinforcement, Charlie uses her pyrokinetic abilities to defeat the film's villains and pays homage to her father's reinforcement by stating, "for you, Daddy."

Several of the children in the selected horror film sample demonstrate behavior that will give them the most attention: "The attention of people is reinforcing because it is a necessary condition for other reinforcements from them. In general, only people who are attending to us reinforce our behavior. The attention of someone particularly likely to supply reinforcement—a parent, a teacher, or a loved one—is an especially good generalized reinforcer and sets up especially strong attention-getting behaviors." (Skinner 78)

With his desire to warn the adults about his cousin's evil nature (he informs his aunt, "Henry tried to kill Connie"), Mark in *The Good Son* exemplifies the behavior a child seeking positive attention; because of his compulsion towards violence and delinquent behavior (causing a multiple-car collision, drowning his brother, smoking), his cousin, Henry, signifies a child searching for negative attention.

Research suggests that "Parents of children who later become antisocial often fail to reinforce good behavior and are harsh or inconsistent or both in punishing misbehavior" (Papalia 408): the erratic punishment *The Bad Seed's* Rhoda receives from her mother, perhaps, implies that her murderous tendencies stemmed from a lack of parental direction. Consequently, due to inconsistent reinforcement, Rhoda feels no guilt in murdering a classmate just because the teacher awarded him the spelling bee pendant that she felt she deserved to win; soon after this incident, her mother fearfully realizes her inability to change her daughter's devious behavior. In conclusion, a number of the horror films viewed presented vivid examples of children exposed to positive and negative reinforcement.

Parent-Child Contracts

Parent-child contracts presuppose that "at each stage of development parents require children to: demonstrate responsibility in return for freedom, achieve in return for support, and to be loyal in return for commitment" (Elkind, *Child* 89). These contracts found inherent within the parent-child relationship produce healthy children, providing that parents continually modify the contracts to best suit the age and maturity of the child. The father-son relationship shown in *Stir of Echoes* exhibits elements of the loyalty-commitment contract: because his father encourages his son's supernatural abilities, Jake develops family loyalty; thus, by reminding his mother not to forget her purse that contained a knife which she would later use to defend herself, Jake plays an instrumental role in saving his parents' lives. Other characters, such as John and Pearl in *Night of the Hunter*, who become adopted and socialized by Miss Cooper, establish positive parent-child contracts, because their guardian figures provide them with reasonable expectations, such as completing simple household chores (washing dishes, laundry) and reciting prayers.

When parents negate their contracts and "habitually demand behaviors that are either below or beyond the child's level of competence, we speak of 'developmental exploitation.' Such exploitation can result in children who engage in neurotic delinquency" (Elkind, *Child* 89). *Interview with the Vampire* provides a symbolic example of a violation between the parent-child contract by presenting the character of Claudia who matures mentally but not physically. Because she remains in the body of a twelve-year-old despite the fact that she has reached adulthood mentally, her two vampire father-figures, Lestat and Louis, continually undermine her maturity: after presented with a doll by Lestat, Claudia resentfully screams, "Do you want me to be a doll forever?" The calculated manner in which Claudia later plans Lestat's murder presents an extreme, exaggerated child reaction to a parent's inability to comply with his side of the parent-child contract. Thus, in the horror films examined, healthy parent-child contracts create close family bonds, while violations of the parent-child contract commonly provide a plausible motive for a child's deviant behavior.

Findings

Through my research, I observed that, in general, the portrayal of children in the horror genre seems to complement the findings of many sociological and psychological studies focusing on the child as related to the family. The great emphasis placed on the child characters in horror films seemingly corresponds to values that society places upon children. In regards to the nuclear family, I found that less of a correlation existed between the child stability and the two-parent family environment than I had initially expected; instead of fostering the children's general well-being, the

nuclear family seems to produce as many unstable children as other types of families. The studies on the single-parent family showed flexibility when citing the potential effects the one-parent home has on children, ranging from increased likelihood of delinquency to no discernable effect. Consequently, the horror films reflect these diverse points of view concerning the single-parent family. Though only two films depicted the abusive family, they both corresponded to the common psychological assertion that abuse adversely affects children. The films also provided examples of all of the family socialization theories examined: modeling, identification and internalization, operant conditioning, and parent-child contracts. Not only did the horror genre appear to visualize these theories, but they also seemed to portray the extremes of each theory by demonstrating both negative and positive implementations and depicting its consequent effects on children.

Conclusion

As indicated, the horror genre provides the film viewer with diverse family types and parenting skills affecting children of every age who possess distinctive and often supernatural strengths and faults. By observing the family structure and the parent-child relationship depicted on screen in correlation to the child's behaviorisms and attitudes, the viewer, perhaps, gains insight into certain psychological and sociological theories supporting the family environment's influence on the child. Thus, the horror genre provides its audience members with more than a cheap thrill for it reflects society's perception of cultural values concerning children.

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Test Methods for Composite Materials

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Abstract

The general aviation industry has made wide use of composite materials for aircraft structural parts. Currently, four basic standard tests prescribed by the American Society for Testing Materials (ASTM) are used to determine certain mechanical properties of composite materials for the purpose of monitoring the quality of the materials. These tests are used routinely by vendors as well as customers to assure that the materials meet the specifications assumed by the engineers who design the final product. The time required to perform these quality assurance tests adds greatly to the cost of the final product. This project involves the examination of a new set of tests that will be less time consuming, and, thus, less costly to conduct. The new set of tests will be done with a three-point bend fixture. There will be a long-span three-point bend test to determine flexural modulus and flexural strength, and a short-span three-point bend test to determine shear strength. The new tests must be as successful as the current standard tests in detecting substandard material performance. The major purpose of this investigation is to determine whether the proposed tests are as successful as the current standard tests in identifying material abnormalities. (Students Marcus Hart, Shu Hayes, Eric Hein, Errick Robles, Theresa Walker, and Rebekah Whitten initiated this project at the beginning of the Spring 2002 semester after completing a class in Composite Materials during the Fall 2001 semester. After the end of the Spring semester, the project was continued by Errick Robles during the Summer 2002 session).

Introduction

The general aviation industry has dominated the growth of using composites materials for aircraft structure. The labor and subsequent cost involved in developing databases and conducting the appropriate testing for the purpose of monitoring material quality has significantly increased. A question has arisen as to the necessity of the number of tests required for monitoring the quality of material. Are all the present quality control and assurance methods really needed to guarantee a safe and consistent material supply? Is it possible to obtain sufficient information about the quality of a composite material using alternate (and fewer) tests for the purpose of saving time and ultimately costs?

Test specimens will be produced from panels of "normal" quality and from panels of "substandard" quality. These specimens will then be tested by both the current standard methods and by the new

proposed methods. The new methods must be as successful as the current standard methods in detecting substandard material performance for the new methods to be suggested for adoption. For each test conducted, between five and ten specimens are tested for statistical reliability. The four standard test methods now being used include the following: D6953, a compression test for determining compressive modulus and compressive strength; D30394, a tension test for determining tensile modulus and tensile strength; D53795, a V-notch shear test for determining in-plane shear strength; D23446, a short beam shear test for determining inter-laminar shear strength.

The two tests proposed to replace the four tests now being used are as follows: (1) a short-span three-point bend test and (2) a long-span three-point bend test. The long-span three-point bend test would be used to determine flexural modulus and flexural strength. The short-span three-point bend test is the same as D2344 currently being used for determining inter-laminar shear.

Motivation

The purpose of this study is to compare baseline data from the standard tests currently being used with the data from the three-point bend tests. In addition, this study will be used to explore the detectability of changes encountered in materials that would typically be detected by the current standard test methods. The basic ply materials used to fabricate the test panels from which the specimens will be machined are (1) pre-impregnated plain weave fabric, (2) pre-impregnated uni-tape, and (3) plain weave dry fabric and liquid resin. After the panels are fabricated and the test specimens machined from the panels, the test specimens will be tested to failure according to (1) the currently used standard test methods, and (2) the proposed three-point bend tests. The test data will be examined to determine if the proposed three-point bend tests can identify material irregularities as well as the current standard tests. For each test panel fabricated, a "duplicate" panel will be made, but will contain an irregularity to simulate substandard material. The idea is to determine if the proposed three-point bend tests will be able to detect the difference in strengths between the "good" panels and the panels with irregularities as well as the current standard tests.

Goals

Specifically, the test results will be examined to determine if the proposed three-point bend tests detect the changes in the material properties as well as the current standard tests. If the proposed three-point bend tests cannot detect the difference in properties between the "good" panels and the "substandard" panels as well as the current standard tests, the possibility of using another test in addition to the proposed three-point bend tests will be explored. Should the proposed three-point bend tests successfully detect the changes in the material properties, a set of test standards will be developed.

Test Matrix

The test matrix for this project is given in Tables 1 and 2. There are three major tasks to perform. In task 1, the test specimens are machined from panels made from plies of plain weave carbon fabric pre-impregnated by the manufacturer with partially cured epoxy. There are two sets of panels. One set of panels is cured according to the manufacturer's specifications. The other set is over-cured for the purpose of producing "substandard" or "inferior" panels.

Task 2 is a repeat of task 1 except the panels are made from plies

of uni-tape. A uni-tape ply has all the carbon filaments in the same direction and they are pre-impregnated by the manufacturer with partially cured epoxy.

In task 3, the plies of plain weave carbon dry fabric are impregnated with liquid epoxy by the project investigators, and cured at room temperature. There are three sets of panels. One set of panels is the "good" set. Another set has the liquid resin contaminated with a cross-linking inhibitor to produce inferior quality panels. The third set has the dry fabric exposed to a release agent to produce inferior panels.

Table 1

TASK	FABRIC	LAYUP	CURE	VARIABLE	TEST	STANDARD
1a	"Plain Weave, Prepreg"	"14 ply, 12 x 48"	"ramp 5 deg/ min, dwell 100 min. at 270 deg, ramp -5 deg/ min"	None	"9 ~ Tension (E11T, SLT) 9 ~ Compression (E11C) 11 ~ Compression (SLC) 12 ~ v-notch (SLTS) 10 ~ Short Beam shear"	"ASTM D 3039 ASTM D 3410 ASTM D 3410 ASTM D 5739 ASTM D 2344"
	"Plain Weave, Prepreg"	"22 ply, 12 x 12"	"ramp 5 deg/ min, dwell 100 min. at 270 deg, ramp -5 deg/ min"	None	"10 ~ 3 point bend (E11B, SLC)"	NONE
1b	"Plain Weave, Prepreg"	"14 ply, 12 x 48"	"ramp 5 deg/ min, dwell 100 min. at 270 deg, ramp -5 deg/ min"	"Additional cure: same as original except dwell at 270 deg for 800 min and cured again at 300 deg for 300 min."	"12 ~ Tension (E11T, SLT) 10 ~ Compression (E11C) 12 ~ Compression (SLC) 12 ~ v-notch (SLTS) 11 ~ Short Beam shear"	"ASTM D 3039 ASTM D 3410 ASTM D 3410 ASTM D 5739 ASTM D 2344"
	"Plain Weave, Prepreg"	"22 ply, 12 x 12"	"ramp 5 deg/ min, dwell 100 min. at 270 deg, ramp -5 deg/ min"	"Additional cure: same as original except dwell at 270 deg for 800 min and cured again at 300 deg for 300 min."	"10 ~ 3 point bend (E11B, SLC)"	NONE
2a	Uni-tape	"0 deg, 20 ply, 12 x 24"	"ramp 5 deg/ min, dwell 100 min. at 270 deg, ramp -5 deg/ min"	None	"9 ~ Tension (E11T, SLT) 9 ~ Compression (E11C) 11 ~ Compression (SLC) 10 ~ Short Beam shear"	"D 3039 D 3410 D 3410 ?"
	Uni-tape	"0/90 deg, 20 ply, 12 x 6"	"ramp 5 deg/ min, dwell 100 min. at 270 deg, ramp -5 deg/ min"	None	"12 ~ v-notch (SLTS)"	D 5379
	Uni-tape	"0 deg, 32 ply, 12 x 12"	"ramp 5 deg/ min, dwell 100 min. at 270 deg, ramp -5 deg/ min"	None	"12 ~ 3 point bend (E11B, SLC)"	NONE
2b	Uni-tape	"0 deg, 20 ply, 12 x 24"	"ramp 5 deg/ min, dwell 100 min. at 270 deg, ramp -5 deg/ min"	"Additional cure: same as original except dwell at 270 deg for 800 min and cured again at 300 deg for 300 min."	"9 ~ Tension (E11T, SLT) 9 ~ Compression (E11C) 11 ~ Compression (SLC) 10 ~ Short Beam shear"	"D 3039 D 3410 D 3410 ?"
	Uni-tape	"0/90 deg, 20 ply, 12 x 6"	"ramp 5 deg/ min, dwell 100 min. at 270 deg, ramp -5 deg/ min"	"Additional cure: same as original except dwell at 270 deg for 800 mi, and cured again at 300 deg for 300 min."	"12 ~ v-notch (SLTS)"	D 5379
	Uni-tape	"0 deg, 32 ply, 12 x 12"	"ramp 5 deg/ min, dwell 100 min. at 270 deg, ramp -5 deg/ min"	"Additional cure: same as original except dwell at 270 deg for 800 min and cured again at 300 deg for 300 min."	"12 ~ 3 point bend (E11B, SLC)"	NONE

Table 2

TASK	FABRIC	LAYUP	CURE	VARIABLE	TEST	STANDARD
3a	"Plain Weave, carbon"	"wet, 14 ply, 12 x 48"	"ramp 5 deg / min, dwell 100 min. at 270 deg, ramp -5 deg / min"	None	"9 ~ Tension(E11T, SLT) ? ~ Compression (E11C) 11 ~ Compression (SLC) 12 ~ v-notch (SLTS) 10 ~ Short Beam shear"	"ASTM D 3039 ASTM D 3410 ASTM D 3410 ASTM D 5739 ASTM D 2344"
	"Plain Weave, carbon"	"wet, 22 ply, 12 x 12"	"ramp 5 deg / min, dwell 100 min. at 270 deg, ramp -5 deg / min"	None	"12 ~ 3 point bend (E11B, SLC)"	NONE
3b	"Plain Weave, carbon"	"wet, 14 ply, 12 x 48"	"ramp 5 deg / min, dwell 100 min. at 270 deg, ramp -5 deg / min"	Contaminate fabric with release agent	"9 ~ Tension(E11T, SLT) 9 ~ Compression (E11C) 11 ~ Compression (SLC) 12 ~ v-notch (SLTS) 10 ~ Short Beam shear"	"ASTM D 3039 ASTM D 3410 ASTM D 3410 ASTM D 5739 ASTM D 2344"
	"Plain Weave, carbon"	"wet 22 ply, 12 x 12"	"ramp 5 deg / min, dwell 100 min. at 270 deg, ramp -5 deg / min"	Contaminate fabric with release agent	"12 ~ 3 point bend (E11B, SLC)"	NONE
3c	"Plain Weave, carbon"	"wet, 14 ply, 12 x 48"	"ramp 5 deg / min, dwell 100 min. at 270 deg, ramp -5 deg / min"	Contaminate resin with inhibitor	"9 ~ Tension(E11T, SLT) 9 ~ Compression (E11C) 11 ~ Compression (SLC) 12 ~ v-notch (SLTS) 10 ~ Short Beam shear"	"ASTM D 3039 ASTM D 3410 ASTM D 3410 ASTM D 5739 ASTM D 2344"
	"Plain Weave, carbon"	"wet 22 ply, 12 x 12"	"ramp 5 deg / min, dwell 100 min. at 270 deg, ramp -5 deg / min"	Contaminate resin with inhibitor	"12 ~ 3 point bend (E11B, SLC)"	NONE

Statement of Work Done

Two 14-ply, 12"x 48" panels consisting of plies of plain weave carbon fabric pre-impregnated with epoxy resin were made. Once assembled, one panel was cured according to the manufacturer's specifications, while the second panel was over-cured by a factor of eight (cured eight times longer). Both panels, however, were cured at 270 degrees F. Next, tabs were placed on the panels so that the machined specimens could be properly gripped in the testing machines. The panels were then machined into specimens for tensile and compressive testing. Nine specimens were tested for tensile modulus (E11 T) and nine for tensile strength (SLt). These specimens were 1" wide and 0.125" thick. Eleven specimens were tested for compressive strength (SLc). These specimens were 0.5" wide and 0.125" thick. Six specimens were tested for compressive modulus (E11C). These were also 0.5" wide and 0.125" thick. Twelve specimens were V-notch specimens and tested for in-plane shear strength (SLTs) and shear modulus (GLTs).

The tensile and compressive moduli were determined from data taken with an extensometer, while strain gages were placed on the V-notch shear specimens to obtain the shear modulus. The specimens used for the compression tests were end grinded to make the end surfaces level to allow for consistent testing. The

edge surfaces of the V-notch test specimens were also grinded to insure accurate testing. Testing was done according to ASTM standards; however, the specimens made from the over-cured panel have not yet been tested.

The test results for the specimens machined from the panels cured according to the manufacturer's specifications are given in Tables 3, 4, 5 and 6.

For the three-point bend tests, two 22-ply 12" x 12" panels of plain weave pre-impregnated fabric were produced. One was cured according to the manufacturer's specifications, while

Statistical Analysis

The two-sided t-test is used in the analysis to determine if the null hypothesis should be rejected (Miller 245-246). The null hypothesis involves a statistical calculation to determine if there is a difference in mechanical properties between the "good" panel and the "substandard" panel. The null hypothesis is rejected if the value of t falls outside the level of significance chosen. If the null hypothesis is rejected, then a difference between the two specimens can be detected and an alternative must be chosen. If there is no evidence to show that the two specimens are not the same, the null hypothesis must be accepted. The value t is

Table 3: Tension Specimens

Specimen #	Area (in ²)	Modulus (Msi)	Strength (psi)	Peak Load (lb)
1	0.139	6.78560398	94386.12	13119.67
2	0.139	7.4489434	92013.45	12789.87
3	0.139	7.1798579	92111.51	12803.5
4	0.139	7.10540038	93524.32	12999.88
5	0.139	bad data	Bad data	
6	0.139	bad data	Bad data	
7	0.139	6.820574	100838.85	14016.6
8	0.139	6.83918	95417.41	13263.02
9	0.139	6.710555	93327.63	12972.54

Table 4: Compression Strength Specimens

Specimen #	Area (in ²)	Strength	Peak Load (lb)
1	0.0624246	103317.1218	6449.53
2	0.061843941	106105.6244	6561.99
3	0.062193719	98504.48121	6126.36
4	0.06211277	98023.96512	6088.54
5	0.062237095	95168.80568	5923.03
6	0.06233115	41136.735	2564.1
7	0.062499998	33201.44133	2075.09
8	0.062662465	94288.82186	5908.37
9	0.062993488	98401.4419	6198.65
10	0.063343834	98774.88667	6256.78
11	0.0639375	50607.54643	3235.72

Table 5: Compressive Modulus Specimens

Specimen #	Area (in ²)	Modulus (Msi)	Peak Load (lb)
1	0.06936875	6.797	4269.020
2	0.067284	6.761	4555.938
3	0.0679225	7.274	4548.776
4	0.068544	7.444	4279.822
5	0.0701255	6.645	4768.997
6	0.0659025	7.204	4408.452
7	0.0699425	6.534	4560.973
8	0.066155	7.042	4647.640
9	0.0664075	6.905	4683.728

Table 6: V-notch Shear Specimens

Specimen #	Area (in ²)	Modulus (Msi)	Strength (psi)	Peak Load (lb)
1	0.054926	0.629453	18701.52569	1027.2
2	0.059632	0.641792	17980.27904	1072.2
3	0.057331	0.5165	18274.58094	1047.7
4	0.05572	0.639413	18738.33453	1044.1
5	0.061344	0.507908	17659.42879	1083.3
6	0.06117	0.422243	16910.25012	1034.4
7	0.05609	0.666913	18270.63648	1024.8
8	0.056733	0.624912	18955.45802	1075.4
9	0.058329	0.624912	17924.18865	1045.5
10	0.055695	0.649143	16439.53676	915.6
11	0.056226	0.560079	18514.56621	1041
12	0.055742	0.519296	18257.32841	1017.7

determined using the coefficient of variation, the mean, and the number of specimens used. In this project "normal" panels and panels of supposedly "inferior" quality were produced. Both a standard set of tests and a proposed, but reduced number of tests, are conducted to determine if the proposed tests can identify inferior quality as well as the standard test methods. The statistical analyses are used to make this determination.

The value v is the degrees of freedom and it is calculated using the number of specimens in group one (normally cured), plus the number of specimens in group two (over cured) minus two. At a 99% confidence level the difference in the normal and over cured tensile strength specimens were very small so the null hypothesis was accepted. The tensile modulus specimens fell outside of the level of significance, so the null hypothesis was rejected. Both the compressive strength and modulus were accepted, showing that there was not enough evidence to conclude that the quality of the specimens were not the same. The null hypothesis was accepted for the short beam shear specimens. For both the flexural strength and the flexural modulus the null hypothesis was rejected because the value of t fell outside the boundary for the level of significance chosen. For the V-notch in-plane shear strength there was a significant difference between the two specimens, so the null hypothesis was rejected. However, for the V-notch shear modulus there was no evidence to show that they were different; therefore, the null hypothesis was accepted.

Work to be Finished

The panels for task 3 are panels fabricated by using a wet lay-up method. The dry carbon fabric is first impregnated with a liquid resin according to an impregnation method listed in a September 1998 report, ARP53192. The resin mixing is accomplished according to a similar report, ARP525611, August 1996. Six panels were made combining the methods obtained from these two reports. Two of the panels serve as baseline panels. That is, they are assumed to be of normal quality. Two panels were made using resin contaminated with a cross-linking inhibitor to produce panels of inferior quality. And two panels were made with fabric that was subjected to a release agent before being impregnated with resin, again for the purpose of producing panels of inferior quality. Machining, tabbing, testing, and data reduction and analysis for the six panels are yet to be done; therefore, effectiveness of using a release agent on the fabric and cure inhibitor in the resin are not yet known, and the ability of the proposed three-point bend test method to detect a deficiency in quality has not been determined.

Any test method must be repeatable and reliable in order to be adopted as ASTM quality and control testing standards. Work on this project will be continued by Errick Robles in the composites lab at the National Institute for Aviation Research (NIAR).

Discussion of Results

Table 7 below has a summary of the results of the testing done as of this date. The testing for each material property (strength or modulus) was accomplished with a minimum of five test specimens as required by ASTM standards. From this table it is easy to see the noticeable trend occurring of increased modulus and decreased strength in every over-cured specimen except for the specimens used to determine flexural strength, in which case there was an increase in both modulus and strength. Each average value in Table 7 for compression, tension, short beam shear, and V-notch were calculated with the formulas prescribed in the ASTM standards. The flexural strength and modulus were determined using the formulas for long span referenced in ASTM D7907. No definite conclusions can be made until all of the testing is accomplished.

Summary

Upon completion of machining, testing, and tabulating the data of the remaining tasks, the necessity of the four current ASTM tests will be determined. If the two new proposed tests prove to be as successful in determining material deficiencies as the current standard tests, the proposed tests will be considered for adoption as ASTM standard tests. Testing will continue on this project until August 2002, at which time a decision will be made regarding the continuation of the project.

Points of Contact

The following people have contributed their time and skills to assist with various aspects of the project:

Dr. Bert L. Smith, Professor of Aerospace Engineering, Wichita State University

Dr. Walter Horn, Chair of Aerospace Engineering, Wichita State University

Janna McKenna, Composites Research Associate, NIAR

Yeow Ng, Composites Lab Manager, NIAR

Ala Hijazi, Graduate Research Assistant, Aerospace Engineering, NIAR

Kristina Boger, Student Assistant, Aerospace Engineering, NIAR

Table 7:

Test / Property	TASK 1A Normal cure	TASK 1B Over-cure
3 Point Bend		
Average Flexural Strength (KSI)	117.989	126.518
Average Flexural Modulus (MSI)	7.956	9.263
Compression Strength		
Average Compressive Strength (KSI)	98.709	53.685
Average Compressive Modulus (MSI)	6.956	7.492
Short Beam Shear		
Average Inner Laminar Shear Strength (KSI)	8.309	7.737
Tension		
Average Tensile Strength (KSI)	94.612	92.774
Average Tensile Modulus (MSI)	6.798	7.167
V-Notch		
Average In-Plane Shear Strength (KSI)	18.052	15.504
Average In-Plane Shear Modulus (MSI)	0.594	0.897

References

1. ARP5256 - Resin Mixing. Society of Automotive Engineers, Inc. August 1996.
2. ARP5319 - Impregnation of Dry Fabric and Ply Lay Up. Society of Automotive Engineers, Inc. September 1998.
3. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics.
4. ASTM D3039 - Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials.
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A Closer Look at Advisors' Perspective on Resiliency: Is There a Variable Worth Investigating?

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Marlene Schommer-Aikins, PhD, Faculty Mentor

Abstract

A student's ability to bounce back and continue his/her education despite the odds can be seen as a form of resiliency. Resiliency in general can have different meanings to different individuals. Student retention is one example of resiliency that is a focus of this study. In the area of academic advising, some may describe resiliency as a student who has what it takes to be a college graduate. As a paraprofessional academic advisor for the college of Liberal Arts and Sciences at my university, I see students return to college and see others leave campus life on a regular basis. If those who are returning are resilient, what characteristics or life experiences make them resilient? We will take a closer look at those with academic advising responsibilities at Wichita State University to see what their perception is on traits that stand out more in these students. Additionally, we will also discuss whether or not it is consistent with variables named in the pilot study on resiliency from Spring 2001 as well as any similarities to attitudes on learning.

A Closer Look at Advisors' Perspective on Resiliency: Is There a Variable Worth Investigating?

Over twenty years of research has been done in an attempt to decrease drop out rates and increase student retention across the nation (Astin, 1975; Tinto, 1975). Student retention is a critical issue since the national drop out rate in 2001 for PhD-granting universities is approximately 30% (Brann, 2002). It has been estimated that the minimum amount of revenue lost per student in Kansas who drops out is around \$14,400 in tuition alone (Robbins, 2000). Institutions also experience loss in bookstore, cafeteria, and residential hall revenues and institutional financial aide. Community pride and campus morale are also affected because many drops-outs still carry the frustrations and negative self-perceptions of themselves for several semesters after their return. The purpose of this study is to identify student characteristics that contribute to student retention--which can also be referred to as student resiliency.

Past research has often focused on reasons students drop out or do not complete a college degree in an attempt to identify students that are at risk. For example, Tinto (1975) focused on predicting student failure/drop out based on entrance exams and Hall & Gahn (1994) focused on predictors of student failure once they return to academic life. But, "by emphasizing the deficits and negative aspects of [an] individual, [...] we have given insufficient attention to other dimensions of the human experience such as resourcefulness, courage, coping, and recovery" (Gitterman, 2001, p. 22).

Students' ability to overcome the obstacles and continue towards graduation is called resiliency. According to *Webster's II Riverside Dictionary* (1984), resiliency is the "ability to recover rapidly, as from misfortune" as well as to "regain [one's] original shape after being bent, stretched, or compressed" (p. 595). Astin (1975, 1984) and Light (2001) states being connected and involved in extracurricular campus activities promotes resiliency. Additionally, productive interactions between students and their academic advisors have also been noted as important factors in promoting student success (Shields, 1994; Light, 2001).

Although there is an abundance of retention literature available, little research has been done in the area of student retention as it relates to resiliency. Thus, this study furthers our attempt to better understand the reasons why Wichita State University (WSU) students are resilient by uncovering advisors' perspectives on student resiliency. In Spring 2001 WSU advisors were asked to spontaneously generate a list of characteristics they perceived resilient students possessed. From that pilot study the top six perceived reasons for resiliency of WSU students were: (a) students have a focus because they understand the connection between their educational plan and future goals in terms of employment; (b) students possess personality traits that are used in a positive manner to facilitate success; (c) students have a good support system; (d) college is a priority for them; (e) college is a primary means for job security (they needed more education to keep their present job); (f) students have a significant other who is also in college. The purpose of this study is to determine if advisors' ratings of perceived reasons for resiliency will replicate the Spring 2001 findings. Furthermore, ancillary analyses were performed to examine the relationship between advisors' epistemological beliefs about the nature of knowledge and their perceived top reasons for resiliency. These ancillary data were gathered in preparation for future research.

Method

Participants

The participants in this study were 30 employed university staff (9 men and 21 women) whose responsibilities at some time included academic advising at WSU. There were 3 directors, 5 chairs/assistant chairs, 2 counselors/coordinators, 7 academic advisors, 10 professors, and 3 secretarial/clerical support staff members. Participants' total number of years in the advising field ranged from less than a year to over 35 years. All of their advising experience was at WSU. The selection process for participants began in the three months prior to first contact. Calls were made to respective colleges and department heads asking for a representative who could thoroughly aid in updating the proposed research population list that was created from a previous pilot study performed in Spring 2001. This population was then divided into three groups identifiable by their highest-ranking professional responsibilities. The three groups are labeled: Academic Administrators, Academic Advisors, and Secretarial & Clerical Support Personnel. The numbers and titles associated within each group are shown in Table 1.

Materials

Participants' perspectives on the resiliency of WSU students were measured using the Advisors' Perspective on Resiliency of WSU Students Questionnaire. This questionnaire, which was constructed specifically for this study, is composed of four sections. The first section assesses participants' professional background at WSU including their advising responsibilities, any other professional responsibilities at WSU, their total number of years in the academic field, and the total number of years of advising at WSU.

The second section assesses participants' epistemological beliefs or beliefs about the nature of knowledge and learning using a 32-item questionnaire developed from a longer questionnaire used for the last 12 years (Schommer, 1990). Participants' beliefs in the certainty and structure of knowledge as well as their beliefs in the speed and ability of learning are assessed with this questionnaire using the Likert Scale from 1 (strongly disagree) to 5 (strongly agree). Samples of items include: "The best thing about a science course is that most problems have only one right answer" and "Being a good student generally involves memorizing facts."

The third section assesses participants' degree of agreement to perceived factors affecting resiliency. This section initially begins with the statement: "Students are more likely to be resilient if..." The remainder of the section consists of 27 sentence fragments--derived from responses to Spring 2001's pilot study--that can complete the statement. Items 1 through 21 and item 27 were responses received from the survey portion of Spring 2001's pilot study. Items 22 through 26 were additional resiliency items listed by

the seven instructors interviewed in Spring 2001's pilot study. Sample sentence fragments include: "they have a good social support system," "they are academically prepared," and "college is a personal goal for them." Participants are asked to rate their degree of agreement to each sentence fragment that could complete the initial statement using a 5-point Likert Scale (1=strongly disagree to 5=strongly agree).

The last section asked participants to name the top three reasons, from the 27 resiliency items listed, as to why they believe students at WSU are resilient. The directions did not specifically request that the items be identified as the top 1, 2, or 3. Hence, in the analyses, the focus was not on whether the rating was 1, 2, or 3. Rather, the focus was on how many times any particular fragment statement was considered to be one of the top three reasons students are resilient.

Results

Analysis of Resiliency Reasons

The main analyses for this study focused on participants' perceived reasons for student resiliency. Initially the mean response for each resiliency fragment was analyzed. Participants identify the top six reasons based on mean score: (a) students "have positive perceptions of themselves--believe that they can do it," (b) students "possess and use personality traits...in a positive way," (c) students "have better time management skills," (d) students "feel that college is a personal goal for them," (e) students "believe that they can overcome any barriers they encounter," and (f) students "are academically prepared."

In order to alleviate our concerns of order affect (that participants held off to giving high ratings to earlier sentence fragments until they have seen more sentence fragments) it was decided that the main focus should be on the top three reasons participants believed students are resilient. They were able to select these top three reasons after they had been exposed to the entire list of sentence fragments and had time to reflect on all of the items. From among the top reasons selected by participants, over 50% of their responses included six reasons for resiliency. These six perceived reasons for resiliency are as follows: (a) students "have positive perceptions of themselves--believe that they can do it" (53%); (b) students "have a good social support system" (27%); (c) "college is a priority for them" (27%); (d) students "are academically prepared" (20%); (e) students "believe that they can overcome any barriers they encounter" (20%); and (f) students "have better time management skills" (20%). Table 2 shows you the top reasons based on the Top 3 selection and shows you the replication of either reasons based on the rating task in this study or reasons generated in the Vu 2001 pilot study based on spontaneous comments. As can be seen in Table 2, two statements

from Vu 2001 were replicated with the Top 3 mean of measuring reasons for resiliency. There was no replication using the rating task. Also, notice that the replicated Vu 2001 items—as they were arranged on the fragment section of the questionnaire—were early items 3 and 4. This suggests that our concern about order effect is well founded. It appears that participants were hesitant to give higher ratings to earlier items compared to later items in the listing of sentence fragments.

Ancillary Analysis for Future Research

In this study we had the opportunity to gather additional data that has the potential to contribute to future research on resiliency. This additional data involved was the assessment of advisors' beliefs about the nature of knowledge and learning. The four epistemological beliefs included beliefs in the certainty of knowledge, the organization of knowledge, the speed of learning and the ability to learn. Past research has shown a link between students' epistemological beliefs in numerous aspects of their learning (Schommer, 1990, 1994). For example, the more students believe that the ability to learn can be improved over time, the more likely they will persist in learning difficult tasks (Dweck & Leggett, 1988). The more students believe that knowledge changes, the more likely they are to appropriately interpret tentative information (Schommer, 1990).

In this study, we took a glimpse between the relationship of advisor's epistemological beliefs and their ratings of reasons for student resiliency. Some significant correlations were found. The more the advisors believed that the ability to learn can improve over time, the more likely they were to believe that students who have positive perceptions about themselves are more resilient ($r = -.39, p < .05$). A second analysis comparing advisors who had teaching experiences to those with no teaching experience, revealed one significant finding: advisors who had teaching experience had a stronger belief that knowledge is continually changing ($F(1, 28) = 4.79, p < .05$). Since this is an ancillary analysis, a brief interpretation of this data is presented here without further discussion in this document. These two results suggest that like students who are persistent, advisors see a relationship between students' tenacity (or resiliency) and their belief that the ability to learn can improve over time as is consistent with previous literature. Furthermore, advisors who have teaching experience, who are more likely to believe that knowledge is changing, are more likely to be open to new ideas. Although we do not have evidence to support this, it may suggest that advisors who have teaching experience may be more open to listening to students' ideas and concerns and may be more open to providing students with new ideas in helping them be resilient in the classroom. This speculation may be worth further investigation in the future.

One final analysis was conducted comparing advisors who have frequent contact with students often discussing personal matters versus advisors who have infrequent contact with students and seldom—if ever—talk about students' personal matters. This led us to group participants classified as Professional Advisors, Secretarial/Clerical Staff, and Coordinator/Counselor as high-contact advisors and Chair/Assistant Chair, Director/Assistant Director, and Instructor/Professor as low-contact advisors. A one-way analysis of variance (ANOVA) was conducted using the type of advisor as the independent variable and the number one reason for resiliency (based on both top reasons and rating scores): students' "have a positive perception of themselves—believe that they can do it." Results of this analysis revealed a significant difference between these advisors. Advisors with high contact and the opportunity to talk about personal relationships gave a higher rating to the positive self-perception of students as a reason for resiliency ($F(1, 28) = 4.31, p < .05$).

Discussion

Past research on student retention has often taken a pessimistic point of view. The goal was to attempt to determine why students fail. More often than not the interpretation was heavily influenced by researchers' perceptions that grades were the predictors of failure (Hall & Gahn, 1994; Tinto, 1975). In contrast, the research being reported here takes an optimistic point of view in trying to determine why students are resilient. The issue of resiliency is critical to student retention. Interestingly enough, in this study, advisors' top perceived reasons why students at WSU are resilient has nothing to do with grades. Advisors perceived that an important characteristic of resilient students is their positive perceptions of themselves—their personal view that they can be successful in college. Despite the method used for determining the top six choices, the positive perception item is rated number one. Analyses of advisors with frequent and personal contact versus advisors with infrequent and non-personal contact revealed that high-contact advisors had a stronger belief that self-perception was a critical issue in resiliency. It is possible that without the personal contact or frequent contact, an academic advisor could not be sensitive to this student characteristic.

Holding college as a priority as well as having a good social support system also seems to be a dominant characteristic. This is reflected in the replication of Vu 2001's reasons with the top reasons based on the top 3 reasons shown in our deeper analysis. Three other critical reasons were also identified (based on the fact that they were shared across both methodologies used in this study) as students "are academically prepared", "they can overcome any barriers they encounter" and they have good time management skills. These characteristics, although viewed only scholastically in this study, can be connected to and stem from the many facets of a student's life including family, social, and job competency (Gitterman, 2001).

This study makes a contribution by focusing on what seems to work or contribute to student resiliency. It is a contribution of a positive approach towards the study of retention. As written by Martin Krovetz (1999), "[the] problem focus model offers little help to educational and community leaders who would prefer a more proactive position...based on building capacities, skills, and assets—building resiliency." (p. 6). As educational leaders, studying resiliency and not solely focusing future efforts on retention may be the key in assisting students in obtaining a college degree. If students' positive self-perceptions are so important to student success, then perhaps there should be more programs to encourage this concept.

Caution should be taken in these findings because they were based solely on responses received from volunteers who received and responded to the questionnaire via campus mail. Future research should be based on a more random sample. Other limitations include the fact that only the perceptions of those who at some time have been employed in an advising capacity were surveyed. Additionally, these perceptions were only focusing on perceived reasons for resiliency of students who were at some time enrolled at WSU. It must not be forgotten that these perceived resiliency factors are based on opinions. Therefore, causal claims cannot be made on the findings of this research.

The next study will be conducted in Fall 2002. In that study, returning adult students will complete the same set of questionnaires. This will allow comparisons to be made between adult returning students, faculty advisors, and instructors to determine if their perceptions on resiliency are similar.

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Table 1: Actual Participants by Job Title

ACADEMIC ADMINISTRATORS	ACADEMIC ADVISORS	SECRETARIAL/ CLERICAL SUPPORT STAFF
Deans/Asst Deans	Professional Academic Advisors	Office/Advising Specialists
Directors/Asst Directors	Paraprofessional Advisors	Departmental Secretaries
Chairs/Asst Chairs	Departmental Advisors	Records Clerks
Counselors/Coordinators	Professors/Faculty	

TABLE 2. Top 6 Resiliency Reasons by Frequency, Mean Rating Task, and Vu Spring 2001 Pilot Study

TOP REASONS BASED ON FREQUENCY OF TOP 3	REPLICATION	RESILIENCY ITEM #
1. Students have positive perceptions of themselves (believe that they can do it).	RATING TASK	22
2. Students have a good social support system.	Vu 2001 Pilot Study	3
3. College is a priority for them.	Vu 2001 Pilot Study	4
4. Students are academically prepared.	Rating Task	10
5. Students believe that they can overcome any barriers they encounter.	Rating Task	15
6. Students have better time management skills.	Rating Task	21

Prevention of Intestinal Cancer by Antioxidants in Wheat

Vanessa A. Melendez, *WSU McNair Scholar*

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Abstract

Wheat bran, which is rich in dietary fiber as well as antioxidants and vitamins, is associated with reduced risks for colon and breast cancer. This study investigates if antioxidants in several varieties of wheat reduce intestinal tumor incidence and tumor mass in MIN mice. In this experiment, 10 MIN mice were assigned to one of 11 groups: 1) control group, 2) five groups fed diets containing 45% whole wheat, and 3) five groups fed diets containing 45% wheat bran. Each experimental group was fed one of five varieties of wheat. After 10 weeks on their diets, the mice were euthanized with CO₂. The intestines were removed and data were collected on tumor incidence and tumor mass. Statistical analysis revealed that the control group had the greatest tumor incidence and tumor mass. A pattern was noted in the groups fed the five varieties of wheat—the amount of antioxidants in the wheat varieties increased, tumor incidence and tumor mass decreased. The principal conclusion is that there is an inverse relation between antioxidants in wheat and intestinal tumor incidence and tumor mass in MIN mice.

Introduction

Four years ago, Jay Monahan died of colon cancer at the age of 42. You know him as Katie Couric's husband. She is the popular co-host of NBC's Today Show. Katie recalls that the only clue they had that anything might be wrong was that her husband often felt tired and achy. But as far as Jay was concerned, that was not a cause for alarm. He worked as a TV legal analyst and was busy covering O.J. Simpson's civil trial for MSNBC, shuttling back and forth between California and the home he shared with his wife and daughters in New York City. The family thought it would get better when his schedule changed, but he didn't improve.

Even after the trial ended in January 1997, Jay's fatigue persisted. He went to see a doctor a few months later because the pain was so severe. By then it was too late. His X-rays and other scans revealed that he was suffering from advanced colon cancer, so advanced that the cancer had spread to his liver. He died two weeks after his 42nd birthday.

Like most Americans, Katie and Jay had never thought much about colon cancer. They had no reason to. Jay was young, healthy, and had never smoked. There was no family history of colon

cancer. Until her husband became sick, Katie did not realize how common, how deadly, and how preventable colorectal cancer (which includes the colon and rectum) is (Gorman, 2002).

Purpose of Study

Cancer researchers believe that simply changing our diet can prevent 70% of colon cancer (Willett, 2002). This theory is the purpose of this experiment. We want to show that antioxidants in wheat reduce intestinal tumor incidence (or the number of tumors) and tumor mass in mice. The Flossie West Memorial Trust Foundation and the Kansas Wheat Commission funded this research, making this study the first medical research project ever funded by the Kansas Wheat Commission.

For many years, nutritionists have told us that the foods you eat directly affect your health. That effect may be positive or negative. For example, several foods have been found to be linked to an increased risk for colon cancer. Eating more than eight ounces of beef a week increases your chance of getting colon cancer (Goyns, 1999). Alcohol is significantly and directly linked to a striking risk for colon cancer (Stemmermann, Nomura, Chyou, & Yoshizawa, 1990). Wheat bran has been found to decrease colorectal cancer risk (Earnest, Einspahr, & Albert, 1999) and significantly lower the number of intestinal tumors in laboratory rodents (Reddy, 1989).

According to the American Cancer Society, colorectal cancer strikes 130,000 men and women each year in the U.S. It is more common after the age of 50, but, as in Jay Monahan's case, younger people are also affected. This disease will kill 55,000 Americans annually, a fourth of them under 50, making it the second leading cause of death due to cancer, after lung cancer (Gorman, 2002).

The colon is the first six feet of the large intestine, which is part of the digestive system. By the time food reaches your colon, most of it has been digested. The colon serves to absorb water, which will later enter the bloodstream. It also acts as a storage organ for the remaining indigestible solids, bacteria, and other material that compose feces. Finally, the colon functions to evacuate feces at more or less regular intervals (Ross, 1982).

The colon, along with other organs of your body, is under constant attack by damaging molecules called free radicals. Free radicals are those unstable, toxic compounds that travel through our bodies capturing electrons from healthy cells, causing us to age faster, and increasing our risk of other health-robbing exposures.

The human body is designed to handle free radicals, but when the body is subjected to stress—such as emotional pressures, overexertion, environmental pollutants, and the aging process—free radicals can quickly exceed your body's natural defenses. Once free radicals impact cell structure and function, your DNA (Deoxyribonucleic Acid) is damaged and your chances of getting cancer increase (Antioxidants, 2002).

Antioxidants, however, are enzymes that help neutralize free radicals before they can cause cell damage. If they can keep your cells from being damaged, they can help prevent cancer-causing mutations. Eating a balanced diet rich in antioxidants may be the best way to neutralize free radicals.

Wheat is a grain that is high in antioxidants. Of all of the grains in our diet, wheat has the highest level of antioxidants. If antioxidants can help prevent cancer-causing mutations, they can dramatically reduce your risk of getting colon cancer (Takemoto & Klopfenstein, 2001).

This study used whole wheat and wheat bran. What are the differences between the two? Wheat bran has more antioxidants than whole wheat. Structurally, there is also a difference. Whole wheat has three components. It consists of the embryo, fiber, and antioxidants, along with carbohydrates. Wheat bran, however, is just the embryo (Pomeranz, 1979). The purpose of this study was to find the variety of wheat that was most beneficial in fighting colon cancer. We hypothesized that antioxidants in wheat reduce intestinal tumor incidence (or the number of tumors) and tumor mass in mice.

Method

In order to develop cancer, you have to acquire gene mutations. The MIN (Multiple Intestinal Neoplasia) mouse is a strain of mice that develops intestinal cancer spontaneously. This animal model has been used for a decade in cancer research because it possesses the same gene mutations that humans develop, which can lead to colon cancer.

110 MIN mice were assigned to 11 groups. In the control group, the mice were fed a rodent stock diet. A laboratory rodent diet is a constant-nutrient formulation recommended for rats, mice, and hamsters (Rodent Diet, 1999). In the five whole-wheat groups, the mice were fed diets containing 45% whole wheat. In the five wheat-bran groups, the mice were fed diets containing 45% wheat bran. The other 55% of the diet was the laboratory rodent stock diet, which contained vitamins, minerals, carbohydrates, and lipids.

Each experimental group was fed one of five varieties of wheat. We used Arapahoe wheat, or Arap for short, which is grown in Nebraska. We also used Ernie wheat, which is grown in Missouri. Betty and Ike wheat are grown in Kansas, and Madison wheat is grown in Maryland. After 10 weeks on their diets, the mice were euthanized with carbon dioxide. Data were collected on the number of tumors and the volume or mass of the tumors. The data were analyzed for statistical significance using ANOVA (analysis of variance).

Results

The summary statistics are as follows: body weight— $F(10, 68) = 7.97, p = .0001$; tumor number— $F(10, 68) = 4.60, p = .0001$; and tumor mass— $F(10, 68) = 4.19, p = .0002$. The means and standard deviations were collected for each variety and type of wheat (see Figure 1). Ike whole wheat had the highest mean for body weight, while Betty wheat bran had the lowest mean. Madison whole wheat had the highest standard deviation for body weight, while Madison wheat bran had the lowest standard deviation.

Body weight is important because our goal is to find the variety of wheat that caused the mice to have fewer tumors. The more tumors the mice have, the more they will weigh. As you can see from Figure 2, the mice that weighed the least were the ones that ate wheat bran. Two possible factors can explain these differences. One is that the mice that ate whole wheat actually had more tumors, and thus weighed more. The other is that whole wheat has more calories per ounce than wheat bran, so the mice that ate whole wheat gained more weight.

Arapahoe whole wheat had the highest mean for tumor number, while Ike wheat bran had the lowest mean. Arapahoe whole wheat also had the highest standard deviation for tumor number, while Madison whole wheat had the lowest standard deviation. Our goal is to discover which wheat variety caused the mice to have fewer tumors. As the number of antioxidants in the wheat increase, the number of tumors decrease. With Ike and Madison, we can see (refer to Figure 3) that their number of tumors was significantly lower than that of the control group. We can see that the wheat has caused the mice to have fewer tumors, based on the antioxidant levels in the wheat.

Arapahoe whole wheat had the highest mean for tumor mass, while Madison wheat bran had the lowest mean. Arapahoe whole wheat also had the highest standard deviation for tumor mass, while Madison wheat bran had the lowest standard deviation. Our goal is to find which wheat variety caused the mice to have smaller tumors. By looking at Figure 4, you can see that as the antioxidants in the wheat increase, the mass of the tumors decreases. This shows us that the antioxidant levels in the wheat caused the tumors to be smaller.

Finally, Figure 5 is a chart that summarizes our findings. It is the same data described above; we just combined the bars for whole wheat and wheat bran. So, for each variety of wheat, you can see how many tumors the mice had and how large their tumors were. It is much easier to see on this chart that as the number of antioxidants in the wheat increase, both variables decrease. You can see a big difference between the mice that were on the Madison wheat diet and those who were not fed any wheat. The data in this chart verifies our hypothesis.

Discussion

The principal conclusion is that there is an inverse relation between antioxidants in wheat and intestinal tumor incidence and tumor mass in MIN mice. Clearly, Madison wheat did the best job of lowering the number of tumors and their size. And now the big question; how do you know what kind of wheat variety a food product has? You don't. There is no indication on the label that states what kind of wheat is in that product. Foods containing wheat usually contain a mixed variety of wheat in them. So you could not buy Madison wheat in any grocery store. Someday in the future, you will be able to buy a food product containing a specific kind of wheat, but that will be in a minimum of 7-8 years.

There were several weaknesses in this study. One is that the mice received large dosages of wheat in their diet (almost half), as compared to the amount a human receives in his/her diet. The diets were not isocaloric, meaning they did not have the same number of calories per gram. That may explain why some of the mice gained more weight. The diets also had different fiber contents (although we focused on the antioxidant levels). This may have an effect on the number of tumors they developed since diets high in fiber may also result in fewer tumors.

Now that we have obtained these results, where do we go from here? We received funding for another year of study. The purpose of that experiment will be to determine the optimum amount of dietary wheat bran that will reduce the number of intestinal tumors and tumor load in MIN mice. Once that study is completed, we plan to conduct a clinical study using wheat products in human subjects. In that study, we want to see if wheat decreases their chance of getting colon polyps, which are tiny grape-like projections that sprout on the inside of the large intestine. These polyps are precursors to colon cancer (Gorman, 2002).

What if you could prevent the polyps from forming in the first place? Colon cancer is one of the deadliest and most preventable malignancies. Our study found that wheat reduced the number of intestinal tumors and tumor load in mice. Those of us in medical research know that every research project ends with the insatiable, "Further research is needed." Our further research has already begun—with an ultimate goal in mind.

We are striving to provide the general public with food products that will reduce their risk of developing colon polyps, and thus

colon cancer. Imagine the impact we would make if we could get high antioxidant wheat into snack products! Have you heard of a snack called Wheat Thins? Well, you do not see Wheat Thins as much as you see chips. If we can get wheat into chips, then perhaps we can reduce the risk of colon cancer for the millions of Americans that snack on chips everyday.

Once we have proven that wheat is, in fact, beneficial to humans by reducing their risk for colon cancer, we can indicate this benefit on the label of the future food product itself. Doing that, however, requires the FDA's (Food and Drug Administration) approval, and that is why we are doing these studies. Since 16% of the wheat consumed in the U.S. comes from Kansas, our farmers would see an increase in their income and that would boost our state economy. It is obvious that wheat can have a positive effect on more than just our health.

Research is completely intriguing, but it is always exciting to see a real-life event, like a medical procedure, being performed. If you want to get checked for colon polyps, you can pay a visit to your gastroenterologist for a colonoscopy—a procedure that inserts a long, flexible tube in the anus. It has a tiny camera and a light at the end, so it allows the physician to take a tour of your colon and look for any abnormalities, like polyps (What is Colonoscopy?, 2002). The tube is hooked up to the latest viewing technology—a television. It is almost like watching a movie. The plot was the colon and the abnormality was the climax. The absence of polyps and tumors was the happy ending.

There is not a book that can compare to actually watching everything being done. It was fascinating. The patient was scheduled to have colon surgery, and promptly went into the operating room. The surgeon performed a colonoscopy first, and as it turns out, the patient did not have any polyps. What he had was an ulcer. The surgery began and the colon was taken out and the ulcer was removed.

The purpose of this information is to shed some light on how important nutritional health is to your life. When you take care of yourself, your health reflects that. Hippocrates put it simply, "Let your food be your medicine and your medicine be your food." In conclusion, Thomas Edison said, "The doctor of the future will give no medicine but will interest his patients in the care of the human frame, in diet, and in the cause and prevention of disease."

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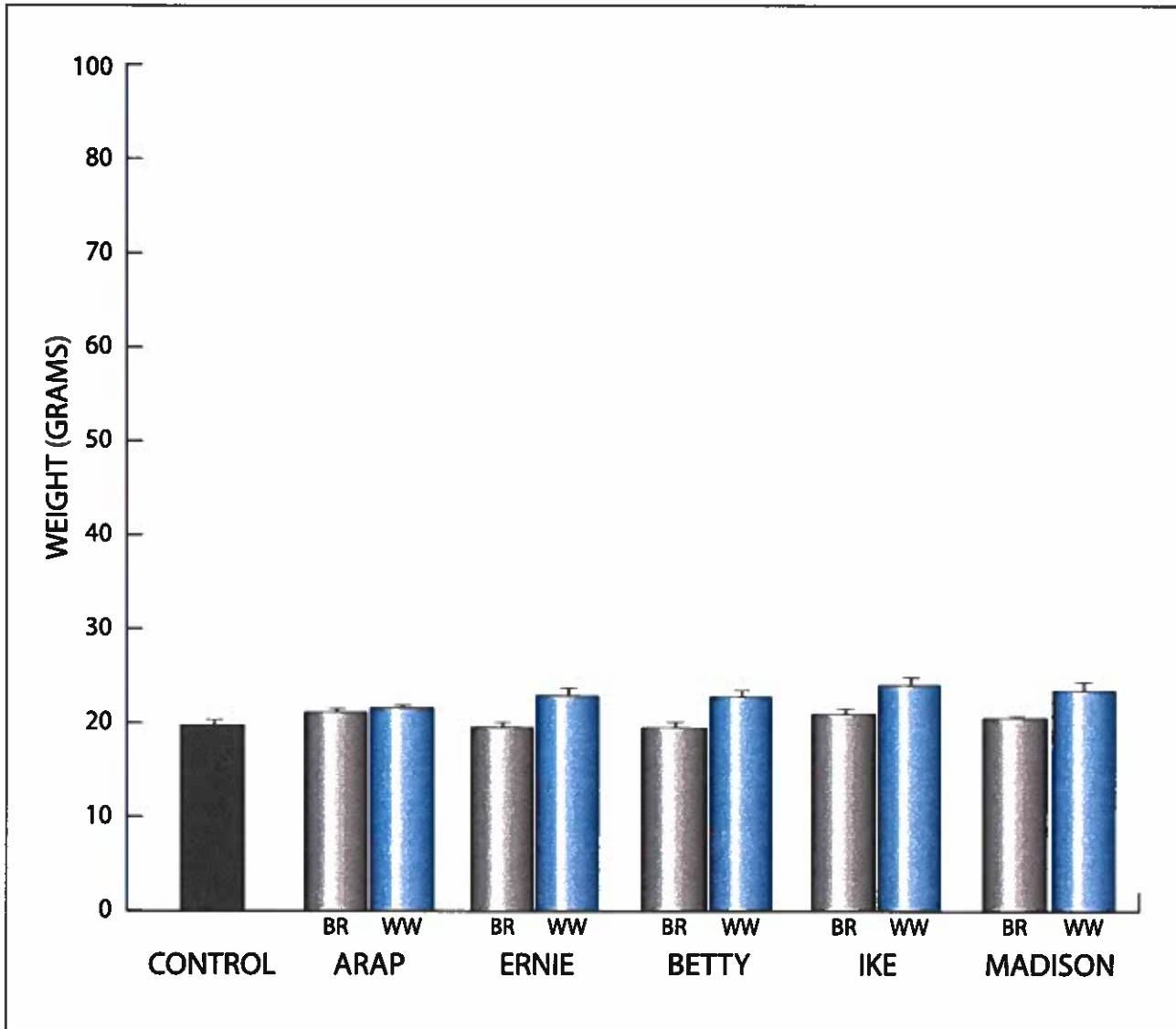
Figure 1: Summary Statistics

Variable	MEAN	Standard Deviation	MEAN	Standard Deviation
	Arap BR		Arap WW	
Body Weight	21.25	0.93	21.67	0.59
Tumor Number	17.57	7	36.89	17.44
Tumor Mass	27.4	17.74	63.36	47.01
	Betty BR		Betty WW	
Body weight	19.47	1.41	22.93	1.84
Tumor Number	18.43	11.82	16.57	12.5
Tumor Mass	16.21	12.01	21.98	20.23
	Control			
Body Weight	19.73	1.29		
Tumor Number	24.14	16.35		
Tumor Mass	51.51	36.4		
	Ernie BR		Ernie WW	
Body Weight	19.66	0.96	23.14	2.07
Tumor Number	15.43	9.34	19.43	10.34
Tumor Mass	18.59	8.75	33.62	24.06
	Ike BR		Ike WW	
Body Weight	21.19	1.17	23.99	2.14
Tumor Number	5.57	4.5	16.71	9.72
Tumor Mass	11.52	6.84	28.26	19.13
	Madison BR		Madison WW	
Body Weight	20.56	0.39	23.4	2.55
Tumor Number	10	4.73	10.43	4.28
Tumor Mass	8.37	3.79	17.51	4.44

BR- Wheat Bran WW-Whole Wheat

Figure 1 This chart provides the mean and standard deviation for each variety and type of wheat for the three variables studied.

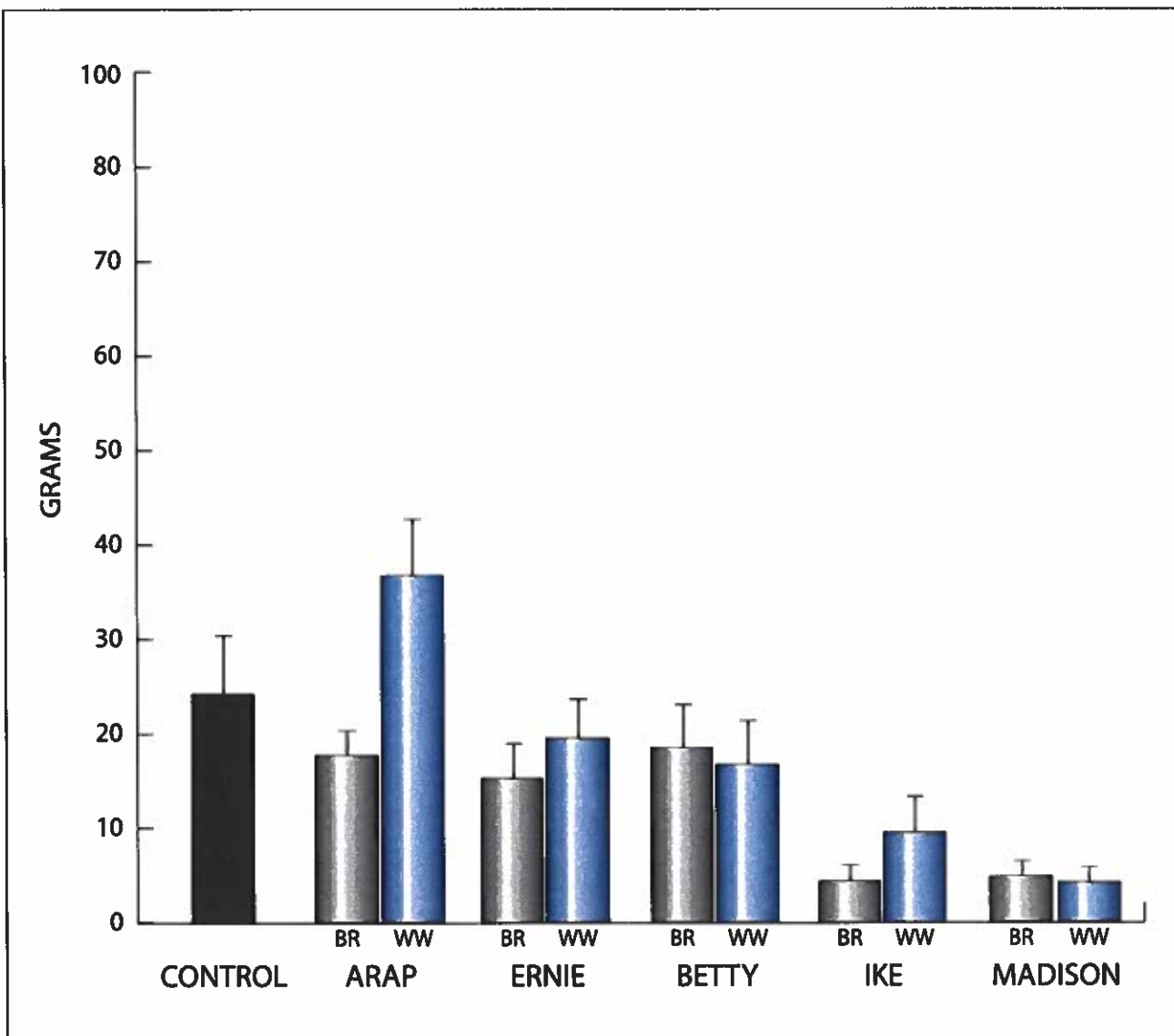
Figure 2: Final Body Weight



BR- Wheat Bran WW-Whole Wheat

Figure 2 This chart displays how much the mice weighed when they died. The mice that weighed the least were the ones that ate wheat bran. The number of antioxidants in the wheat increases from left to right, with ARAP having the least amount of antioxidants, and Madison having the most.

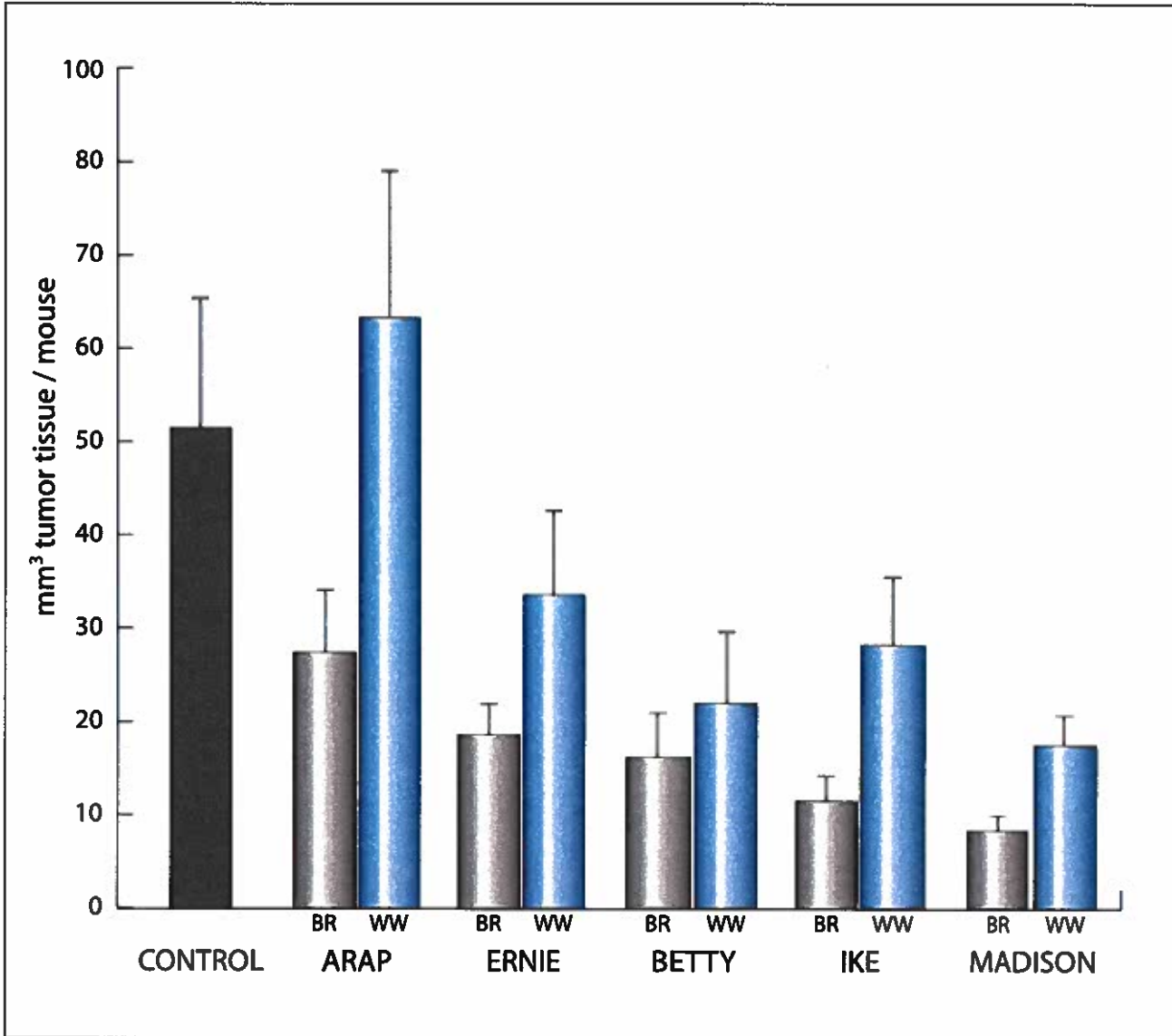
Figure 3: Number of Intestinal Tumors



BR- Wheat Bran WW-Whole Wheat

Figure 3 This chart displays the number of intestinal tumors the mice had when they died. The mice in the Ike and Madison groups had a significantly lower number of tumors than the mice in the control group.

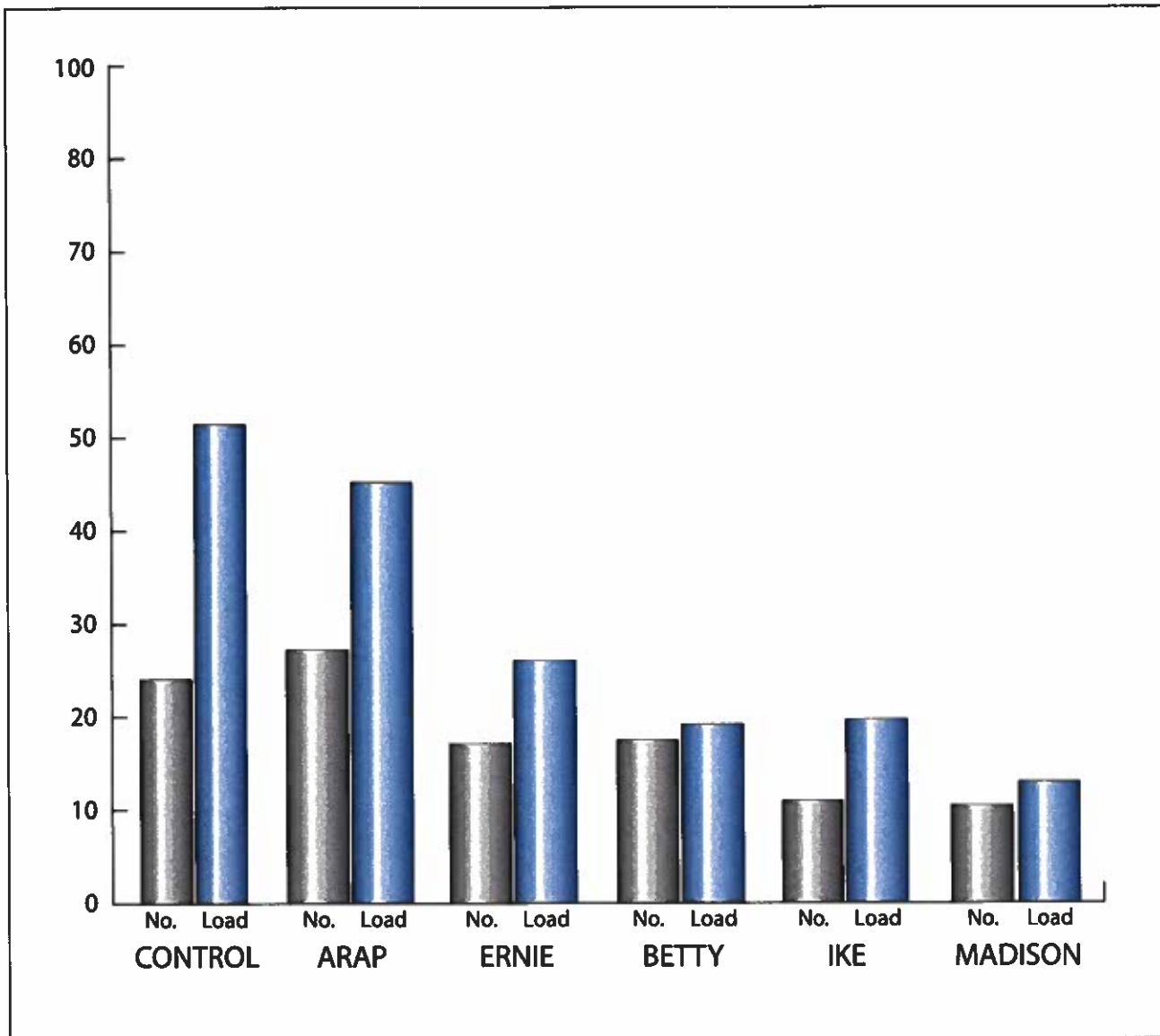
Figure 4: Tumor Load



BR-Wheat Bran WW-Whole Wheat

Figure 4 This chart displays the volume of the tumors that the mice had. This shows us that the antioxidants in the wheat caused the tumors to be smaller

Figure 5: Tumor Data Summary



No.-Number of Tumors Load-Tumor Load

Figure 5 The data in this chart summarizes our findings. It is much easier to see on this chart that as the number of antioxidants in wheat increase, both variables decrease.

Conversion Efficiencies of Metal Ions

Marcus Barber, WSU McNair Scholar

Michael Van Stipdonk, PhD, Faculty Mentor

Summary

Unlike the previous semester of research in which we focused almost exclusively on the synthesis aspect of our project concerning metal ions and their use as cleaving elements, this semester we were given the opportunity to work on the more analytical subject of energetics which were involved in our experimentation. Our project involved the comparison of conversion efficiencies of Li^+ , Na^+ , and Ag^+ with some acylated and non-acylated peptides.

The steps involved in the process included taking cationized peptide (M^+) and isolating its ion peak at an activation amplitude of 0. We then collected the M^+ ion current for one minute. The second step of the process involved fully dissociating the M^+ ion peak, which involved adding energy until the isolation peak became totally non-existent. This step was followed by collecting

the given spectra for one minute and searching for certain peaks which were denoted as $\text{a}2-1$, $\text{b}2-1$ and the $\text{b}2+17$ fragments. We then went about repeating each of these steps with at least 4 more trials to add validity to our findings and to record any possible variation which may have occurred throughout our experiment.

In order to find the conversion efficiency, we used the expression of the sum of our sequence ion abundances ($\text{b}2+17+\text{b}2-1+\text{a}2-1$) and then divided this total by the parent ion abundance. What we found included the following information: Ag^+ seemed to have a relatively high conversion efficiency, and there was a general increase in this energy level except in peptides complexed with Ag^+ . Also one of the relatively unusual patterns we found was when we used the peptide of Glycine-Proline-Alanine (GRA). There were very low conversion efficiencies which we were able to attribute to formation of the Y-ion, which was relatively rare.

Our conclusions began with a relatively frequent observation in which Ag^+ cationization always took place at much lower activation amplitude. Through this observation, we were able to come to the conclusion that Ag^+ had the highest conversion efficiency when compared to Li^+ and Na^+ , and acylation almost always raises the conversion efficiency of a metal peptide complex.

Establishing the Norm of Dissociative Behaviors in the Twenty-first Century

Carla Brown, *WSU McNair Scholar*

James Snyder, *PhD, Faculty Mentor*,

Carol Wolfe Konek, *PhD, Faculty Mentor*,

Summary

Once upon a time there was a young woman who knew something was wrong with her. She had known for a long time that she perceived the world differently from others. Every time she tried to tell someone about her perceptions, people would tell her she was fine, and nothing was wrong. For simplification her name will be Abigail. Abigail tried to act as if everything was fine until she turned twenty-one and someone told her she was thirty-five. Abigail felt panic and pain all over her body. She sought professional psychological help. The psychologist asked many questions but gave Abigail few answers and sent her home.

While at home, Abigail, realizing where the pain was coming from, searched for another professional with whom to talk. She had never “felt” anything before she was twenty-one and the pain was becoming intolerable. Receiving a referral from a friend, the young woman made another appointment. Abigail arrived at the new medical doctor’s office and again answered all of the questions. She told Dr. V. where the pain hurt the worst and about her symptoms. He promptly cut her open at the psychological origin of trauma. Staring into the abscess, the doctor told Abigail to come back once a week and let “what may” ooze from the opened “psyche” wound for awhile. But, instead of treating the infection, each visit Doctor V. would make a bigger incision. When Abigail’s insurance ran out, Doctor V. announced she needed to continue with treatment, but not with him as her treating physician. Abigail, weak from the infected gash, finally found another doctor, a psychiatrist, to assist her.

Gazing into the gaping wound, Doctor Z asked Abigail another group of questions. He seemed irritated during the interviewing. Dr. Z asked if Abigail knew her diagnosis and how she had coped with the previous treatment. Abigail answered the doctor by listing the diagnoses and added that she had not slept for weeks. She asked if Dr. Z could help heal the damage. The doctor did not believe that a fellow doctor could cut a patient open and leave the incision undone. Dr. Z also told Abigail her condition was not real. Puzzled and in pain, Abigail again left the office with her “being” exposed and vulnerable.

To make a long story shorter, Abigail had first been diagnosed with Post Traumatic Stress Disorder (PTSD). As her history and coping skills were revealed in therapy, the diagnosis of Dissociative Disorder was added to the previous diagnosis of PTSD. Dissociative Identity Disorder (DID) formerly known as Multiple Personality Disorder (MPD) was the next diagnosis given during a twenty-eight day stay in a women’s treatment facility. After obtaining her history and diagnosis, Dr. Z instantly insisted Abigail’s diagnosis was not “real” and refused to treat her or her symptoms.

Humanity is changing very quickly on many dimensions. Individually, environmentally, and globally humankind keeps racing in time toward unknown destinations. The public has numerous ways of dealing with these adjustments. One way in which people cope with change, stress, and/or trauma is by dissociating. In some instances, dissociation becomes a habitual coping skill. When dissociation creates a problem or interferes with daily activities, individuals may seek treatment from professionals in the medical, psychological, and social work fields.

Abigail is not alone. Many survivors of sexual, physical, or emotional trauma, suffering from PTSD, DD, or DID are walking around misdiagnosed, untreated, and in some cases even ignored. Often their symptoms are as obvious as Abigail’s cavernous tear. So, what is and how is dissociation defined?

The experts have several definitions of dissociation and also a separate definition for dissociation in children. How can habitual coping patterns that usually start in children before the age of six have a separate meaning for adult counterparts that have child personalities in a grown up body? In any case, most of the experts do agree “that dissociation operates on a continuum ranging from normal dissociative states (such as daydreaming) to abnormal dissociation (such as amnesia from incest)” (Hanson 2). Dissociation is also defined as a change in integrative functioning of consciousness, memory, and/or identity according to the Diagnostic Statistical Manual used by most professionals in the fields of mental health.

If many people dissociate to some extent everyday, how can Dissociative Disorders not be real? If trauma, violence, abuse, and apathy are prevalent in the world, how can a portion of the population not respond through dissociative behaviors to some degree? To what degree do individuals dissociate and has that degree of behavior increased in the last ten years?

This research study examines the norm of dissociative behaviors in the general population in 2001. Three research questions are addressed: (a) is dissociation becoming more prevalent in the general population; (b) do females dissociate more than males; and (c) does ethnicity affect the degree of dissociation? The results were compared to a normative study

conducted in Winnipeg, Canada in 1991 by Colin A. Ross, M.D., F.R.C.P.C., Shaun Joshi, and Raymond Currie, Ph.D. In addition, this 2001 study inspects the data for age, gender, and ethnic similarities and differences.

To gather information for this study, masters of the Dissociative Evaluation Scale Questionnaire (DES) were obtained from the Sidran Foundation. The scale was developed by Eve Bernstein Carlson, Ph.D, and Frank W. Putnam, M.D., The overall DES score is obtained by taking an average of twenty-eight items comprising the scale. The DES Questionnaire was determined to have high internal validity ALPHA=.92.

The data was collected from a normative population of college students. Two hundred and sixty subjects participated. The evaluation began with a reading of the consent form to each group. It was reiterated that there was no time limit and the test would take approximately thirty minutes to administer. The test was strictly voluntary. The consent forms were detached and turned in separately to insure anonymity. There was also no reward system.

The average age of the participants was twenty-two years old. There were one hundred and fifty female subjects (57.7%) and ninety-five male subjects (36.5%). Fifteen subjects (5.8%) did not disclose their gender. Sixty-four subjects self-described as minorities (Asian, African American, Native American, Hispanic/Latino) and accounted for 24.5% of the participants. Ten percent did not report their ethnicity, and the remaining participants were of European descent.

A comparison of the results of this 2001 study to the Ross 1991 study failed to support the hypothesis that there would be an increase in dissociative behaviors in the past ten years. The comparison z test results, $z = .15$, do not indicate a significant increase. The mean score of the participants in this study was 16.5 with a standard deviation of 12.84. The mean score of the participants in the comparative study was 10.8 with a standard deviation of 20.2. (Ross, Joshi, Currie 1991). However, given sample differences, this was not a strong test of the hypothesis.

The data suggest that men, on average, dissociate more than women. The data also suggest that minority men may dissociate more often than do men of non-Hispanic Caucasian heritage. Thirty-three or 13% of the participants reported having dissociative experiences over 30% of the time.

There are several reasons to continue research of dissociative experiences. Dissociation is subject to heated debate among mental health professionals. More data may lead to better diagnostic tools and treatment models. Dissociation is thought to be one way in which some individuals cope with stress, trauma, and violence. Establishing a norm for dissociative experiences may increase awareness of the ways some individuals respond to stressors, reduced social support, and expanding technologies characteristic of the ecology of the 21st century.

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Effects of the 1996 Welfare Reform Laws

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Summary

The main feature of the 1996 Welfare Reform Law is that it requires parents to work in order to receive benefits. Overall, the law seeks to reduce the number of children growing up in poor, single-parent families. Current literature regarding consistency of family income proposes that children suffer developmentally when family resources are drastically reduced (whether on or off welfare). These families have little to no resources to sustain themselves and frequently do without basic needs. This literature review addresses the following issues: (a) the Personal Responsibility and Work Opportunities Reconciliation Act of 1996 (PRWORA); (b) PRWORA provisions contained within Temporary Assistance for Needy Families (TANF); and (c) the benefits and drawbacks of the law as it impacts the lives of children. This research is critical because in September 2002, federal legislators plan to discuss renewal and/or changes of current reform laws. It is imperative that during future discussions of the 1996 Welfare Reform Law, the following concerns are considered: (a) the economic downturn after September 11, 2001; (b) the amount of job layoffs in 2001/2002 and projections for 2003; and (c) the job availability for laid off workers and head of households required to exit welfare to work. As changes are recommended, the well being of children must be deemed of utmost priority.

Personal Responsibility and Work Opportunities Reconciliation Act of 1996

The Personal Responsibility and Work Opportunities Reconciliation Act (PRWORA) of 1996 (Public Law 104-193) was enacted on August 22, 1996. This act replaced and condensed the following programs and their provisions: The Aid to Families with Dependent Children (AFDC), Job Opportunities and Basic Skills (JOBS), and the Emergency Assistance (EA) into PRWORA provisions contained within TANF. TANF is a state block grant program, which contains strong work requirements. Nearly all recipients must work after 2-years of assistance. States are required to have 40% of families working or off welfare roles by September 30, 2000, and 10% more off assistance by September 30, 2002. Parents must work no less than 30 hours per week for single parents and couples 35 hours per week. Work can be volunteer

work (community service), vocational training, or wage earning employment. Exceptions are parents with children under six years of age who cannot find adequate childcare, single parents with children less than one year of age, or persons utilizing an allowed period of six weeks of job search time. Families cannot spend more than five cumulative years on TANF. After the time limit is exceeded, states can elect to provide families non-cash assistance and vouchers using Social Services Block Grant or State Funds commonly referred to as Social Rehabilitation Services (SRS).

Further changes were implemented regarding the distribution of Cash and Food Stamp benefits. The Electronic Benefit Transfer (EBT) @ Vision Card System was introduced. Eligible recipients are issued a Vision Card; benefits (whether cash and/or food stamp) are distributed electronically each month to this card. This card receives a credit balance for one or both benefits. Cash benefits can be utilized for living expenses such as rent, utilities, and/or cash withdrawals. The Food Stamp benefits are restricted to the purchase of food (or garden seeds for growing food). This limitation was implemented to help insure the purchase of nutritious foods. EBT payments are accepted at most retail food stores. Meal coupons are accepted at non-profit facilities from persons who are homeless, blind, disabled, and/or suffering from drug addictions. This also includes residents of shelters for battered parents, children, and individuals aged 60 or older. Previously cash and food stamp benefits were issued in check and booklet form. Benefits were sent through the United States Postal Service and the recipients used benefits at will. Over a period of years the welfare system has been misused and abused by some recipients. The 1996 changes in benefit distribution helped to curb widespread abuse of the system.

Benefits of the Law

The law allows more liberal eligibility criteria for two-parent families. This component promotes marriage by not penalizing families with fathers in the household. Two-parent families must work 35 hours per week as a unit. Single and two-parent families also have opportunities to receive employment training, transitional benefits for parents leaving welfare for work such as financial assistance for quality childcare, extended health coverage and food stamps. These benefits supplement the parents' wages and help to support long-term employment and successful exits from the welfare system.

In addition, individual states must operate a child support enforcement program, meeting federal requirements in order to receive TANF block grants. Child support enforcement agencies make sure absent parents (fathers or mothers) contribute to the support of their children (Behrman, 2002). Families receive needed financial resources that provide opportunities for parents to invest in their children's education and to provide for their basic human

needs of shelter, food, clothing, and safety. Some families were able to transition from welfare to work and exit welfare roles. Many children of these families have shown positive improvement in their mental health and developmental growth.

D r a w b a c k s o f t h e L a w

Because of increased mandatory work requirements, single parents and their children may experience significant stress. Single-parents children spend more time in childcare facilities and less time together with their parents as a family unit. Sudden changes in parenting practices and home environment have resulted in mixed findings. The impact on children's mental and developmental growth between 0-5 years of age has shown more damaging effects than in older siblings. Many pre-kindergarten age children display signs of separation anxiety and exhibit angry and aggressive behaviors more frequently (Behrman, 2002).

Many families were not able to exit the welfare system prior to the September 11, 2001, tragedy. These families are currently under mandated provisions to secure employment by the September 2002. When parents fail to meet work requirements, prior to expiration of the five cumulative years on TANF, families plummet further and further into poverty's dark hole of despair. Restrictions enacted in 1996 under Supplemental Security Income (SSI) caused an estimate of 100,000 children to lose their eligibility in 1996 and another 70,000 between 1997-2000 (Yoshikawa & Seidman, 2001).

Many families' incomes shifted from welfare cash benefits to earned wages. This transition showed a reduction of families on the welfare roles, which gave the appearance of substantiated success of the reform laws. However, these families' financial earnings remain the same or did not increase enough to elevate their station in life above the poverty level (Yoshikawa & Seidman, 2001).

D i s c u s s i o n

The most important item on the welfare reform authorization agenda should be for Congress to keep full funding for TANF. States must be able to maintain and expand work programs put in place since the reforms. Over the past five years, these programs have helped about two million poor mothers join the labor force and, in many cases, bring themselves and their children above the poverty line.

Researchers recommend three changes to federal provisions: develop and conduct job retention and job advancement programs; create job programs for fathers of children on welfare; and design and fund programs to reduce non-marital births (Haskins, 2002). More studies are needed to monitor the full impact of welfare reforms on the well being of children.

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The Women's National Indian Association Impact on Native American Women During the Period of the late 19th Century Assimilation Policy

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Summary

This research investigates the Women's National Indian Association (WNIA) impact on Native American women during the period of the late 19th century assimilation policy. The WNIA, founded in 1879 by Mary Bonney, was a reform organization advocating Christianization and acculturation of American Indians. The Women's National Indian Association (WNIA) consisted of a group of Euro-American women who aspired to not only acculturate their Indian charges, both men and women, but also impart to them gendered notions of "civilization." The women of the WNIA often saw Native American women as child-like, existing within a "heathenistic" culture that needed to be properly cleansed and replaced by the "superior" American culture. The WNIA solution to the dilemma was to incorporate Native American women into their Euro-American culture through acculturation, education, and citizenship. This research investigates why the WNIA was formed, the mission of the WNIA, and how the WNIA changed Native American women's lives in multiple ways.

The missionaries who formed the WNIA adopted the Euro-American nineteenth century ideology of "true womanhood" (Ryan, 1981). According to this ideology, woman's nature was pious, pure, submissive, and nurturing; women were to be the keepers of virtue and guardians of morality (Wanken, 1981). Through the role of wife and mother, a woman was portrayed as a noble person to her husband and children. During this time, the home was considered the main source of civilization. With the rise of industrial capitalism in the early nineteenth century, the home functioned as a private place for women to retreat from the business world and as a place to keep women in their "proper" position in society. Believing their ideology was superior, particularly in the ways women should behave, the WNIA sought to extend their moral influence beyond their homes and into the lives of Native American women.

So concerned about the lifestyle of the Native American women, the missionaries of the WNIA attempted to secure laws they deemed necessary for the acculturation process. They worked to establish laws for Native Americans to become citizens, to gain land, and to receive education. The WNIA was also involved in sending and supporting suitable missionaries and instructors to reside among Native Americans to teach them how to speak English and to teach them "proper" gender roles and Christian behavior. In addition, the

WNIA circulated literature, opened libraries, built schools and hospitals, dispensed temperance literature, sent barrels of food, clothing and various items to the tribes, underwrote the education of numerous Native American students, and lent money to build homes. The Native American women were instructed in behavior, gender roles, education, citizenship, and child rearing. The missionaries instructed the women to rear their children in the ways of the Euro-American in order to "de-Indianize" them.

In the process of acculturation, some of the Native American women became mediators of two worlds (Euro-American and Indian). Although the Native American women were caught in the middle of two cultures, many used the education from acculturation for personal gain as well as to help their nations maintain some type of autonomy. For some Native American women significant problems arose. For example, some were disconnected because they were not accepted in the white man's world and lost their ability to communicate with their own tribe. However, other women such as Susan La Flesche Picotte were able to use their education for great advantage (Wanken, 1981). Through education funding from the WNIA, Picotte became a doctor and successfully mediated between her tribe and the white man's world. In addition, Native American women used their education to lead their people to resist extinction. Armed with knowledge of Euro-American ways and values, these women (Susan La Flesche Picotte, Zitkala-Sa, and Mary Crow Dog) became central figures in reform and resistance movements (Wanken, 1981). Despite the WNIA's attempts to complete the acculturation process, many Native American women established and maintained their voices and empowered themselves to work for their tribes and culture.

In conclusion, American missionaries formed the WNIA in the late 19th century for purposes of shaping Native American lives into the Euro-American culture. In the process of acculturation, the mission of the WNIA was to educate Native Americans in gender roles, citizenship, industrial training, child rearing, and homemaking skills, etc. Believing their culture was superior, the missionaries held minimal respect or understanding for the Native American culture and tradition. Although many varied problems arose for the Native American woman in particular, some of the women were able to use their education and training for their personal gain as well as for the benefit of their tribes. Despite the many attempts of complete acculturation and perhaps eradication, the Native American culture, spirituality, and tradition still remains.

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Misrepresentation of Muslims, Middle Easterners, and Arabs through the Media

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Summary

Along with other ethnicities and groups of people, Muslims, Middle Easterners, and Arabs have been victims of distortion or misrepresentation by the United States media long before the tragic events of September 11th. Since television is a predominant source and distributor of popular culture, this research investigated ways television distorts, twists, and misrepresents identities of Muslims, Middle Easterners, and Arabs. In addition to stereotypes and distortion, these groups are often grouped together as one entity. While identifying characteristics of these groups separately, this research explains varying stereotypes and discusses the effect that television has on the average citizen. To conduct the research, various movies and commercials on television were observed, and stereotypes were documented. In addition, a live conference was attended and information and ideas presented in the conference were compared to media coverage. The results of this research were alarming and suggest that the media has the ability to distort and misrepresent any group according to its interests at the time.

Since mainstream media seems to lump Muslims, Arabs, and Middle Easterners as one group, the characteristics of each are explained and described in detail in this paper. Muslims are believers of Islam. Many Middle Easterners and Arabs are Muslim; therefore, Islam plays a very important part in the identities of these groups. Islam is the name of the world's second largest religion (Cornell, 2002). Although Islam began in Arabia, Muslims live in every country in the world. Only about 15% of Muslims are Arabs and there are six million Muslims living in the United States out of 1.2 billion in the world (Cornell, 2002).

Arabs are a large group of people whose native language is Arabic. Approximately 90% of Arabs are Muslims (Donner, 2002). The term Arab refers to the 265 million people who reside in the 22 Arab states as well as the many more million Arabs who reside around the world.

Middle Easterners are descendants of several different cultural backgrounds. Middle Easterners are the people from the countries of Southwest Asia and North Africa, which includes the countries extending from Libya on the West to Afghanistan on the East (Le Gall, 2002). Ethnically, more than three fourths of Middle Eastern people are Arabs. Although from different countries, Arabs share a common culture and Arabic language. Iranians, who are Persian

and speak Farsi, form a major ethnic group. Also, Turks who speak Turkish are among the major ethnic groups in the region as well.

The media, a powerful source of information, has distorted these groups of individuals by using several stereotypes and by leaving out major details when delivering news. Since 98% of all households in the United States have at least one TV set, television tends to be a major influence on most Americans today (Shaheen, 1984). To investigate existing stereotypes, several movies and commercials on television were observed and a pertinent conference was attended. Although many movies shown on television were observed, for brevity, only a few are mentioned in this summary.

It should be noted that one of Disney's most successful movies, *Aladdin* (1992), depicts Arabs and Middle Easterners as barbaric. For example, although part of the original lyrics to the theme song of the movie were changed because of anti-Arab or anti-Middle Eastern content, the lyrics continue to suggest that Arabs or Middle Easterners are cold-blooded, barbaric, and/or camel riders.

Another common stereotype is the portrayal of Arabs, Muslims, and Middle Easterners as potential terrorists. Although terrorists may come from any and all ethnicities and religions, Arabs, Middle Easterners, and Muslims are overrepresented as terrorists in the media. For example, in the movie *The Siege* (1998), Arabs, Middle Easterners and Muslims were grouped together as one and connected to terrorism. Violence was linked to religion and bombing to prayers. Other movies in which Arabs, Middle Easterners, and Muslims are portrayed as terrorists are *Rules of Engagement* (2000) and *Executive Decision* (1996). These are just a few of the many examples in which the media portrays an unbalanced connection of terrorism with Arab, Middle Easterners, and Muslims.

Furthermore, in the movie *Father of the Bride* (1995), a stereotype of women having no voice or power in male-female relationships was perpetuated. For example, in a particular scene in which a Middle Eastern husband and wife attempt to buy a new home (the only time non-whites are included in the movie), the husband shouts at his wife to stay quiet for the duration of the scene, while the husband makes the final decision.

To gather further information for this study, detailed notes were taken at a conference on world peace held by the Minister Louis Farrakhan. These notes were then compared to live media coverage. The results of the comparison suggest that the media has the ability to distort and misrepresent by either leaving out details or not recording them properly. For example, regarding the conference, an individual in the news media reported, "I never hear him say a good thing about America." In contrast, Farrakhan clearly communicated at the conference how blessed this nation is. It was evident that the purpose of the conference was to discuss the need for America to unite; for individuals to educate

themselves on foreign policy; and for individuals to examine other countries perceptions of the United States. The media failed to deliver accurate information in this situation.

In this study, stereotypes of Arabs, Muslims, and Middle Easterners were observed on television through commercials, movies, and news reports. In this investigation, it became obvious that different groups were either lumped together as one group or misrepresented as a whole. Additionally, in the observed movies, Arabs, Muslims, and Middle Easterners were typically portrayed as barbaric and/or as cold-blooded terrorists, and the stereotype of the Middle Eastern woman as a voiceless puppet was propagated. Observations in this study provide evidence that the television and movie media instigate and maintain stereotypes and distort images of specific individuals.

Finally, because citizens of the United States rely on the news media to receive factual information, the media's coverage of the news is critical. We depend on the media to deliver honestly what is going on around us. Since misrepresentation has been identified throughout different forms of the media, the media should be called into question. As conscientious citizens, we should continually ask ourselves if we have the true facts and if subtle (or not so subtle) untruths are perpetuated by what we see in films and on television, etc. In these troubled times, we need to keep open minds, to listen to varying viewpoints, and to reevaluate the accuracy of our sources of information.

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The Relationship Between Serotonin Manipulation In the Brain and the Manifestations of PMS

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Summary

Man has once again learned to manipulate Mother Nature through the use of Selective Serotonin Reuptake Inhibitors (SSRI) for relief of the symptoms of Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Dysfunction. These mood disorders are one of today's controversial pharmacological subjects. Eighty-five percent of women across cultural lines claim to experience PMS (Monson, 2002), while 10% of women experience the more severe form of PMS, known as PMDD, (Spartos, 2000). This literature review investigates how Selective Serotonin Reuptake Inhibitors work to alleviate the symptoms of PMS and PMDD. This review also investigates possible side effects, as well as whether these treatments permanently cause brain damage by cutting off the axons of the nerves they target, forever chemically altering the brain.

Neurotransmitters

Serotonin is an inhibitory neurotransmitter that works to calm the central nervous system. Neurons are found throughout the body, but are most highly concentrated in the brain. A neuron differs from other cells in that it has tiny processes extending from it called dendrites. Dendrites receive messages from all over the body. At the opposite end of every neuron there is a sending mechanism called an axon. The messages relayed between the axons and the dendrites are called neurotransmitters, one of which is serotonin. These neurotransmitters are chemical in nature, and are released by axons to the dendrites, sending nerve impulses to not only the brain but to everywhere in the body.

Symptoms

The symptoms of PMS and PMDD are both physiological and psychological. The physiological symptoms include bloated stomach, swollen feet or hands, tender enlarged breasts, crampy lower abdomen pain, weight gain, headache, nausea, vomiting, diarrhea, constipation, appetite changes, and joint and muscle pain. The psychological symptoms include irritability, anger, depression, anxiety, tension, fatigue, lack of energy, difficulty concentrating, crying spells, feeling overwhelmed, feeling out of control, and a lack of or decrease in sex drive. To have PMS a

woman may have one or more symptoms. To be diagnosed with PMDD, she must have at least five symptoms, one of which must be a depressed mood, noticeable anxiety or tension, sudden sadness or tearfulness or persistent irritability or anger (New Treatment Approved for Severe Premenstrual Symptoms, 2000). The criterion for diagnosis of PMDD is that the symptoms must occur during the post-luteal phase (two weeks before a woman's period) of the menstrual cycle. The symptoms usually disappear once she begins menstruating. Diagnosis must be given by a doctor, and this diagnosis includes requiring a woman to keep a daily diary of mood swings for two consecutive months (PMS and PMDD, 2001).

In addition to being physiological and psychological, the symptoms of PMS and PMDD are both cyclical and chronic. The cyclical symptoms will manifest themselves anywhere from a couple of days each month for some women up to 21 out of 28 days every month for other women. The chronic symptoms that manifest themselves at menses are likely to flair during and after pregnancy, during particularly stressful times, with certain medications, and again at menopause (Monson, 2000).

Selective Serotonin Reuptake Inhibitors (SSRI)

The Selective Serotonin Reuptake Inhibitors which are currently used to treat the symptoms of PMS and PMDD include Prozac, or Sarafem, Zoloft, Paxil and Celexa. These medications work on the symptoms of PMS/PMDD by blocking the reuptake of serotonin. Initially, a neuron undergoes chemical reactions causing a nerve impulse called the action potential. That impulse, or action potential travels down the axon to its end, called the terminal or bulb. When the nerve impulse reaches the axon ending, it stimulates the release of the neurotransmitters, including serotonin, into and across the synaptic cleft toward its specific receptor waiting in the dendrite of the receiving cell. Here it stimulates another nerve impulse or action potential. Once the neurotransmitter in the post-synaptic cell has caused the next impulse, it is released back into the synaptic cleft, where it would normally be reabsorbed back into the pre-synaptic cell, in a recycling process. That reabsorption is the potential reuptake process. However, the SSRI's have bonded with the serotonin transporters, thereby blocking the reuptake process. This means that there is a surplus of serotonin in the synaptic cleft which causes the action potential or neural impulse of the post-synaptic neuron to remain on for greater periods of time, thus delivering many more tiny jolts of stimulation than if the neurotransmitters were allowed their normal reabsorption process.

Serotonin Receptors

Very little is known about serotonin and its receptors; however, in animals serotonin has proven to reduce aggression (Fuller, 1991). Neuropharmacologists have identified seven serotonin receptors to date, but of the seven, only the functions of two are understood. The 5HT1A receptor seems to mediate anxiety and depression and the 5HT3 receptors may be useful in treating schizophrenia (Cravchik, MD, Goldman, MD, 2000).

Side Effects of SSRI's

The side effects of SSRI's include nausea, tiredness, nervousness, sweating and tremors, difficulty sleeping, sexual dysfunction, suicidal ideation and an eventual drug tolerance (Henney, 2000). Suicidal ideation is not recognized by the manufacturers as a side effect and only occurs in some people (Thompson, 1994). There are numerous reports that the Eli Lilly Company, makers of Prozac, recently renamed Sarafem, has been plagued by lawsuits. This is not unusual for drug companies; however, it bears mention that in May of 1990 Lilly warned doctors that Prozac's side effects could also include suicidal ideation. One year later Lilly began offering doctors indemnification against any lawsuits if they would continue to prescribe Prozac (Cockburn, 1992). It is interesting to note that in some high profile murder cases, the legal system found the ingestion of Prozac to be a sound legal defense.

Conclusion

In conclusion, evidence points to the fact SSRI's do help relieve the symptoms of PMS and PMDD. However, research also shows that over time a drug tolerance will develop, thus requiring higher dosages for relief. Some individuals may experience psychotic reactions that could prove severe. But the real question is at what price do we fool Mother Nature? What are the consequences of tricking the body into producing surpluses of serotonin and overworking the neurons? Joseph Glenmullen suggests in his book, *Prozac Backlash*, that there is a distinct risk of overworking the axons, burning them out prematurely, forever chemically altering the brain.

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Using Virtual Reality to Model Manufacturing Processes

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Summary

From its conception, virtual reality technology applications have come a long way and are largely varied. Its users and developers include the industries of entertainment, sports, medicine, and manufacturing. Virtual reality (VR) is described by Howard Rheingold as "an experience in which a person is surrounded by a three dimensional computer generated representation and is able to move around in the virtual world and see it from different angles, to reach into it, grab it, and reshape it." (Patil, 2002). This paper discusses the multifaceted advantages of applying VR technology to the manufacturing setting.

VR technology is being developed by a combined group of local Wichita aircraft leaders and WSU scholars for its application to the manufacturing setting. The goal of the project is to model the manufacturing process of a Boeing 70G Strut Torque Box line with real life situations using virtual reality software (DELMIA) and to use this virtual simulation to test different solutions to the production line. Additionally, Boeing will train their employees with the VR model. The second goal of the project is to integrate these models with the undergraduate Industrial Engineering curriculum so that students can have a more effective learning experience by applying their engineering skills to real life problems. More specifically, this paper will cover four relevant points: (a) the importance of VR in the manufacturing setting, (b) the process of modeling real life manufacturing processes in VR; (c) the importance of realism in VR, and (d) the role of People Putty software in the project.

A virtual model of a manufacturing plant is being developed because of the many advantages that these kinds of models provide. Although at the moment it is a costly technology, the advantages of such technology will soon outweigh the costs. All the information about the plant such as workers, machines, layout, capacities, etc. can be used in many combinations to test out ideas and decisions ahead of time, without having to make or spend actual resources and materials to do this (Yaman, 1999). If this information is more readily accessible, informed decisions could be made faster. Proposed project presentations to managers will be greatly eased with clearer visual

representation. Process and product development can be made simultaneously. In addition, there exists the advantage of training new workers in a virtual environment as opposed to on the job training. A factory would greatly benefit from having virtual reality as a tool, especially since "the general goal of VR-based user interfaces is the increase in the efficiency of the solution to complex and / or abstract problems to be solved" (Riedel, 1997,p5).

Modeling of the manufacturing systems can be organized in two different categories, the responsibilities of WSU and Boeing, since this is collaboration between the two organizations. WSU will be developing the information system for the VR model, and WSU will provide that information to Boeing. The responsibilities of the WSU team include developing the VR software and gathering the necessary information to make the model a complete and useful tool for Boeing and Industrial Engineering students. Also, they are gathering information regarding the current and past uses of VR as an educational and training tool, in addition to its use in the manufacturing industry. Boeing's part in the project is that of an investor in the VR software development, and then a provider of information that the WSU team requires to produce the model.

Another important part of the project is the integration of different software to make the final virtual environment. The objects in VR are created in CAD as drawings and solid models. Then, the manufacturing processes of the Strut Box production line are modeled in a simulation software called Quest. Detailed models of cells are developed in IGRIP. IGRIP and Quest are Delmia products.

One of the most significant considerations in this project is the amount of detail necessary to make the VR model seem real. In order for this to be an effective tool for Boeing and WSU, the model must be believable as the representation of the real life Boeing production line. Also, for the users to have a practical experience in the virtual environment, there must be a certain level of realism to the model. However, the problem is ascertaining how much time and effort should be made to make the VR model as real as possible, because this undoubtedly entails expenditure of time. There must be a certain level of realism that should be achieved so that the VR model is realistic, yet functional.

In an effort to make the VR model as realistic as possible, the people involved in the production line, such as managers and laborers, will be incorporated in the model. In this software, pictures of people can be utilized to make a three-dimensional model of their faces. Other features of this software can take voice recordings and make the 3D model appear to be talking.

This will be used to develop a part of the model where students can interview the workers in virtual reality to gather information necessary for their class projects, in order to create a simulated real life experience. It can also be used in the training of Boeing workers.

In conclusion, the modeling of the manufacturing process in VR has many advantages as a tool for Boeing and WSU. People need to feel immersed in the virtual environment and, to a certain extent, the realism of a VR model is significant.

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Creating Dialogue with African-American Adolescents to Examine the Risk and Protective Factors Related to HIV Infection and Substance Use

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Summary

African Americans are disproportionately affected by the HIV/AIDS epidemic, representing half of newly reported AIDS cases, yet representing only 12% of the United States population (Kaiser Family Foundation, 2001). African American adolescents are five times more likely to be diagnosed with AIDS than Caucasian adolescents (Wigwood & DiClement, 1992). This qualitative study examined the risk and protective factors related to HIV infection and substance use among African American adolescents between the ages of 13-19.

For purposes of this study, focus groups were formed from 164 students who participated in a HIV/AIDS and substance abuse prevention/intervention program. Of the 164 participants, twenty students were randomly selected to participate in the focus groups. Participants were stratified by age and gender. The focus groups were held on Saturday and for approximately an hour and a half. Participants were asked eight questions (see Table 1) related to substance use and HIV infection among African American adolescents. Participants' responses were videotaped and tape-recorded for an accurate record of answers and responses. Information drawn from the focus groups revealed several factors: (a) adolescents need communication with parents without judgment; (b) parents should spend more quality time with their children; (c) adolescents need to be taught strategies to help them cope with stress; and (d) interactions with a healthy peer group should be maintained.

Various conclusions may be drawn from this study regarding risks and protective factors related to HIV infection and substance use among African American adolescents. First, parent involvement in the lives of adolescents is tremendously important. Parent involvement is the foundation in helping adolescents to make wise

and healthy decisions about drug use and unprotected sex. Second, adolescents in the focus groups emphasized that they wanted their parents to listen and not judge when they consulted with them about drugs and sex. Third, adolescents described the role stress has in their lives, indicating that they lacked the proper skills to deal with stress in a responsible manner. Fourth, the adolescents mentioned that celebrities and music videos often play a major role in influencing their outlook on how life may be lived. Significant concerns arise as celebrities become role models, and many adolescents may not have the knowledge or maturity to realize that the celebrity life is very rare and in most cases unattainable. Finally, it must be recognized that focus groups provide adolescents an opportunity to respond to questions in an open and honest atmosphere in which their voices may be heard without judgment. Focus groups may help researchers to probe further and to ask more in-depth questions rather than limiting the research to questions on a survey.

Limitations are noted in this study in that not all of the students who participated in the larger research study were selected to participate in the actual group study. Thus, the results may not be an accurate reflection of risk and protective factors regarding drug and sexual activity of all African American adolescents living in Wichita.

Utilizing adolescent focus groups to enhance communication is beneficial in further understanding the needs of African American adolescents. An additional step to be taken is to bring parents into the communication process. Forming parent and adolescent focus groups would be beneficial as well. In paired focus groups (parents in one group and their adolescent children in another group), parents and adolescents may share their concerns and needs in an open and honest atmosphere. Then, bringing the focus groups together to discuss issues in a non-threatening way may enable the lines of communication to open between parents and adolescents. This communication may help parents to better understand what their child is experiencing at home and in his or her life outside the home. Communication through focus groups may aid parents and adolescents in empathizing with the life experiences of one another. If parents could better understand what their children truly need, perhaps parents could adequately support their children in maintaining a healthier lifestyle. Further research is warranted.

Table 1

<ol style="list-style-type: none"> 1. What are some of the reasons African Americans youth use drugs? 2. What are some of the reasons African American youth have sex in their teen years? 3. What are some of the reasons African American youth avoid drugs? 4. What are the things that might help African American youth avoid having unprotected sex? 5. If you could design a program, what would you include to lower the chances of a friend using drugs or having sex too soon or without protection? 6. What would you do to solve the drug abuse problem in this community? 7. What would you do to solve the problem of African American youth having unprotected sex and getting sexually transmitted disease and HIV? 8. How would you have improved the Risk Reduction project? What are some things we could do to make it better?
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