

The Graduate Formula:

Hard Work + Persistence

= Success



McNAIR SCHOLARS PROGRAM

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WICHITA STATE
UNIVERSITY

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I am proud to present volume 12 of the *Journal of Research Reports*, “*The Graduate Formula: Hard Work + Persistence = Success.*” The articles featured in this journal represent the work of the Program participants from the 2006-2007-grant year. As one reads through these articles, it is clear that the breadth of research interests is as diverse as the students that we serve and the quality is outstanding as well. My staff and I could not be more pleased with the efforts that went into producing this meaningful and scholarly body of works.

The Program could not achieve such great accomplishments without the support of the University faculty, staff and administrators who have mentored students over the past 12 years. These mentors have not only guided the McNair Scholars in completing their research manuscripts, but they 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 this Program.

As we bring this 4-year grant cycle to a close and begin a fourth cycle, we send our gratitude to the University Administration and the U.S. Department of Education for their support over these past 12 years. We look forward to continuing our relationship for many years to come.

Within this journal we showcase the works of thirteen students from the campus of Wichita State University. There are five full papers and eight summaries presented.

A special word of thanks is directed to our research coordinator, **Mr. John Tucker**. His dedication and support for the students was immeasurable. Appreciation is also given to our program counselor, **Ms. Shukura Bakari-Cozart**, and the senior administrative assistant, **Ms. Sheri Daniel-Washington** who without their support and persistence in making sure that things get done in a timely manner, none of this would be possible year after year. These individuals are invaluable and irreplaceable. Dedication and commitment are rare qualities, and I feel fortunate to have found staff members who hold these qualities in such reverence.

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 they can be proud of for many years to come. We are most proud of our students and their accomplishments. This is a well-deserved acknowledgement for their hard work. These students are our future educators and the epitome of “Academic Excellence.” Thank you for the opportunity to work with you, such fine students.

LaWanda Holt-Fields, *Director*



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Haptic Touch and Visual Sensation in a Three Dimensional World

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McNair Scholar

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Abstract

Psychologists believe that human knowledge of the surroundings is received through the five senses – touch, sight, smell, sound and taste. Since each of the senses is processed in separate areas of the brain, it is believed that each sense generates its own modality-specific perceptual representation. This topic has recently been the subject of debate because new research has revealed complex interactions between the senses in the brain. Based on a study that found blind people capable of drawing in three dimensions (3-D) without ever having a three-dimensional visual experience in their life; some scientists speculate that visual experience is not required for accurate spatial perception. Still, other research indicates that those having some visual experience are better able to interpret the three-dimensional world because they possess 3-D representations based on visual experience.

The research discussed in this paper attempts to examine the inter-dependence between visual and tactile experience in humans. This research is likely to determine that people with more visual experience perform different on a tactile activity than those without the visual experience. Five sighted blindfolded participants and two blind participants were asked to arrange pushpins in a five by five grid on a foam board. Results support the hypothesis; the sighted subjects performed significantly different than the blind subjects.

Introduction

How humans gain knowledge of the world we live in has been debated since the beginning of philosophical thought. Such questions fall under the heading of epistemology, and philosophers and psychologists have differed regarding whether knowledge is innate, or whether ideas of the physical world come about via sensory



experience. The former perspective is known as rationalism, and the latter represents the empiricist standpoint. Modern psychology universally accepts that humans perceive the world through the five senses of vision, touch, hearing, taste and smell. While it is obvious that each of these sensations occur through a particular organ or set of organs, how the brain organizes and integrates these disparate sensations into a unified perception of the external world is less clear. It is also unclear if one system can affect another. For example, the statement "vision is to light as haptics is to resistance," (Kennedy, 2006, p. 509) emphasizes the different physical basis of the sensory systems. Kennedy (2006) has further stated that the sensations are so different that there must be no connection between them at all. The implication is that they remain distinct, even at higher levels of neural processing. (p. 509)

Vision and touch have received a lot of attention among the scientific community, with the latter being generally called haptics, which emphasizes active manual exploration of the world. Vision is based solely on light that reflects off objects and enters into the eye. These light rays pass through the cornea and lens, focusing the image onto the retina at the back of the eye. There, special neural cells called rods and cones respond to the presence of light, triggering a signal that transmits the retinal image to the occipital lobe of the brain via the optic nerve, where the visual cortex begins processing the image. Recognition of patterns in the image is thought to occur via projections from visual cortex to the temporal lobe of the brain. Conversely, touch is based on pressure detected by neurons in the skin. Those neurons relay their activity up to the spinal cord via the dorsal roots and into the brain. These sensations are received by the somatosensory cortex, thalamus, and the brainstem depending on where on the body the sensation occurred. Each of these parts processes sensations from different areas, depending on where the sensations came from, and how many neurons are at the site of the sensation. It is important to note the differences in the process of perceiving touch and vision.

These same sensations provide humans with knowledge of where the body is in space, which is called proprioception. We can also perceive the movement of our body, which is called kinesthesia. Further, via the so-called proprioceptive-exteroceptive linkage, we can hypothetically perceive the shapes and sizes of objects that we touch by perceiving the shape and scale of the paths traversed by our hands as we touch and explore these objects. This perceptual ability to perceive objects' properties by active touch is called haptics. There is still much unknown about the specific process of proprioception. Popular opinion holds that it not only uses the pressure receptors in the skin and other tissues, but other sensory modalities such as vision. Gibson (1979) coined the term visual kinesthesia to describe the ability to perceive visually one's own body movements. An experiment by Serino, A., Farné, A., Rinaldesi, M., Haggard, P. and Ládavas, E. (2007) showed that when subjects lacking in somatosensation (the ability to control one's limbs) due to sensory polyneuropathy were able to view their limbs, they had less error when performing a pointing task. Theories of proprioception explain why some believe that the process of touch is deeply linked somehow to the process of vision. Brescianai, J., Dammeier, F., Ernst, M., (2006) attempted to determine if there was any effect of vision when biased with touch sensations, and visa versa. They first asked subjects to count a number of flashes of light while being told to ignore the taps they were also receiving. In some trials, the taps were synchronized with the flashes, and in other trials they were not. In a second condition, the subjects were asked to count the taps while ignoring the flashes of light. Again, sometimes the flashes and taps were synchronized, and sometimes they were not. Researchers determined that when the flashes and taps were synchronized, subjects were better able to perform the task (Bresciani et al. 2006). Conversely, when the flashes and taps were not linked, the subjects' performance was significantly lower; this shows that one sensation biased the other.

Another part of the argument that there is a deep connection between sight and haptics is



based on research with illusions. For example, consider the visual vertical-horizontal (V-H) illusion. In this illusion, the subject sees a vertical line and a horizontal line of the same length, usually configured as an L-shape or inverted T-shape, oriented in the vertical fronto-parallel plane. When asked which is longer, the subject reports that the vertical line is longer. A similar illusion in haptics is called the radial-tangential illusion. This illusion happens when a subject is asked to feel L- or inverted T-shapes oriented in the horizontal plane. In this orientation, what would be the vertical line is now oriented radially to the body, and the previously horizontal line is oriented tangentially to the body. A similar perceptual effect occurs; even though the lines may be of equal length, subjects report that the radial line feels longer than the tangential line. Some researchers believe that these two illusions are similar because they occur due to a similar malfunction in the brain. The underlying idea is that the illusion occurs at a high level of neural processing common to both the visual and haptic systems. However, there are others who believe these two illusions arise due to the sensory anatomy, and are thus different because the sensory systems are different. One paper by Heller, M., Bracket, D., Salik, S., Scroggs, E. and Green, S., (2003) explains that these two illusions are different because the tactile illusions deal specifically with the movement of the arm and not the particular direction. When the arm is moved radially, the shoulder must rotate while the arm is extending. However, when the arm is moved tangentially, the arm only extends, and there is no shoulder movement. Because the latter movement requires the use of more muscles and tendons, a slight overestimation of the distance moved occurs (Heller et al., 2003). Likewise, the visual V-H illusion is thought to depend on the structure of the retina, and is thus specific to the visual anatomy (Avery & Day, 1969).

The existence of a link between vision and haptic sensation would also indicate a link in how these two senses develop. If there is a link, then developing these two senses together ought to result in certain inter-sensory interactions that would otherwise not exist. A study (Kupers

et. al. 2006) compared a tactile test performed by four subject groups; early onset blind, late onset blind, low vision, and sighted blindfolded subjects. Each group was taught to respond to stimuli using their tongue instead of the fingers to allow no previous experience between subjects. This allowed the results to be purely based on when the subjects lost sight, or if they had none at all. PET scans were then taken of the subjects while they were performing the tasks, to indicate where the perceptions were being analyzed. The subjects were then stimulated in the occipital cortex without the tongue stimulation. Researchers discovered that subjects with early-onset blindness had a feeling in the tongue elicited by the stimulation in the brain. Conversely, subjects who had visual experience (late-onset blind, sighted-blindfolded subjects) did not receive the tactile event after the stimulation. This indicates that the early-onset blind people were able to change the function of the occipital lobe. The same effect may not have been seen in the other subjects, including the late-onset blind subjects, because they had many years of co-development between the visual and haptic processes. The subjects with early-onset blindness developed the haptic sensations independently, which allowed them to re-wire their systems to utilize the occipital lobe, which might not otherwise have been of use. Those who had more visual experience were unable to change how they perceived the sensation.

Based on this experiment, one may surmise that subjects who do have visual experience do not have an advantage in tactile exercises. In fact, the subjects with no co-development of the senses were better able to perform the tasks. If visual experience does not factor into performing tactile events, then any blind subject should be able to perform similar tactile tasks as well as or better than a sighted subject. These results support the reason that many believe that haptic experience actually has a stronger effect on tactile activities than visual experience. This claim is also supported in many cases where blind people are able to draw in three dimensions. Without any prior knowledge of what a two-dimensional representation of a three-dimensional object



would look like, they are able to produce drawings of a three-dimensional object. (Heller, 2006; Kennedy & Lederman, 1982) This illustrates that it is possible to understand visual concepts without ever seeing them.

The current research is designed to determine if there is any validity to the idea that the visual and haptic systems co-develop. If so, we hypothesize that the blind subjects will perform differently than the blindfolded, sighted subjects. The long term benefits of this research will aid in the understanding of how the world of touch is perceived, by both blind and sighted persons, and to further improve the design of tactile displays for blind persons, including improved tactile graphics and methods of teaching tactile skills for reading Braille.

Method

Participants

There were a total of seven subjects (mean age was 22.8 with two males and five females). The five, sighted participants were students at Wichita State University; they either volunteered for the study or received partial psychology course credit in exchange for their participation. The two blind participants were associated with either the Wichita chapter of the National Federation of the Blind or the Wichita Association for the Visually Handicapped. Their participation was completely voluntary. All participants were right-handed and had neither motor nor non-visual sensory disabilities.

The sighted participants had normal or corrected-to-normal (with contact lenses or eyeglasses) vision. The visually impaired participants both suffered nearly complete visual loss, although one reported slight light sensitivity. Both participants lost visual abilities early in life and reported not recalling any meaningful visual experiences.

Materials

This study included the use of a foam backboard featuring a 25 X 25 inch grid. The board was covered with a white paper used for recording the participants' responses. The subjects used push-pins to puncture the board,

and a marker to denote the locations of the punctures on the white paper after each session.

Procedure

Participants were first asked to complete a survey to collect demographic information, as well as sign a consent form. The sighted subjects were then blindfolded and seated in a chair in front of the foam board. Subjects were given two anchor points to guide them to the correct dimensions of the grid before they began. The two anchor points were in two opposing corners of the grid. Subjects were first instructed to arrange the pushpins in an L shape, with five pins going up and five across (including the anchors in both). They were instructed that the pins must be equidistant and that they could only use their right hand. Subjects were given a time limit for each task to assure that the total time would take approximately 60 minutes. The first and last tasks were allocated 15 minutes and the second task was given 30 minutes. The subjects alerted the experimenter when they were finished with the task. Subjects were offered a break when needed. The second task was to create a square grid containing 25 pins; there were to be five rows and five columns, with pushpins being equidistant, resulting in a 5x5 grid. Again, subjects were instructed to use only one hand and were given two anchor points. The third task was to create another L shape, a mirror image of the first one. Again, they were given two anchor points and 15 minutes. The order of the L shape tasks (normal versus reversed) was counterbalanced across participants.

Between each task, the pins were removed and marked with a different color. Each of the points made by the subject was then measured. Measurements were taken both of vertical and horizontal distances relative to the prescribed point. The distance between the prescribed and actual point was considered the degree of error in placing that pin.

Results

Error was calculated in reference to the mean location of each row and each column of the grid. In this way, we calculated the mean horizontal (left-to-right) position of each column, and



the mean vertical (front-to-back) position of each row. A two-way, repeated-measures, split-plot ANOVA was performed on mean error measures across the workspace (column vs. row) and between the groups (sighted vs. blind). There was no main effect of column vs. row, indicating that the mean spacing of the rows and columns was not different across groups. Any such difference would have indicated the existence of a radial-tangential illusion. This lack of effect is thus inconsistent with the literature on haptic illusions. There was, however, a significant difference between the blind and sighted subjects' total errors, $F(1, 49) = 0.17$, $p < .05$. Sighted subjects exhibited less error than the blind subjects. The two-way interaction between group and workspace location was not significant.

Discussion

Previous research has not been able to determine with certainty if there is a significant connection between sight and touch. In this research the only data analyzed was the data gained from the second task, the grid. The grid provided information regarding the RT-illusion that may have existed, while also informing us if there is a difference between those who have had co-development of sight and touch in this tactile task and those who have not. After analyzing the error of the sighted subjects, we found that there was no significant difference between the errors in either the columns or rows. This indicates that there was no radial tangential illusion in this task. This could be due to the fact that there were two anchor points leading the subjects. It could also be due to the fact that the grid was not specifically an L or T shaped figure, as in previous research.

The two-way ANOVA that compared the blind subjects' error to the sighted, both in the row and columns, revealed a significant difference. This indicates that the co-development of the two senses leads to patterns of tactile sensing that differ from those without such co-development. This result confirms the notion that visual and haptic perceptions are integrated into a single perception at high levels of neural processing.

There are several implications of these findings for tactile graphics, which are a means of providing

graphical images to blind persons in a manner that can be felt. If congenitally blind persons possess some form of haptic distortion, then tactile displays ought to be designed with such distortions in mind. Understanding the pattern of the distortion allows the makers of tactile graphics to ensure their displays are legible. Further, these results imply that the pattern of distortion may differ depending on one's visual experience. Those with significant visual experience before the onset of visual impairment may require a differently designed tactile graphic than those without such visual experience.

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Cultural and Social Factors Influencing School Involvement of African American Parents

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Abstract

Parent involvement has become a major focus of education policy and reform. It has been found to increase student achievement, which in turn translates into greater educational attainment and wealth earning potential. However, studies focused on the involvement of African American parents have proven inconclusive. Cultural and social factors that may influence involvement are often overlooked. This literature review explores the history of African American parent involvement and its influences on the present. It also looks into how the unequal distribution of valued social and cultural capital along with teacher/parent perceptions can act as barriers to parent involvement.

Introduction

One major focus of education policy and reform is the achievement gap between African American and white students. The gap is evident from approximately the fourth grade and increases up through graduate school, translating into both lower enrollment rates of African Americans in graduate programs and lower wealth earning potential (Garibaldi, 1997). Research has suggested that increasing parent involvement may increase the achievement of all students, especially African Americans. However, studies concerning African American parent involvement have proven inconclusive. Disparities exist regarding what types of involvement are best for any particular population, or even subgroups within a population.

Many studies ignore the cultural and social factors that influence how African American parents participate in their children's education. The loss of the black school and the immersion of its students into educational environments whose culture does not agree with the culture of African American families leaves some parents with negative orientations toward the school environment. African American parents are



also at a sociological disadvantage, as social and cultural capital possessed by this population may be under-valued or considered non-existent in the school environment. Also, the majority of teachers and administrators working in urban schools, which tend to serve the largest populations of African American students, are members of a different race and/or class groups. This discrepancy may lead to unintentional biases, miscommunications, and other cultural confusions. The focus of this extended literature review is to identify how historical, social, and cultural factors influence African American parents' involvement.

Historical Factors

Segregated, Black Schools

The literature concerning African American education shows a legacy of discrimination and inequality, particularly after 1954, when *Brown v. Board of Education* overturned the court's previous ruling legalizing segregation (Ladson-Billings 2006, Lareau & Horvat 1999). This legacy resulted in an attitude of mistrust and negative orientations among some African American parents towards the school environment. These findings do not accurately represent the historic value placed on education in African American communities before desegregation. Slaves risked their lives to learn how to read and write. After slavery, communities of freedmen showed great resilience in creating educational opportunities for themselves. These efforts were a manifestation of the idea that "literacy is a contradiction to oppression" (Anderson as cited in Klugh, 2005). Many African Americans believed that by becoming literate, they would be able to find opportunities other than the menial work that trapped them in poverty.

Along with the church, schools were the center of the African American community. Teachers and principals were residents and active participants in the communities they served. Segregated black schools did face tremendous challenges, as many were one-room structures employing only one teacher. They were overcrowded, under-funded, and

in some cases, operated only a few months during the year. Although their resources, both economic and material, were grossly inadequate when compared to those of white schools of the time, black segregated schools were largely successful. In some cases they outperformed their white counterparts. Schools such as Dunbar High School in Washington D.C., Booker T. Washington in Atlanta, and Fredrick Douglass in Baltimore have been documented by alumni and former educators as highly successful institutions (Siddle-Walker, 2000).

In Siddle-Walker's (2000) analysis of African American schools and communities from 1935 to 1969, the author identifies four common characteristics of these successful, segregated schools. The first characteristic is exemplary teachers, who are typified by their dedication, high expectations, and challenging teaching styles. The second characteristic is relevant curriculum and extracurricular activities. These schools sought to provide students with the same courses and training that white students were receiving elsewhere. Clubs were offered to focus on special talents and future responsibilities (i.e. 4H, etiquette clubs) relevant to students' lives outside of the school. The third characteristic is leadership of the school principal. The principal stood as the face of the school, communicating with the community as well as with white officials on behalf of the school. The principal also served as the ultimate role model for students and school staff by demonstrating daily the leadership and values to be instilled through the school. The fourth characteristic of successful black schools is parental support. Black schools operated with an attitude of self-help. They survived because of parents' financial support, both in terms of monetary gifts and the donation of furniture and other goods. Some families made financial sacrifices by sending their children to school rather than to work. A participant in Edwards' (1993) study recalls that PTA meetings at her school were seen as social events, and often were standing room only. It is important to note that these same characteristics can be found in schools that are successfully serving African American families today (Kuykendall, 2004, Polite & Davis, 1999).



Post-Segregation

After desegregation, many black schools were closed and their students bused to bigger white schools. Black teachers and principals were displaced or demoted, and black PTA's were disbanded. White teachers, principals, and parents were not ready to accept African American students as equals, regardless of how the courts ruled. Virginia's Prince Edward County public school system was completely shut down to avoid integration. White students attended private schools, but no accommodations were made for African American students. Many missed nearly five years of their education. In other cases, white teachers and students flocked to private or suburban schools, a phenomenon known as white flight. For example, in Richmond, the percentage of white students declined by nearly half in fifteen years (VA Historical Society 2004). As a result, integration was nearly non-existent in these schools, and its benefits (i.e. resources, facilities, teachers) never materialized. Though African American students were able to access the resources made available through integration, they were not given equal opportunities to succeed. Trent and Artiles (1993) said:

When black children integrated schools, they were met generally by white administrators and teachers who were unprepared to deal with their cognitive styles, social values, belief, customs, and traditions. Because of the discontinuity that developed overnight between home and school cultures, these personnel began teaching black children with preconceived notions and stereotypical views about how they functioned (as cited in Edwards 1993).

Sociological Perspective

Social Capital

After desegregation, the difference between the new school culture and the home culture of African American students and parents resulted in social inequalities, which in turn inhibited parent involvement. Consider Bourdieu's concept of field and habitus; the "habitus" is understood as the attitudes and dispositions developed from "social training and past experience" (Brubaker

as cited in Lee & Bowen 2006). The "field" is "a structured system of social relations at a macro and micro level" (Grenfell & James as cited in Lee & Bowen 2006), or when applied to this research, the school environment. In segregated black schools, the habitus of African American parents agreed with the field. "When an individual's habitus is consistent within the field in which he or she is operating... he or she enjoys a social advantage" (Lee and Bowen 2006, Laureau and Horvat 1999). One's habitus may be partly developed through the use of social capital, or the development of social networks and means of gaining information (Lee and Bowen 2006). If an individual's habitus does not agree with the field, then his/her social capital is not likely to be valued in that field. In the home-school relationship, social capital may be obtained through visits to the school and communication with other adults involved in the environment. It is a "means by which parents can promote their children's school achievement and educational attainment" (Coleman as cited in Lee and Bowen 2006). Due to the extinction of African American parent/teacher associations, busing to different neighborhoods, and differing communication styles between parents and teachers, African American social capital became unvalued, if not non-existent.

One limitation in many of the studies concerning parent involvement among racial groups is the disregard for class differences within one group. Laureau and Horvat (1999) argue that everyone, regardless of race or class, possesses some type of capital. However, not all capital is valued the same in different fields. Those authors also propose that some people lack the ability to use the capital they possess in certain fields, which may be related to social class. A study by Diamond and Gomez (2004) investigating class differences in African American parent involvement illustrates Laureau and Horvat's findings. The authors found that middle class parents, identified as such by educational attainment and profession, were more likely to choose their children's schools, work with the school to influence course placement, and manage important transitions. These parents



were perceived as being more supportive of the teachers and the school. The middle class parents also reported having a better understanding of the education system, teacher pedagogy, and the curriculum. Working-class parents in the study were more likely to be assigned to schools and defer educational planning to school officials. They were also more likely to be perceived as confrontational when a problem did arise. School officials identified the working-class parents as being actively involved at the school, but not in the same way as the middle-class parents. The difference between the two sets was the way they used their social capital to navigate the school environment.

It is important to keep in mind that one's membership to a certain race or class does not determine parent participation. One problem with the Diamond and Gomez study is that the middle-class sample was selected using a snowball method in which the parents were referred to the researchers by the original set selected. Their perceived social capital may be the result of their relationship to one another as opposed to their membership to the middle-class.

Cultural Capital

The parents of African American students also lacked the cultural capital valued by the white school. Cultural capital is considered knowledge of the "high brow" culture or cultural cues (Rescigno & Alnsworth-Darnell 1999). It may include the cultural knowledge gained through listening to music, reading literature, and observing artwork. In addition, cultural capital includes access to institutions and people beneficial to educational attainment. African Americans and other cultural minorities possess a wealth of cultural capital that may not be valued in the school environment. For example, "fictive kinship" networks, or extended family or community members stepping in to help raise a child in African American communities, may not be as valued by the school as participation in a school based parent program. Knowledge of oral tradition and story telling may not be as valued as reading classic literature. Even the traditional methods of teaching displayed in the

old, segregated schools are no longer valued and have been replaced with less structured, child-centered practices. Delpit (1995) writes about her experience working with two "old-school" black teachers in a south Philadelphia school: "they [the black teachers] made students sit down at their desks, they made students practice handwriting, they corrected oral and written grammar." In Delpit's experience, those teachers were viewed as "repressive" and old-fashioned.

Cultural Confusions

Teachers' Perceptions

As noted earlier, all parents possess some form of social and/or cultural capital; due to cultural confusions those forms may not be noticed or valued in the school setting. Cultural confusions also lead to negative orientations among African American parents. These confusions deal with misinterpretations of oral and physical communication, values, and beliefs (Delpit 1995). Teachers are a crucial component in the home-school relationship. Many studies of parent involvement are based on teacher's reports of involvement. This method is limiting, because teachers can only assume to know how parents participate outside of the classroom. The educational aspirations and expectations parents hold for their children have been found to be one of the best indicators of involvement (Jeynes 2003, 2005, 2007). Overstreet, Devine, Bevans, and Efreom's (2005) study of 159 economically disadvantaged African American students found that parents generally had high aspirations of their children, such as graduating high school and attending college. However, parents' perceptions of school receptivity may be one of the best predictors of school involvement (Overstreet et.al. 2005, Drummond & Stipek 2004). Just as teachers assume they know the attitudes and intentions of parents, parents enter the school with perceptions that affect the way they feel the school sees them and their children. In the Diamond and Gomez (2004) study, working-class African American parents felt that their involvement was not welcome in the school. They felt teachers and administrators viewed their lack of education as preventative of effective



participation in their child's education. The working class parents' interaction with the school was viewed as defensive and unsupportive; parents and teachers felt a mutual distrust and sense of disrespect in their communications.

Communication Styles

Teachers' perceptions of the value parents place on education are positively related to student's academic achievement (Hill & Craft 2003). However, teacher perceptions may be rooted in assumptions and stereotypes based on cultural confusions. Hughes, Gleason, and Zhang (2005) found that teachers generally rated their relationships with Hispanic and Caucasian children as better than with African American students. The author attributes differences in parenting practices, communication styles, and educational beliefs between white teachers and African American parents to the lack of relatedness reported by teachers. Delpit (1995) provides two certainties that result from significant differences between the home/school cultures, both of which may be applied to parents as well as students. First, "teachers can easily misread students' aptitudes, intent, or abilities as a result of the differences in styles of language use and interactional patterns." African American students, particularly males, are more likely to respond to firm, direct statements that mimic the direction they receive at home, such as "take your seats now" as opposed to "would you like to take your seat now." Second, "Teachers may utilize styles of instruction and/or discipline that are at odds with community norms." A teacher of African American students using indirect or implied statements, as in the example above, may be perceived as weak or afraid by the parent/student's community norms. In many cases, someone who is perceived as fearful is "less deserving of respect."

The Hip Hop Generation vs. The Civil Rights Generation

It is not just white teachers who feel disconnected from African American parents. A study of African American female principals in Chicago schools showed there are similar misunderstandings between older educators and

younger parents (Loder 2005). Kitwana (2002) refers to this as the emergence of the "Hip Hop Generation." This group is comprised of African Americans born between 1965 and 1984 who share a set of values, beliefs, and attitudes often at odds with the older "civil rights generation." The principals in Loder's (2005) study expressed concerns over the deconstruction of their communities, and the rise of crime, poverty and teenage pregnancy. They felt that many of the young mothers they encountered lacked the knowledge and experience to raise children. One participant would "often clash with young mothers in her inner-city community who felt entitled to make demands about how the school should be run."

Conclusion

What is the right type of parent involvement for African American students? Some studies have shown that involvement at home, such as exhibiting high expectations and authoritative parenting practices, has the most significant effect on student achievement (Jeynes 2003, 2005, 2007). Other studies suggest that racial socialization and resilience training at home — reminiscent of the old, segregated school — may have a positive effect on African American children, particularly African American males (Mandara 2006, Jones & Palmer 2004). When determining what types of involvement are most beneficial to African American students, the barriers to involvement must also be considered. The historical implications of African American education have a direct influence on how parents interact with schools today. Schools must also recognize the social and cultural capital possessed by this population, and help develop capital when needed. In addition, teacher and administrator biases or stereotypes towards African American parents and students must also be considered, as they lead to distrustful relationships between school and home.

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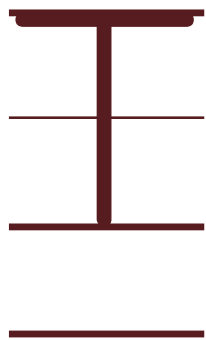
Negative Peer Interactions and the Effects on Sustained Attention

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Abstract

Two of the most important influences on a child's success, adjustment, and attentiveness in the school environment are the formation of relationships with new classmates and teachers. Important life skills begin to develop in early child education programs such as the Head Start program. This study examined the influence that negative peer and teacher interactions have on the amount of time children pay in attentive behavior. One hundred and seventeen Head Start children were recruited from five Head Start centers in a Midwestern community in the United States to participate in an intervention to enhance teachers' classroom management skills and to facilitate children's early literacy, numeracy, rule following, and social skills considered central to school readiness. In each participating classroom, 3-5 children were recruited based on the teacher's global estimation of the children's behavior problems. Approximately half of the children in each classroom were selected to evidence high levels and half low levels of behavior problems. The first hypothesis is that negative peer interactions in preschool aged children will be negatively associated with the time spent in attentive behavior during instructional time, which is supported with a correlation of $-.423^{**}$. In view of these findings, researchers also found that girls who display negative behavior during free interaction time and instructional time have a higher incidence of non-attentive behavior during instructional time.

Introduction

Throughout childhood, children go through several transitions that require adaptation. One of these is the transition to the school setting. At the transition to school, children must meet new academic pressures, follow the rules and routines, develop relationships with new adult teachers with different and unfamiliar expectations, make new friends, and develop autonomy and independence (Ladd &



Price, 1987; McIntyre, Blacher, & Baker, 2006). The manner in which children meet these new challenges can either minimize or contribute to adjustment problems, both socially and academically. (Ladd & Price, 1987).

How children adapt to the school setting and activities has been an important question for many researchers interested in promoting good school transitions, competence and the avoidance of school maladjustment. Two of the most important influences on a child's success, adjustment, and attentiveness in the school environment are the formation of relationships with new classmates and teachers (Ladd, Birch, & Buhs, 1999). These skills begin to develop in early child education programs such as the Head Start program.

Children often enter school and early education programs without the development of skills needed to be successful academically and socially. In a nationally representative survey, 46% of kindergarten teachers reported that more than half of their students did not have sufficient levels of self-regulation (Rimm-Kaufman, Pianta, & Cox, 2000). In a study conducted in Head Start classrooms, teachers reported that problem behaviors related to a lack of social-emotional regulation, such as kicking or threatening others, occurred once a day for 40% of the children (Bodrova & Leong, 2006, p. 205). Teachers are increasingly reporting that it is more important for children to have these self-regulation skills when they enter kindergarten than to have cognitive skills such as knowing the alphabet and numbers. Educators are finding that when these self-regulation skills are missing, it is often much harder to teach children, and it is also harder for children to develop positive and effective relationships with their teachers and fellow classmates.

It may be useful to intervene during preschool to modify behavioral dispositions, because poor self-regulation skills predict later behavioral difficulties such as, negative teacher/peer interactions and academic difficulties.

Prior to kindergarten, children need to learn to refrain from aggressive acts and pursue more positive behaviors. Forming better relationships with teachers, followed by positive classroom participation and self-regulation may help

children gain more peer acceptance in a new school environment.

Increasing teachers' understanding of children's individual differences and their relation to adaptations or problems would provide a focus shift from teachers negative attributions of purposeful misbehavior to active problem solving and behavior management (Rothbart and Jones, 1989).

Self-Regulation

The transition to school is a vital period of development. This is a time when young children develop and use new skills and begin to use language skills to communicate in their social relationships (McIntyre et al., 2006). This transition period also requires the development of self-regulatory behaviors and social skills (McIntyre et al., 2006). One developmental factor that may play an important part in the development of maladaptive behaviors is a child's ability to control behaviors and emotions, also known as self-regulation. Self-regulation involves controlling one's emotions and behaviors in stressful and new situations. Self-regulation has contributed to the development of other adaptive behaviors, including joint attention, prosocial behaviors, behavior control and problem solving (McIntyre et al., 2006). Language, communication, and self-regulation skills are necessary and critical in order to be successful in the school environment and to develop positive relationships with teachers and peers.

Children in the classroom environment are required to block out distractions and focus on parts of the classroom setting that may not be the most engaging or entertaining (Bodrova & Leong, 2006). For example, the child may be required to pay attention to the teacher while a playmate is whispering. Researchers have found links between self-regulation at early ages and children's functioning in school far beyond kindergarten and first grade (Bodrova & Leong, 2006). When these social-emotional regulation skills are lacking, development of aggression, emotional outbursts, inattention, and feelings of being overwhelmed are common. Children



lacking these self-regulation skills are more susceptible to disciplinary problems, are less capable of cooperating or resolving conflicts successfully, and do not participate productively in classroom activities—including learning activities (Ladd et al., 1999). Eisenberg and Fabes (1992) found that self-regulation skills were likely to impact the expression of problem behaviors. Self-regulation skills may be closely related to social skills, which are requisite to successfully negotiate demands from family, other adults in care giving or instructional roles, (e.g. teachers) and peers (McIntyre et al., 2006).

This research indicates that self-regulation affects a child's ability to function successfully in the school environment. Self-regulation skills allow children to conform to classroom rules and benefit from learning in classroom activities. Self-regulation also allows children to use and further develop cognitive processes necessary for academic learning and problem solving (Bodrova & Leong, 2006, chap. 8). A lack of self-regulation skills in young children may also be a contributing factor in the development of maladaptive relationships between the child and his or her teachers and fellow peers.

Peer Influences

The relationships young children form with classmates have been hypothesized to produce several social "provisions" (i.e. supports) that may promote classroom adaptation (Ladd et al., 1999). Close relationships with fellow classmates may provide children with support, such as assistance in class activities or security, and thus facilitate adjustment in the classroom. However, rejection by the peer group may provide the opposite, and lead to poor adjustment to the school environment.

Previous research on children's classroom peer relations indicates that children adapt to kindergarten better when they have a friend, develop a larger network of friends, or are accepted by their fellow classmates (Ladd et al., 1999). It has also been reported that maladjustment occurs more often in children who remain friendless, have fewer friends, and are rejected by their classmates (Ladd,

Kochenderfer, & Coleman, 1996). Children's peer group reputation (liked vs. disliked) determines their access to peer activities. Disliked or rejected children tend to be avoided by peers, denied access to peer activities, and targeted for other forms of exclusion (Ladd, Price, & Hart, 1990). Exclusion from classroom and peer activities may negatively impact a child's classroom participation by lowering motivation or opportunity to engage in activities with peers, such as conversation, play and collaboration in learning (Ladd et al., 1999).

Children's peer acceptance may depend on their behavior. Ladd and Price (1987) suggest that positive social behaviors towards peers in preschool, such as cooperative play and social conversation, predict children's peer acceptance in kindergarten. Likewise, measures of antisocial behaviors in preschool such as rough play, arguing, and aggression forecast higher levels of peer rejection in kindergarten (Ladd & Price, 1987). Peer victimization and negative peer relations among young children have been seen as a growing epidemic in recent years. Kochenderfer and Ladd (1997) found even higher rates of victimization among kindergarten children than in a sample of victimized students in grades two through six, as well as students in grades seven through nine; 22.6% of their sample of 5-6 year old children reported a moderate to high level of peer victimization.

Peer relationships are a very important component in understanding children's behavior in the classroom setting because peer rejection may operate as both a psychological and behavioral barrier to a child's participation in the classroom. If these negative relations with peers are not targeted and treated at an early age, such as three to five years, more severe problems may occur in the years that follow.

Teacher Influences

Children's behaviors also affect the relationships they form with teachers, and these relationships affect the child's subsequent behavioral and academic adjustment (Birch & Ladd, 1998). Prior research has shown that teachers' perceptions of children's behaviors are



associated with the attitudes they form toward those children (Birch & Ladd, 1998). Teachers tend to like children who show cooperative, cautious, responsible behavior and self-regulation in class over those children who show disruptive, assertive, and independent behaviors (Wentzel, 1991). Pianta and Steinberg (1992) have shown that problem behaviors, such as conduct problems, internalizing, and learning difficulties are negatively associated with the quality of early teacher-child relationships, which may impact the child's academic progress.

Studies have shown that close teacher-child relationships are associated with prosocial behavior styles and positive child outcomes, such as academic competence, liking school, and classroom participation. Teacher-child relationships that foster closeness in kindergarten have been associated over time with increases in children's prosocial behavior and decreases in children's antisocial behavior (Birch & Ladd, 1998). However, research has also shown the opposite relationship happening. Conflictual teacher-child relationships are associated with negative outcomes such as unfavorable school attitudes, school avoidance, disengagement and poor academic performance (Birch & Ladd, 1997). Children who exhibit these asocial behaviors may actually limit the extent to which others will approach and interact with them, promoting further isolation and antisocial behaviors. Children who have dysfunctional or angry teacher-child relationships in kindergarten display more negative behavior in their first-grade classrooms than do their classmates who have positive teacher-child relationships (Pianta, 1994).

Academic Success

The previous discussion indicates teacher-child and peer relationships can have an affect on academic success as well as adjustment to the classroom environment. Research has shown that negative peer and teacher-child relationships may inhibit a child's participation in classroom activities and attentiveness to instruction. Children show evidence of greater success in forming positive or supportive relationships in the classroom when they develop more adaptive

styles of classroom participation (Ladd et al., 1999). Children who manifest more adaptive forms of classroom participation tend to have higher levels of achievement (Ladd et al., 1999).

Evidence also suggests that children with greater cognitive maturity (ability and readiness) perform better academically and form better relationships with teachers (Ladd et al., 1999). It seems that children who exhibit prosocial styles of behavior provide their peers with social benefits such as helping and sharing access to materials, which in turn promotes close and supportive ties. Relationships that provide social and academic support for young children, such as peer group acceptance and close teacher-child relationships, predict higher levels of conformity to the student role, exploration, and class participation (Ladd, Birch, & Buhs, 1999).

Summary

The evidence suggests that negative relationships with teachers and peers at an early age can promote the maladjustment of children in the school setting and lead to negative outcomes. Research on teacher-child and peer relations supports the idea that when children lack these connections, academic success may be limited and impaired. Children who lack positive social relationships often do not pay attention to classroom material or participate in academic activities. However, children are not able to develop these important social relationships because they do not have the self-regulation needed to participate in a school environment.

In view of these findings, it is hypothesized that negative peer interactions in preschool aged children during free interaction and instructional time will be negatively associated with the time spent in attentive behavior during instructional time.

Method

Participants

One hundred and seventeen Head Start children were recruited from five Head Start centers in a Midwestern community in the United States to participate in an intervention to enhance teachers' classroom management skills and to



facilitate children's early literacy, numeracy, rule following, and social skills central to school readiness. In each participating classroom, 3-5 children were recruited based on the teacher's global estimation of the children's behavior problems. Approximately half of the children in each classroom were selected to evidence high levels and half low levels of behavior problems.

Measures

Five trained observers visited participating classrooms several times throughout the fall semester and gathered data on the participating children. Children's behavior was rated by the observers using a detailed observational coding scheme, the Classroom Observation Coding System (COCS). The COCS is a 7-second interval coding system that assesses target children's positive and negative social behavior with peers and teachers, and their disruptive, off-task behavior and attention during instructional periods.

Observations of the behavior of each child were obtained from October to December on three occasions in an approximate random order, in the fall of the Head Start year. On each occasion, observers identified the target children and then coded the behavior for 24 consecutive intervals or a total of 2.8 minutes. Observers positioned themselves in the classroom to hear and see the child's behavior, but to do so in an unobtrusive manner. Prior to data collection, observers were trained to a criterion of 70% agreement (or reliability) on a code-by-code basis.

Three child behavior codes from the COCS were used in the analyses in this study: sustained attention during instructional time, negative social behavior during free play, and negative peer interactions. Sustained attention in the COCS is a code used during instructional (teaching) time. This code can be coded as "yes" or "no" for child sustaining attention. In order to receive a code of "yes," the target child must be paying attention to and cooperating with the teacher, or staying on-task, during a 7-second interval. Sustained attention is indicated by eye contact toward the instruction or task at hand, motor and verbal behavior relevant to the task, and positive social behavior relevant to the task

that is directed either at peers or the teaching staff. Sustained attention is coded when the child at hand is on-task and attentive for at least 50% of the interval. However, if any negative social behavior occurs during the interval, the interval cannot be coded as "yes" to sustained attention and must be coded as negative social behavior.

Negative social behavior during free play and instructional time in the COCS is defined as verbal or physical actions that are directed toward either peers or teachers that are disruptive, aggressive and inappropriate. These actions include but are not limited to negative verbalizations (teasing, name calling, threats), physical behaviors (hitting, kicking, spitting), and blatant rule breaking. Negative social behaviors also include behaviors that are not directed at a specific target but are disruptive to the class as a whole, such as being loud or overactive. The code of negative social behavior also includes displays of the negative affect, such as yelling, an angry face, or clenched fists. Destruction of property is also coded using this category.

The last code used in this analysis is peer negative behavior. This code is used when a peer directs a negative social behavior, either verbal or physical, to the target child. This behavior may be negative in terms of content, topography, and affect. This includes threatening and angry commands by peers.

Results

Analyses were conducted to address the following aims. First, the rate per minute (rpm) of negative social behavior in free interaction and instructional time was calculated, as well as the amount of time spent in sustained attention. Second, correlational analyses were used to see if the time children spent in sustained attention during instructional time was correlated to the rpm of negative social behavior they displayed during free interaction and instructional time. Third, a t-test was used to examine whether there were gender differences in rates of negative behavior and sustained attention.

Table one shows the rpm occurrences of negative social behavior both in free interaction and instructional time, and the rpm that was spent



in sustained attention. The average occurrence of negative social behavior in free interaction occurs once every 2-minutes. The rpm occurrence of negative social behavior during instructional time is once every 9-minutes. Results showed that children spent nearly half of their time in sustained attention during instructional time.

Table 1.

Rate per minute of Negative Social Behavior in Free Interaction and Instructional time and time spent in Sustained Attention			
	Negative Social - Free Interaction	Negative Social -Instructional	Sustained Attention
Mean	.5503	.1089	51.31
SD	.5785	.3706	12.45

The three individual constructs, negative social behavior during free interaction, negative social behavior during instructional time, and sustained attention during instructional time, were correlated. Negative social behavior during free interaction was negatively correlated with sustained attention in instructional time. Negative social behavior during instructional time was also negatively correlated with sustained attention during instructional time. See Table 2.

Table 2.

Correlations among Negative Social Behavior During Free Interaction and Instructional Time, and Sustained Attention during Instructional Time		
	Negative Social - Free Interaction	Negative Social -Instructional
Negative Social-FI Sustained Attention		.176
-Instruction	-.280**	-.423**

** $p < .01$

These behavior-behavior relationships were further investigated by gender. T-test comparisons showed that girls engaged significantly but at slightly higher rates of negative social behavior during instructional time than boys, but there were no gender differences in rates of negative behavior during free interaction and in the percentage of time boys and girls attended during instructional periods. See Table 3.

Table 3.

	Male		Female	
	M	SD	M	SD
RPM Negative Social-Free Interaction	.55	.56	.55	.60
RPM Negative Social-Instruction	.05***	.15	.17***	.50
% Time sustained Attention-Instruction	50.7	13.2	51.9	11.8

*** $p < .001$

The correlations among negative social interaction during free interaction and instruction time and sustained attention during instructional time also showed gender differences. All of these behavior-behavior correlations were larger for girls than for boys in time spent in sustained attention during instruction. Boys still showed significant results between negative social behavior during instruction and the amount of time spent in sustained attention. See Tables 4 & 5.

Table 4.

Correlations among Negative Social Behavior During Free Interaction and Instructional Time for Girls		
	Negative Social -Free Interaction	Negative Social -Instruction
Negative Social -Instructional	.293*	
Sustained Attention -Instruction	-.431**	-.592**

** $p < .01$, * $p < .05$

Table 5.

Correlations among Negative Social Behavior During Free Interaction and Instructional Time for Boys		
	Negative Social -Free Interaction	Negative Social -Instruction
Negative Social -Instructional	-.152	
Sustained Attention -Instruction	-.132	-.339*

* $p < .05$



Discussion

The major purpose of this study was to investigate the relationship between negative social behaviors in preschool aged children during free interaction and instructional time with the time they spend in attentive behavior during instructional time.

The first focus of analysis was the rpm of negative social behavior in free interaction and instruction time, and time spent in sustained attention. Results indicated that the average occurrence of negative social behavior in free interaction is once every 2-minutes. The rpm occurrence of negative social behavior during instructional time is once every 9-minutes. Results showed that children spent nearly half of their time in sustained attention during instruction time.

These results can be related to previous research findings in that the self-regulation skills used during sustained attention are highly important. When these skills are lacking, they are likely to impact expression of problem behaviors. When children are engaged half of the time in sustained behavior, the other part of the time they are engaging in some sort of negative social behavior, both in free interaction and instructional time. This further supports the notion that when self-regulation skills are not present it can affect the child's ability to function successfully in the school environment.

The second hypothesis of this study investigated whether the time spent in sustained attention during instructional time was correlated to the rpm of negative social behavior displayed during free interaction and instructional time. Results indicated that these three individual constructs; negative social behavior during free interaction, negative social behavior during instructional time, and sustained attention during instructional time were all correlated. Negative social behaviors during free interaction correlated with sustained attention in instructional time ($r = -.280$). Negative social behavior during instructional time was also negatively correlated with sustained attention during instructional time ($r = -.423$).

These results further support the statistics and

findings from previous research, re-asserting that when children are engaging in negative social behaviors they are not engaging in sustained attending behavior. The correlations also revealed a stronger relationship of negative social behaviors during instructional time than during free interaction time. Research shows that when children are not engaging in self-regulating and sustaining behaviors, their academic and social development can be affected. Bodrova & Leong (2006) found that self-regulation allows children to further develop cognitive processes used for academic learning, problem solving, and contribute to the development of relationships between children, their teachers and fellow peers.

To further investigate these individual constructs, gender was examined and accounted for. A t-test comparison showed that girls engage in significant but slightly higher rates of negative social behaviors during instructional time (nearly once every 12 minutes), but there were no gender differences in rates of negative behavior during free interaction and in the percent of time boys and girls spend in attending behavior during instructional time. See Table 3.

These results were contrary to what would be expected and usually found. Age and sample size are not used as an explanation, because gender samples were balanced and all participants ranged from age 4 to 5. A possible explanation for the behavior could be that when girls engage in these negative social behaviors, they are paid more attention, because these kinds of negative behaviors are less socially acceptable for girls. However, when boys engage in these overt negative behaviors, it is generally considered more typical of male gendered behaviors.

The correlations between negative social interactions during free interaction, instructional time and sustained attention during instruction time also revealed gender differences. All of these behavior-behavior correlations were stronger for girls than for boys. Boys still showed significant results between negative social behavior during instructional time and the amount of time spent in sustained attention. See Tables 4 & 5.

These findings have important implications for the future education of preschool aged children.



These findings show that a significant proportion of children's time is not spent learning conducive behaviors. Only half the time of these children is spent in self-regulating, attending behavior, which means the other half of the time they are engaged in non-productive behaviors, presumably some type of negative social action.

Better program development will allow more of the children's time to be spent in attending learning behaviors. Research shows that children entering kindergarten are not prepared academically or in terms of socially attending behaviors. This age (3-5) is a critical time to teach these behaviors so that children are prepared as they move into higher levels of education. Another implication of these findings has to do with the development of relationships. When children engage in negative social behaviors it hinders the development of relationships with teachers and fellow classmates. When these relationships are lacking, the absence thereof also affects their academic success. Children with fewer positive social relationships experience more exclusion from classroom and peer activities, which further negatively impacts the child's classroom participation (Ladd et al., 1999). Previous research (Pianta & Steinberg, 1992) found that problem and negative behaviors are associated with the quality of teacher-child relationships, which may impact their academic progress.

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Molecular Detection of ammonia- oxidizing microorganisms in salt plains soils

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Abstract

The two prokaryotic domains, Archaea and Bacteria, share many characteristics although they differ genetically and metabolically. Archaeal species, for many years after the group's discovery, were thought to be found only in extreme environments. Recent research has found that non-extreme Archaea exist, group Crenarchaeota, and are widely distributed in the environment. Studies have also shown that certain species can oxidize ammonia to nitrite, using proteins that are believed to have branched from Bacterial ammonia-monooxygenase. Crenarchaeota ammonia-oxidizers have been found to be the predominate prokaryotes in soil and ocean environments. Though Archaea have been found to be abundant in non-extreme environments, their role in environmental processes is not well known. The purpose of this study is to attempt to detect the presence of ammonia-oxidizing archaea, while continuing the study of *amoA* bacterial genes, in salt plains soils. The salt plains microbial observatory is located near Cherokee, Oklahoma. This environment, due to its rapid changes in salinity and high summer surface temperatures, is considered an extreme environment. Most organisms that live on the salt flats must be highly adaptable to these conditions. Gel electrophoresis of PCR product has shown, with preliminary results, that *ammonia monoxygenase (amoA)* gene is present, of bacterial origin, in salt plains soils. Knowing whether or not Archaea ammonia-oxidizers exist on the salt plains, could open many different research opportunities; so far the results from amplification of soils with the archaeal primers has been inconclusive, and further exploration is needed. This study was funded by NSF microbial observatory grants, and NIH KIMBRE grant.

Microorganisms have had a unique history since their discovery, in Leeuwenhoek's first recorded observations in the 1600's. Since their discovery they have sparked the interest of many scientists throughout history regarding the role these organisms have in our everyday lives. Microorganisms were found to play a role in disease, nutrient



cycling, and important symbiotic relationships, such as gut bacteria in herbivores [1, 2]. With the increase in dependence on agriculture for food production, also comes an increased interest in nutrient cycling and interest in organisms responsible in aiding the cycling of nutrients in the environment [1-4]. The most well-known group of prokaryotes is bacteria. This group was the only one known to exist until the discovery of Archaea in the late 1970's [1, 2, 5]. As prokaryotes, both Bacteria and Archaea share many characteristics; they are generally single celled, contain no internal cellular organelles, have no nuclear membrane, and reproduce by binary fission. The proposal of the three domain system by Woese, a prominent microbiologist, changed the way many microbiologists see the world [5, 6]. Woese's proposal involved recognizing a group of prokaryotes that differ greatly genetically, and metabolically, with those prokaryotes that we call Bacteria [1, 6]. In fact, they found that in genetic comparisons, in certain aspects, these microorganisms were more related to eukaryotes, the group to which multicellular organisms, such as fish and algae, belong [2, 6]. The accepted name of this group is Archaea [6]. New research opportunities have resulted from a recent discovery of a Crenarchaeotal, (or non-extreme environment Archaea) group that can oxidize ammonia. In this paper, a few characteristics of the two prokaryote groups, Archaea and Bacteria, will be discussed specifically, including further discussion of certain subgroups involved in the environmental processes of nitrification, the enzymatic oxidation of ammonia to nitrite for energy. Nitrification performed by these microorganisms in natural systems such as oceans and soil ecosystems is extremely important to the nitrogen cycle of the earth [1-4, 7-9] providing essential compounds to allow life to thrive [1, 2, 4, 7, 8, 10-12]. The closing aspect of the paper will discuss briefly current research involving nitrifiers, in the group Crenarchaeota, at the salt plains microbial observatory, which is limited when applied to ammonia oxidizing-bacteria and in describing Archaeal nitrification, non-existent. The research proposed for the salt plains project includes

detecting Archaeal species that may perform nitrification in this highly saline environment, along with continuing research on bacterial amoA gene abundance. A review of the available literature indicates that research on archaeal nitrifiers in high salt environments does not exist. This area needs further investigation to better understand the microbial communities that are active at the salt plains.

Bacteria, found in most every environment [2, 4, 12-41], are incredibly important for many processes such as food processing, agriculture, personal health, and bioremediation [1, 2, 4, 11, 29, 33, 42]. Archaea, as a relatively new domain [5, 6], have been found in a variety of environments from hot springs, deep ocean trenches, ocean waters, and soils [1, 8, 9, 17, 28, 34, 40, 43-46]. Archaea's unique DNA fingerprint has required Polymerase Chain Reaction (PCR) primers to be designed specifically for each Archaeal group, such as Crenarchaeota and Euryarchaeota, and even more specific primers for individual species [4, 7-9, 11, 36, 40, 43, 46-49]. The cell wall and cell membrane of Archaea are unique in comparison to Eukarya and Bacteria. The cell wall contains proteins and glycoproteins which differ from the peptidoglycan found in Bacteria. The cell membrane contains many ether linked branched fatty acids, which can be cross membrane. These fatty acids differ greatly from that of ester linked fatty acids found in all other organisms [1, 2, 4, 5, 9]. The composition of the membrane allows for these organisms to survive in environments where many other organisms would die [1, 2, 4, 6]. Recently, Archaea have defied traditional view by the discovery of a non-extreme environment, Crenarchaeota, which share habitats with bacteria in normal environments [1, 2, 4, 7, 8, 36, 40, 42-49]. Archaea have been shown to be the predominate prokaryotes in the environment and planktonic Archaea in the group Crenarchaeota could be the most abundant organism in the ocean environment, dramatically changing the traditional perception of the environment. Studies of Archaeal nitrification in the ocean increase our understanding of the role of



Archaea in the nitrogen cycle [1, 2, 8, 9, 49, 50]. Since the study of these organisms does not exist for salt plains soils, it is important to explore in order to confirm that nitrification is performed in nearly every environment on the planet.

The salt plains microbial observatory is a unique extreme environment, located near Cherokee in northern Oklahoma. The natural artesian flow of salty ground water allows for salt crystals and brine pools to form on the surface after evaporation of the water. After a short duration of the heavy rainfall the salt crystals on the surface dilute and rapidly change the salinity of the environment. This requires most of the organisms on the flats to be adaptable to rapidly changing temperature and salinity. The goal of the research on the salt flats is to explore and phylogenetically characterize the organisms that inhabit this environment [34, 35, 41, 51].

Methods

The current study at the salt plains makes use of the many molecular techniques that have been developed and fine-tuned in recent years. The techniques applied in this study of ammonia-oxidizing Archaea and Bacteria at the salt plains include: pure culture isolation, direct soil extraction, and qualitative (end-point) and quantitative (real-time) PCR. Direct soil extractions are performed on samples taken from several key sites at the salt plains microbial observatory. The sites include Henley South, Henley Central, and a salt gradient site chosen at the west end of the salt flats. Samples were taken with a sterile spatula and placed in labeled whirl-pak bags. Samples taken were either placed in dry ice, to freeze for later analysis, or placed in a cooler for live sample processing. Live samples were processed within a 5 hour period, and frozen samples were stored at -80°C . Live samples were inoculated into sterilized broth media selective for ammonia-oxidizing bacteria, ATCC media #2265, modified by adding 10% NaCl. Two cultures were inoculated, incubation occurred either in a 5% carbon dioxide incubator at 37°C or with the sample set out on the bench top at room temperature. Both samples were incubated in the dark. 10 μL transfers to fresh media were

made after four months of incubation. Frozen samples were extracted using a modified protocol from Burgmann et al. [50] Soil samples were measured with sterile spatulas, 0.5g of sample was added to a 2mL microcentrifuge tube. 0.75g of glass silica beads were measured out and placed in the tubes with the soil samples, and 1.25mL of the extraction buffer was added. The microcentrifuge tubes were capped tightly and shaken in a Scientific Industries Disruptor Genie for three minutes at maximum revolutions at room temperature. After disruption, the samples were centrifuged at 16,000xg for 5 minutes to remove sediment. About 1mL of the supernatant was transferred to another labeled 2mL microcentrifuge tube, and extracted with 350 μL of equilibrated phenol at pH 8. The solution was gently mixed by inverting the tube, and was centrifuged at 16,000xg for 5 minutes to separate phases. Transferring the aqueous phase to a new tube, it was extracted with 350 μL of chloroform-isoamyl alcohol 24:1 and mixed gently by inverting. The tube was then centrifuged at 16,000xg for 5 minutes to separate phases. 700 μL of aqueous phase was transferred to a fresh tube and 750 μL of the following precipitation solution was added: 20% of polyethylene glycol 6000 in 2.5 M NaCl solution. The solution was mixed gently and incubated for one hour at 37°C . DNA was centrifuged for one hour at 16,000xg at room temperature. After centrifugation, the pellet was rinsed with 500 μL of 70%, with care taken not to dislodge the DNA. The DNA pellet was resuspended with 300 μL of pH 8.0 T.E buffer. The salt gradient samples yielded DNA concentrations, as measured with a spectrophotometer, in table 1. Soil extracts were stored at -20.0°C until analyzed using PCR amplification. The primers used for AOB (ammonia-oxidizing bacteria) were from the paper Horz et al.[28]. The primers used for AOA (ammonia-oxidizing Archaea) and Crenarchaeota 16s were from the paper Lam et al.[49]. Each of the primers had a unique PCR cycle setting for both endpoint PCR and real-time PCR. The Cren and AOA primers were not used in quantitative PCR. The protocol for the PCR cycle settings have been abandoned due to the lack of



a positive control (an organism that is known to contain the appropriate gene segment). The PCR protocol for the AOB occurred in three stages; the first stage began with 1 minute at 94°C. The second stage reaction cycles were performed in three steps beginning with 30 seconds of melting at 94°C (melting), 1 minute at 55°C (annealing), and 1 minute at 72°C (extension). These steps were repeated 30 times. The last stage in PCR is a final extension at 72°C for 2 minutes.

Table 1

Soil Sample	Weight of soil (g)	OD – (interference)	Measured DNA
Low Salt (1)	.599g	1.369	6,845ng/uL
Med Salt (1)	.539g	0.95	4,705ng/uL
High Salt (1)	.530g	0.963	4,830ng/uL
Low Salt (2)	.610g	0.329	1,645ng/uL
Med Salt (2)	.541g	1.147	5,735ng/uL
High Salt (2)	.524g	0.86	4,300ng/uL

The annealing temperature settings remained the same, but the times changed for gene counting for real-time PCR. Real-time PCR is set in four stages. The first stage was at 95°C for 5 seconds. The next stage began with 95°C for 5 seconds (melting), 55°C for 15 seconds (annealing), and 72.00°C for 20 seconds (extension) with optics on the extension step. These steps were repeated for 35 cycles. The third stage was 15 seconds at 72.00°C (final extension). The final stage was a melt curve which ran from 50°C to 92°C. The standard curve for gene abundance was constructed using PCR product of amplified *Nitrosomonas europaea*, an organism known to have the *amoA* gene. The DNA content of the product was measured and diluted in a series of 10-fold serial dilutions. The samples were run using a Cepheid Smartcycler real-time PCR machine. Sybr perfect real-time reaction mixture was used, with Sybr green as the fluorescent dye. The points were plotted with sigma plot, on a semi-log scale. The slope and intercept of the line were determined by linear regression. The x, the gene abundance, was calculated by solving for x in the formula $y = m \log x + b$, yielding the equation $10^{((y-b)/m)}$.

Results

Incubation of the inoculated culture media showed signs of growth in the media after approximately 6 months at 37°C and increased CO₂ atmosphere. Preliminary amplification of the samples has not shown a result. Microscopic wet mount observations have shown single cells and clusters dispersed in the media. DNA direct soil extractions have produced a range of DNA concentrations from 1200ng/uL to 7300ng/uL. Endpoint PCR showed a band in the approximate region of 491bp the size of the amplicon, from the Henley South site, that the *amoA* primer sets were designed to amplify (fig.1). The amplification with the *amoA* primers has been consistent. The standard curve yielded the equation $x = 10^{((34.14 - Y)/3.02)}$ the slope $m = -3.02$ and the y-intercept $b = 34.14$ with an r squared value of .98026. Thus far, soil extracts have not yielded viable results real-time amplification. The Crenarchaeota 16s primers and the ammonia oxidizing archaea primers were not used due to the lack of a positive control.

Figure 1



PCR was run with a reaction volume of 50 microliters, using Takara polymerase, at an annealing temperature of 55 degrees. The template included a blank (11), *Nitrosomonas* extract (9), and four lanes of DNA extracts from salt plains soils (5-8). The occurrence of a single light band in two of the soil extract lanes is a presumptive detection of the *amoA* gene in salt plains soils. Limited or non-existent non-specific products were formed during amplification suggesting an optimum annealing temperature.

Discussion

The organisms found in the pure culture need to be analyzed further to determine origin and whether or not the organisms can oxidize ammonia or whether they are contaminant. To confirm the amplified 491-bp segment is the *amoA* gene, cloned genes would need to be sequenced and compared to current databases of ammonia monooxygenase genes. The procedure may need to be adjusted to compensate for the varied DNA extract concentrations in different soils. DNA content of the template may be too high or low for the real-time PCR conditions to amplify the gene in the sample. Another possibility is that the gene abundance may be too low to quantify with real-time PCR. Considering that most of the samples that have been extracted were taken during the summer (May to August) to late fall (September to November), the salt flat surface temperatures may be high enough to reduce the activity of certain types of bacteria, possibly those that perform nitrification. This may have resulted in limited amplification of the genes in salt plains soils when running real-time PCR. Many of the soil samples that have been amplified using real-time PCR have been beyond the sensitivity of the method >34 cycles or have not melted at a temperature higher than 85°C during the melting curve. More temporal studies are needed to rule out the low measures of gene abundance with quantitative PCR. Activity assays along with the amplification of the gene may give a more definitive answer in the role of *amoA* at the salt plains.

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Health Practices of African American Emerging Adults Regarding Drug Use and Sexual Behaviors

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Abstract

The purpose of this study was to investigate the health behaviors of emerging adults, particularly African Americans aged 18-25. Currently, there is a dearth in the literature regarding health behaviors of this population, yet this population is disproportionately affected by drugs and high HIV/AIDS rates. Participants included college and non-college African American emerging adults aged 18-25. Participants came from a predominately Caucasian institution and from the surrounding community in the Midwest. The results showed that both African American populations had not really talked much about sex or drugs with their parents or significant others. The participants were hard pressed to come up with ways to curb the spread of HIV or drug use. Study limitations and future research will also be discussed.

Introduction

Drug use among young people and adults in the United States has soared to a disconcerting rate in the past several years. Experts estimate that 48% of adolescents use some type of illegal drug (National Institute on Drug Abuse, 2003). A large body of research regarding this population exists; however, recently, a new subgroup has developed. This group, termed "emerging adults," consists of individuals transitioning out of teen years and into adulthood. As a whole, members of this group do not consider themselves full-fledged adults (Arnett cited in Arnett, 2000). These individuals, aged 18-25, are spending more time focusing on education, exploring possible career paths, and waiting longer to get married and have children (Barry & Nelson, 2005). In society, these milestones have traditionally been considered indicators for adulthood (Barry & Nelson, 2005). However, individuals within this subgroup are placing less importance on traditional milestones and more emphasis on individual growth and maturity (Arnett, 2000). Many emerging adults consider independence (financial, emotional,



etc.) and self-reliance key characteristics in their perceived success in becoming adults. In a study by Barry & Nelson (2005), two-hundred thirty-two ethnically diverse college participants (70.7% European American, 10% African American, 9.9% Asian American, and 3.4% Latino, and 5.4% other) were asked if they considered themselves adults. Participants most commonly responded that they were not completely adults (Barry and Nelson, 2005). The majority of participants felt they lacked many of the attributes they needed to be fully considered adults. In essence, because they are spending these years in transition, many emerging adults feel stuck between adolescence and adulthood.

Emerging adults are an interesting population because of their engagement in risky behaviors. Illegal drug use, binge drinking, and driving while intoxicated are at a peak for this age group (Arnett, 2000). This group is difficult to track because of diversity regarding work and school attendance. In light of this, reporting on the elevated amounts of drug use may be even more complicated. Researchers have spent a lot of time on the adolescent age group, and significantly less research addresses emerging adults. The needs of emerging adults are unique regarding drug use patterns and rates; therefore, research is needed in order to help tailor prevention and treatment programs for this population.

The problems that impact emerging adults may differ based on what ethnic group they belong to. For instance, although African Americans make up 12% of the national population (NHSDA, 2003), they have a disproportionately higher rate of drug use as compared to other ethnicities in the same age group in the United States. Drug use and substance abuse continue to be a prevalent problem within this community. A study by the Substance Abuse and Mental Health Services Administration found that the rate of substance use among African American adolescents is roughly half that shown by their adult counterparts (Kar, 1999). Thirty percent of African American twelfth graders reported using marijuana in the last thirty days, compared to forty percent of adults. The same was true for alcohol. Only five percent of twelfth graders reported consuming five or more drinks

during one occasion, whereas over fifty percent of their adult counterparts reported consuming five or more drinks at one time (1999). Research is needed to explore why such a sharp increase is occurring in this group. The characteristics discussed make this group unique in terms of traditional prevention and treatment programs. Many factors must be taken into account when discussing this group. The experiences and life values of African Americans are unique, just as in any other culture, and combined with age, this factor may contribute to possible vulnerabilities when responding to drug use and abuse.

Research addresses many of these factors, specifically regarding whether they become protective or increase risk. Saint-Jean and Crandall (2004) report that several areas could either help or harm one's chances of using drugs, depending on how that specific aspect is perceived (Saint-Jean and Crandall, 2004). Depending on the ethnic background and age of an individual, factors that may be protective to one group may become a risk for others. Religiosity, for example, may serve as an effective protective factor in the African American community but not in the Caucasian community because of the perception and level of importance in one community versus the other (Saint-Jean and Crandall, 2004). Concurrent with this idea, it may be possible that different ethnic groups will respond to different types of treatments based on their attitudes and perceptions. In studies conducted on attitudes and perceptions regarding drug use, a strong correlation appears between the perceived risk and harmfulness of drug use and the incidence of use. As the perceived risk increases, the rate of use decreases, which indicates that those who are aware of the dangers of drug use and abuse are much more likely to decline the opportunities to engage in those behaviors (NIDA, 2003). A fuller understanding of the attitudes and practices of emerging (18-25) African American adults regarding drug use and risky behaviors is advantageous in that prevention and treatment programs may be able to better cater to this group, hence making them more effective. The purpose of this study was to investigate the health practices of African American emerging adults using a qualitative method.



Methods

Participants

Participants were selected based on age, race, and status as a college student. A total of fifteen African American emerging adults participated in this study. Participants completed this study in groups organized by gender and status as a college student, ranging in age from 18 to 25. Participants were recruited from Wichita, Kansas, a city within the Midwest, with the approximate population of 350,000 (U.S. Census, 2000). There were four groups of participants; non-college females (N=2), non-college males (N=3), college females (N=7), and college males (N=3).

Materials

Researchers used a focus group questionnaire containing nine questions for college student participants and used the same questions less one question for participants who were not of college status. The focus group facilitator used a tape recorder to document all participants' responses during the focus group. Manual notes were also taken for added clarity.

Procedure

Participants were informed of the nature of the project. Participants were asked to introduce themselves and to complete a consent form. Areas of interest to this study were limited to drug use and sexual behaviors. Participants were also included in an extended focus group that further explored topics of racial identity and opinions on current health issues facing African Americans as a group such as drug use and sexual behaviors. Dr. Lewis-Moss facilitated each focus group using the Krueger method (2001), in which students were asked to candidly give their opinions regarding the specific subject areas. An undergraduate recorder used a tape recorder in order to document participants' responses correctly and accurately. In addition, an undergraduate student researcher took notes for further clarification. The duration of the focus groups were approximately forty-five minutes. The participants were thanked for their time and the session ended. Each session included incentives to encourage active participation. A complete list of questions can be found in Table I.

Results

Results are as follows. Researchers decided to narrow the focus of the study to center around drug use and sexual behaviors. Results are described in terms of the group members participating.

Discussion

There were multiple themes seen repeatedly throughout the focus groups. Many participants in the focus groups felt a lack of support in many areas. The female college students in particular, felt there was a lack of resources to meet their needs regarding attending a university. Several of the participants reported higher levels of stress stemming from parenting issues and a lack of sufficient income. These responses demonstrated a need for community organizations to recognize this group of individuals and work towards providing assistance and support for emerging adults who struggle with a lack of resources and information. Programs could be tailored to reach out and provide services and resources to the specific needs of African American emerging adults. Further research in the area of African American emerging adults could certainly aid in accomplishing this aim. Many African Americans engage in drug use and risky behaviors and thus perpetuates the cycle of a lack of education and involvement in the system. By taking into account the voices, attitudes, and perceptions of the people we hope to reach, we may structure preventative and intervening programs that will aid this group as a whole in becoming more successful and able to achieve more in academic, financial or social arenas.

Although the adolescent population has been widely studied, few studies are available that describe the lives of emerging adults, particularly African Americans. This study sought to document the attitudes, beliefs, and health practices of African American emerging adults. Qualitative information was gathered to determine what issues African American emerging adults face and how they are most impacted by those related to drug use and sexual behaviors.



Limitations

Recruitment for this study was extremely difficult. Individuals, were very reluctant to participate, so participant numbers were low. Ideally, the total participant number would have been twenty, but only nine females and six males were successfully recruited. Some of the barriers in recruiting participants came from the sensitive subject matter and scheduling conflicts inherent in the challenge of organizing group sessions. The ability to generalize to the larger population is in turn limited because of the low participant numbers and the unbalanced gender ratio. Males were more hesitant to participate in this study than females, so there were nine females versus six males. The data may be biased because the sample is not necessarily representative. The other significant limitation in this study was the gender of the focus group facilitator. Dr. Lewis-Moss facilitated all four focus groups; it is possible that participants may have responded differently to a female as opposed to how they might respond to a male. Despite the concerns of the researcher with the possible effects of the facilitator's gender, the same facilitator was used throughout all focus group sessions to ensure continuity of responses throughout all sessions.

Future Research

Future research should focus on a much larger sample size that would incorporate multiple groups of college and non-college participants, providing a more representative overall sample of this population and incorporating those who usually do not have a voice. Future research should also incorporate multiple ethnic groups; this would add to an overall complete picture of this age group. This research would serve to identify the areas wherein needs vary between ethnicities, and to identify similarities between groups that could then be generalized in an advantageous way to increase success. Survey data could also be collected to add to the body of information collected in this study and provide current statistics regarding usage rates and other practices commonly engaged in by emerging adults.

The most important piece to this puzzle is to tailor prevention, education, and treatment

programs. The rate at which emerging adults engage in risky behaviors is alarming and therefore a problem that must be addressed. There is a dire need for change in the system that provides services or the lack thereof to this group. This group continues to engage in risky and dangerous behaviors, and effective interventions and treatment possibilities can only be reached through an increased knowledge brought about by more research.

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Table 1

Results/Responses of Focus Groups	
1. What do you think are the biggest problems facing African American emerging adults today?	
Focus Group	Responses
College Females (N=7)	"A lack of education, teen pregnancy, peer pressure, being an individual, and a lack of self-esteem and resources."
College Males (N=3)	"The system in general, the way society views us, lack of parenting."
Non-College Females (N=2)	"Money, jobs, and drugs."
Non-College Males (N=3)	"Rap music, the images."
2. Why do you think substance use/abuse is high among emerging adults and low among African American adolescents?	
College Females (N=7)	"Social issues, different environments, added stress, less supervision."
College Males (N=3)	"Young African Americans have the finances to get and do drugs, parents may be on drugs, start experimenting later in life."
Non-College Females (N=2)	"Drug use begins with younger brothers and sisters, siblings doing drugs together."
Non-College Males (N=3)	"Teens who see their parents, image thing, music, teens who cover it up and get caught as adults."
3. What role did your family play in your decision making concerning drugs and sex?	
College Females (N=7)	"My family talked about it openly, so we didn't really do it, I learned from my mom's mistakes, in our family we didn't talk about it, we didn't really talk about it in my family."
College Males (N=3)	"Everything the sex part they were willing to talk about, not that much, it wasn't something that was important to me."
Non-College Females (N=2)	"My mom told me not to, my mom and dad talked about it."
Non-College Males (N=3)	"They didn't really, my parents said I'll beat you and that was motivation for me, we never really talked openly about it."
4. What has been the biggest challenge you faced in being on your own?	
College Females (N=7)	"Being so broke, choosing what's right, time management, self readjustment."
College Males (N=3)	"Being responsible for stuff, responsibilities that you have to put up with."
Non-College Females (N=2)	"Moving my bedroom furniture, being aware of the people around me."
Non-College Males (N=3)	"Balancing my time, I'm never stressed at all, bills, kids, work."

Table 2

Questions asked of participants during the focus groups
All participants were asked eight questions:
1. What do you think are the biggest problems facing African American emerging adults today?
2. Why do you think that substance use/abuse is high among young adults and low among African American adolescents?
3. What role does/did family play in your decision making concerning drugs and sex?
4. What has been the biggest challenge you faced in being on your own?
5. How important is race to you in your life? Why or Why not?
6. What are some solutions to reduce the rate of substance use among African American emerging adults?
7. What are some solutions to reduce the rate of HIV infection among African American emerging adults?
8. Lastly, what role does having a healthy racial identity or positive thought about one's culture play on health and mental health?
The college students were asked one additional question:
9. Has being on a predominately white campus posed a problem for you? Is so why, if not why not?



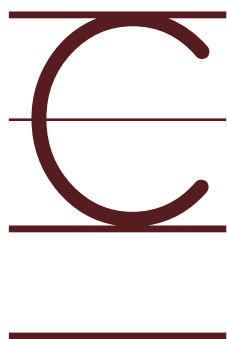
Is Treatment a Viable Alternative for Women in the Criminal Justice System?

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Substance dependency is America's, and possibly the world's, number one health and social problem, yet also the most treatable (Inaba, D.S, Cohen, W.E., 2004.) Several studies indicate treatment for substance abuse can result in long-term recovery, along with positive health benefits to the patient. However, in the early eighties, federal and state agencies, in efforts to alleviate the sale of drugs to children and youth, adopted a policy of criminalization and enforcement, devoting limited resources towards drug treatment and rehabilitation (Johns, C., 1992, Klofas, J., 1993, Weir, W., 1995 & Mauer, M., King, R., 2005.) This change in policy caused an increase of incarcerated individuals, especially women. Policies in the criminal justice system along with other social arenas have ignored the realities of gender (Bloom, B., Owen, B. & Covington, S., 2004,) and its associated issues. Women offenders, who would have been given community sanctions (such as probation, rehabilitation, restitution and community service) in past decades, are now being sentenced to prison. Twenty years ago, nearly two-thirds of women convicted of federal felonies were granted probation; in 1991, only 28% of women received straight probation (Bloom, et al). The change in the drug policy has impacted women negatively with regard to economic and social issues. Once they are incarcerated, new difficulties arise for these women, including family dissolution, declines in mental health, and often loss of child custody (Allenyne, V. 2006). The purpose of this literature review is to examine the effects of the policies of the War on Drugs on women drug offenders and the issues they face.

Wellisch et al (1994) identified several common characteristics of women drug offenders. These characteristics were taken from several sources covering women arrestees (jail, prison, diversion programs, community-based treatment facilities and drug and treatment programs.) Problems included *health, educational/vocational background,*



psycho/social issues, parenting issues, drug use and treatment issues along with these women's involvement with the criminal justice system and Child Protective Services.

Several changes evolved from the prior policies set in place to combat drug offenses. The political and social climate moved from liberal to conservative, focusing on social control. According to Baum (1996) and Gray (1998) this trend, beginning in the 1930's and resurfacing in the Nixon presidency, identified marijuana as a part of the counterculture movement posing a dangerous challenge to traditional American values. "Cultural threat" became the ideological cornerstone for a "get tough" policy to reduce the supply of drugs from other countries and to reduce domestic demand through incarceration. This, in turn, has caused a shift in how the policy is applied to women drug offenders. Women offenders, who in past decades would have been given community sanctions, now receive prison sentences (Bloom et al, 2003.) The majority of women drug offenders convicted are low-income women of color with children. Areas affected include: *housing*, where women convicted of a drug offense may be denied from obtaining housing through the Federal Housing Authority (HUD) based on the "one Strike Initiative." Also affected are areas of *Education and Employment*, as anyone convicted on a drug offense cannot secure federal financial aid. Women also found difficulty *reuniting with children* due to the Adoption and Safe Family Act of 1997 (ASFA), which mandates the termination of parental rights once a child has been in foster care for fifteen or more months for the past twenty-two months.

Andrews et al (1990) conducted a study on effective treatment for female offenders. The meta-analytic review established that successful

treatment results could be obtainable. The results indicated that the clinically relevant and psychologically informed principles of human service are a necessary foundation. Risk, need, and recidivism were identified and associated with enhanced reductions in re-offending. The bottom line is that correctional treatment of female offenders works if proper attention is given to critical factors.

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Predicting, Locating and Analyzing Late Prehistoric Settlement Configurations in the Lower Nueces River Valley, South Texas

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Introduction

Importance of a Predictive Model for Determining Settlement Patterns

In the previous eight years of research in the Lower Nueces River Valley area, there was no attempt to formulate a predictive model that might help archaeologists uncover new sites. While many sites were discovered using systematic land surveys, due to the size of the survey area, it was the belief of the author that a predictive model based on observations of settlement configurations in known sites would allow more focused surveys to be conducted, saving time and money while increasing efficiency of the surveys. In addition, surveys conducted by boat along the banks of the Nueces River yielded new quarry sites that contribute to an increased understanding of the importance of these sites to those who lived in the river valley area in the Archaic and Late Prehistoric eras. This predictive model will likely enable archaeologists throughout other Gulf Coast river valley areas to predict settlement patterns and the locations of previously undiscovered sites based on known sites and settlement structures.

Summary of Lower Nueces River Valley Survey Project

Before the summer of 2007, thirteen sites with Late Prehistoric components were identified through systematic land surveys in the Lower Nueces River Valley, South Texas, survey area (a 60 km² grid) (Drolet 2003). Ten of the sites were discovered in the northern portion of the survey area, likely due to that area being the most thoroughly surveyed. The remaining three sites identified in systematic land surveys were widely dispersed in the west, central, and southern portions of the 60 km² survey area. Eleven radiocarbon dates were obtained from charcoal samples from site 4I-SP-220 (MD-1) (a base camp in the northern portion of the survey area); ten of these dates range from AD1430-1780, all falling within the Late Prehistoric era, while Beta 183488 falls in the Archaic era (Drolet 2003 (revised 2007)).



Predictive Model For Settlement Patterns in the Lower Nueces River Valley

Quarries were an important aspect of the cultural tradition of the Archaic and Late Prehistoric inhabitants of the Lower Nueces River Valley. Prior to this survey project, research into how the locations of suitable quarries acted as a determinant in the placement of temporary (short-term occupation) and base camps (long-term occupation) had yet to be conducted. It seemed obvious upon further study of existing research into valley settlement structures that it is not only abundant faunal and botanical resources that figure into camp placement. Rather, a tool tradition based almost entirely on lithic resources required a more pragmatic view.

Location of a New Site Based on Previous Settlement Patterns

The author postulated there would be a base camp situated somewhat medially between 4I-SP-220 and 4I-NU-302 (a base camp in the southern portion of the survey area), southwest of the former and northwest of the latter. Both known base camp sites are located on low terraces between 9.1-15.2 m (35-50 ft) above the valley floor. West of the Nueces River in quadrants D1, D2, E1 and E2 are terraces and knolls that are approximately 9.1-19.8 m (35-65 ft) above the valley floor, close to possible quarry sites, groves of trees within walking distance for use in housing, tool and utensil construction, access to faunal and botanical resources, and in close

proximity to 4I-SP-220 and 4I-NU-302. A site designated locally as WW-1 was discovered in quadrant D1. Due to its size and the presence of various cultural materials, it is possible that this site was a base camp.

Results

Quarries

During the river survey, four quarries (Fig. 1) were discovered, along with four gravel deposits. Quarries were easily distinguishable from gravel deposits due to the presence of cultural materials, notably that of flakes and cores. All quarries were found on or near cut banks where severe erosion exposed various quantities of small-to-large size cobbles. Sizes of the quarries varied substantially, and it does not appear that the size of the quarry affected usage patterns; instead, cobble quality and ease of access dictated how often the quarry was used. Due to the elevation of the quarries and proximity to the river, during flooding all quarries are underwater.

Habitation Sites

During river survey, four habitation sites were discovered (JE-3, JE-5, JE-6, and JD-5), while during terrestrial survey, three sites were found (RD-9, JE-7, and WW-1) (Fig. 2). Habitation sites along the river were distinguished from quarries by the lacking gravel deposits. As with quarries, all habitation sites discovered during river survey were located in cut banks. Bank wall scraping and inspection only yielded cultural

Fig. 1. Quarries Discovered During River Survey

Site	Quad	Size	Elevation	Location (14R)	Cultural Materials	Collected Artifacts	Site Type	Period
JE-1	C3	35x4 m (140 m ²)	Floodplain (7.6 m)	E: 0617417 N: 3094681	Gravel deposit, lithic scatter	1 core, 1 secondary flake	Procurement	Archaic and/or Late Prehistoric
JE-2	C3	56.5x6 m (339 m ²)	Floodplain (7.6 m)	E: 0617101 N: 3094489	Gravel deposit, lithic scatter	2 cores, 2 primary flakes, 2 secondary flakes	Procurement	Archaic and/or Late Prehistoric
JE-4	F3	5x3 m (15 m ²)	Floodplain (7.6 m)	E: 0617462 N: 3091057	Gravel deposit, lithic scatter	2 cores	Procurement	Unknown
JD-4	G4	25x16 m (400 m ²)	Low terrace (9.1 m)	E: 0618394 N: 3090257	Gravel deposit, lithic scatter	7 cores, 6 primary flakes, 6 secondary flakes, 1 tertiary flake	Procurement	Archaic and/or Late Prehistoric



Fig. 2. Habitation Sites Discovered During River and Terrestrial Surveys

Site	Quad	Size	Elevation	Location (14R)	Cultural Materials	Collected Artifacts	Site Type	Period
				Es: 0617531,		1 biface, 3 cores, 1 preform (possibly modern), 15		
JE-3	F3	140x15 m (2100 m2)	Low terrace (10.7 m)	0617537 Ns: 3091462, 3091334	Light gravel deposit, lithic scatter	primary flakes, 32 secondary flakes, 14 tertiary flakes	Habitation	Archaic and/or Late Prehistoric
						1 Refugio pt., 1 Pandora-like pt.,		
JE-5	G3	34x10 m (340 m2)	Low terrace (9.1 m)	E: 0617551 N: 3090304	Lithic scatter	2 unidentified Archaic dart pts. 4 cores, 1 gouge,	Habitation	Archaic
JE-6	G3	40x15 m (600 m2)	Low terrace (9.1 m)	E: 0617913 N: 3090244	Lithic scatter	1 fire treated rock, 1 primary flake, 1 tertiary flake	Habitation	Archaic and/or Late Prehistoric
JD-5	G4	27x9 m (243 m2)	Low terrace (9.1 m)	E: 0618428 N: 3090376	Light gravel deposit, lithic scatter	1 knife fragment, 1 biface fragment, 3 cores, 6 secondary flakes, 1 tertiary flake, 2 fired clay nodules	Habitation	Archaic and/or Late Prehistoric
JE-7	D1	5x2 m (10 m2)	High terrace (18.3 m)	E: 0615403 N: 3093950	Lithic scatter	None	Habitation	Unknown
RD-9	D1	211x26-105 m (5,486 - 22,155 m2)	High terrace (19.8 m)	E: 0615673 N: 3093772	Lithic scatter	None	Habitation	Unknown
WW-1	D2	380x2 m (760 m2)	High terrace (19.8 m)	E: 0616283 N: 3093722	Lithic scatter, ceramics scatter	3 historic pot sherds, 3 prehistoric pot sherds, 1 Toyah Phase pot sherd	Habitation	Late Prehistoric/ Historic

materials in profile under the terraces above JE-5 and JE-6 at depths of 30-40 cm, consistent with depths of dense cultural materials excavated at sites such as 4I-SP-220. Surface inspection of terraces above the sites found during the river survey yielded no cultural materials. Sites found during terrestrial survey were located through surface inspection that yielded lithics at all three sites and ceramics at one (WW-1).

Conclusion

This research project demonstrated the importance and necessity of a settlement configuration predictive model in locating

undiscovered sites when maximum survey efficiency is essential. Combining river boat and terrestrial surveys yielded a large number of sites with Archaic, Late Prehistoric, and Historic era artifact assemblages, and also showed the importance of quarries in base and temporary camp placement. The author recommends that river and terrestrial surveys be combined with terrain feature analysis in other Gulf Coast river valleys to maximize survey efficiency, while survey efforts in the Lower Nueces River Valley continue to refine the predictive model.



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A Primatological Conundrum: Where Do We Go From Here?

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Summary

In the next twenty years, the future of free living apes is hanging precariously in the balance due to dwindling habitats and exploitation through hunting. It has been estimated that with the current rate of logging in the Congo basin and the Indonesian Islands, free living chimpanzees, gorillas and orangutans will be extinct in fifteen to fifty years. Despite the threat to free-living ape populations, the quality of life of captive apes varies greatly, ranging from adequate care to horrific treatment. Captive ape populations, especially those of the common chimpanzee (*Pan troglodytes*), have not yet received the same legal protection as other apes due to their genetic similarity to humans (*Homo sapiens*). A good question to ponder is that if chimpanzees are so genetically similar to humans that they can be used to test treatments for diseases, then what about their cognitive similarities? There have been recent scientific studies that have breached the understanding of ape cognition, emotion and culture, which has led to a public discussion regarding the current treatment of captive apes.

Due to human encroachment and excessive logging, larger ape populations in Asia and Africa have been fractured into much smaller clusters. The logging inroads into the forests have given hunters greater access to previously untouched populations, allowing the illegal bushmeat industry to flourish. Bushmeat is no longer hunted exclusively by indigenous individuals in the search for food for their families or communities. Bushmeat has become a very lucrative commercial business, and ape meat has been found recently in markets and restaurants in cities such as New York, Los Angeles, Toronto, Montreal, London, Paris, and Brussels (Gourdarzi 2007). Until individuals and corporations around the world put the environment and the world's animal species before profit, our free-living ape cousins will be gone in the next fifty years. There may not be time enough left for researchers to fully crack the code of ape cognition and culture.



Many scholars still limit culture to any species that mediates their culture through spoken language, which limits culture only to humans. Some humans, such as those in the deaf community, do not use spoken language, but gestural languages. If gestures can be used as a human language, what about the repertoire of ape gestures and behaviors?

Allan and Beatrix Gardner started Project Washoe in 1966, which was the first successful ape language study. Project Washoe has been ongoing for more than forty years and now includes three other chimpanzees that use sign language. Since Project Washoe started, there have been other language studies done with apes. A gorilla named Koko and an orangutan named Chantek were both taught to use sign language to communicate. A different approach was used with Kanzi, a bonobo chimpanzee. Kanzi was taught to use a computerized lexigram symbol board to communicate. How do the findings from the last forty years of ape language studies impact the understanding of human evolution? Dr. Roger Fouts states in his 1997 autobiography, *Next of Kin*, "Humans and chimpanzees differ in their intelligence by degree, not in the kind of mental process." These language studies have opened the door to understanding ape cognition.

The subject of ape cognition and culture and the resulting ethical dilemmas it causes in the biomedical industry has become a hotbed of scholarly and public debate. The biomedical industry may be reluctant to acknowledge the cognitive relatedness of primate species because of their need to objectify these species to find new medical treatments for the exclusive benefit of humans. Many other countries have outlawed the use of chimpanzees in biomedical research, yet the United States government has created loop-holes in the laws to sidestep the endangered species act. Many of the over one thousand chimpanzees in research labs are now infectious disease carriers and can no longer be used as models in future studies. In 2000, animal rights groups were unsuccessful in stopping biomedical research on chimpanzees in the United States, but successfully lobbied Congress for a resolution to set up sanctuaries to house these apes after

their use in research trials (Govtrack.us 2000).

Although the scientific community has a role in the survival of all wild living apes, it is up to the public to implement the changes needed to sustain these populations. The decimation of the world's tropical forests is mainly due to corporate irresponsibility (Peterson 2003). Without educating the public, primatologists will be left with only a small population of captive bred and raised apes that have a repertoire of abnormal behaviors due to compromised living conditions and lack of social interaction. While the battle is being fought to save free-living apes, it is up to the current guardians of captive populations to ensure their health and mental well-being.

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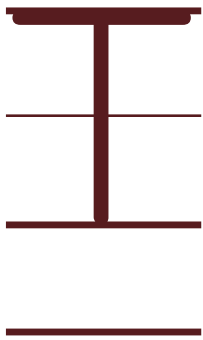
Evaluating the treatment of deaf inmates and their due process involving the 8th Amendment, the 14th Amendment, and compliance with the Americans with Disabilities Act of 1990

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Summary

The objective of this research is to evaluate the treatment of deaf inmates and their due process involving the 8th and 14th Amendments and the Americans with Disability Act of 1990. The civil rights of the deaf community are endangered through all stages of due process, because of the communication barriers that the deaf community faces and the lack of education in the hearing society. The Americans with Disabilities Act of 1990 states that all deaf persons may request an interpreter in any public forum, which includes state and federal institutions. If noncompliance occurs and the Americans with Disabilities Act is not upheld, several civil liberties are violated, such as equal rights under the law and prohibition of cruel and unusual punishment. The information obtained in this review will include a brief summary of the 8th and 14th Amendments, the Americans with Disability Act of 1990, and the process that a deaf person will likely encounter through all stages of the criminal justice system, from initial contact with the police to incarceration.

This extended literature review involves a content analysis of research conducted involving the treatment of deaf inmates. Few publications exist which involve the deaf community. The purpose of this review is to set the stage for future research that addresses the Department of Corrections' compliance with the Americans with Disabilities Act. The impact of this literature review will assist in educating the deaf community about their civil rights and the responsibility society has to uphold these civil liberties.

Understanding deafness and the proper means of communication with the deaf community can alleviate some of the problems that deaf inmates face in the criminal justice system. According to the Center for Assessment and Demographic Studies, deaf individuals tend to have poor communication skills: "Only 10 to 15% of prelingually deaf persons achieve a reading level as high as seventh grade." (Vernon,



Steinberg, & Montoya, 1999, p.508) A study conducted by Katrina Miller focuses on the linguistic diversity in a deaf prison population. This research measured the language abilities and reading scores of 97 deaf inmates in a Texas State Prison. The results of this study estimated that 50% of the 97 deaf inmates may not have received due process throughout their arrests, trials and other legal proceedings (Miller, 2004, p.118); furthermore, Miller found that it is common for the criminal justice system to incarcerate deaf defendants with linguistic incompetence (Vernon, Steinberg, & Montoya, 1999, p. 517). Linguistic incompetence involves persons with minimal language skills, restricted vocabulary in signed and spoken languages, functional illiteracy, a limited formal education, and a lack of basic life skills common to most people (Vernon, 1996 p. 121-135).

The application of this data towards deaf inmates sets the stage for understanding sign language interpretation. According to Vernon and Raifman, "there are few formal signs for most legal terms and for much of the vocabulary used in court proceedings." (Vernon, et. al., 1999, p. 505) Due to this fact in conjunction with the fact that many deaf individuals have poor communication skills, they do not truly understand what is occurring before them in a court of law (Vernon, et. al., 1999).

The Americans with Disabilities Act (ADA) has significantly affected the way in which correctional facilities must deal with inmates who are deaf and hearing impaired. Sign language interpreters for religious activities, educational programs, medical consultants, parole hearings, and mental health counseling are needed due to the ten to fifteen percent of prison inmates with hearing losses great enough to warrant speech pathology, audiology, special education, and rehabilitation services. Historically, however, there has been disagreement among corrections officials about whether the ADA applied to disabled or handicapped prison inmates. "There is ample legal precedent as exemplified by *Clarkson v. Coughlin*, the Court for the Southern District of New York found, 'that state prison officials' failure to provide interpreters or other assistive services to deaf

and hearing impaired inmates during medical treatment violated the 8th Amendment, and at least two such inmates experienced improper and harmful treatment through provision of medical treatment in absence of qualified interpreters." (*Clarkson v. Coughlin*, 898 F. Supp. 1019, 1049 (S.D.N.Y. 1995))

Currently, many prisons in the United States provide some form of health and rehabilitation services to their inmates; these services include medical, dental, and psychiatric services. Prison systems in the United States are required by law to allow for religious services, and some correctional facilities provide educational and vocational programs. Legally, these services should be available to all custodial inmates when needed, but without a qualified sign language interpreter present, the deaf inmate is locked out from all such services. The correctional systems' compliance with the ADA comes into question, because services have not been made available to deaf inmates. Additionally, some deaf inmates have been categorized as mentally disabled and treated as such, just because of the communication barriers they face.

Future research will assist in establishing comprehensive policies to provide prison officials with guidelines that focus on proper accommodations for the deaf and hearing impaired.

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Examining Website Accessibility Among the Disabled Population

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Summary

People's lives have changed dramatically as computer and internet access becomes available and more affordable. The Internet in particular holds great promise for individuals with disabilities. The World Wide Web (WWW), allows people with disabilities to communicate globally, work at home during flexible hours, shop at their convenience and retrieve information that was not easily accessible to them before. However, because the Web is a vast and unrestricted space, it also presents barriers to persons with varying disabilities. For example, blinking or flashing features can trigger seizures in people with epilepsy, and words in multiple tables or columns can cause problems for blind people because text-to-voice readers ignore column breaks and only scan across screen (Sarnoff, 2001).

The term 'accessibility' pertaining to a website means that including people with disabilities, almost everyone will have equal access to the same information on the website (Hackett, Parmanto, and Zeng, 2005). However, not many websites are accessible today. Experts estimate that "fully 98% of current websites reported inaccessible to people with disabilities that prevent them from using the full range of website design features" (Sarnoff, 2001). Several studies have found that websites that were health-related, devoted to disability issues, or under government regulation were also inaccessible to disabled people (Parmanto and Zeng, 2004; Olsen, 2000; West, 2001). Moreover, those websites devoted to disability issues are not doing much better. In one study, of 200 websites devoted to disability issues, 65% were inaccessible to people with disabilities (Olsen, 2000). Another study found that of the 108 consumer health-related websites examined, none were completely accessible to people with disabilities (Parmanto and Zeng, 2004).

In the past, most Internet-related studies have mainly focused on the general Internet users' online experience, excluding those with disabilities. Thus, this is an



explorative two-phase study that focuses on people with disabilities. The first phase addresses three important issues: general Internet usage and preferences of web users with disabilities, the knowledge that people with disabilities have about Sec. 508 under the Rehabilitation Act and the overall perception that people with disabilities have regarding government (.gov), education (.edu), and other websites (.com, .net, etc.). The second phase of the study focuses on web users with learning and/or cognitive disabilities and involves examining the performance and preference of those web users on two travel websites. Additionally, the second phase addresses the important issue of whether a “hover on paragraph feature” (wherein a specific paragraph on a website is highlighted as the mouse moves over it) is an important website feature for people with cognitive disabilities and learning difficulties.

First Phase

Nineteen (9 males, 11 females) college students, ages 18–52 with various disabilities from the Wichita State University (WSU) population volunteered to participate in the first phase of this study. Participants were asked to complete a seven-page survey regarding participant’s Internet usage and experience. The major findings of this study can be summarized as follows: The majority of participants own a computer at home with Internet access and are active on the web. The most commonly used Operating System (OS) and web browser for those participants are Microsoft Windows and Internet Explorer.

Furthermore, e-mailing, searching, and reading online news are the top three activities participants are likely to engage in on the Internet. The top three problems participants are likely to report when viewing websites are unwanted popups and advertisements, poor layout design, and the lack of navigational guide. Overall, participants gave more favorable accessibility ratings (in terms of font choices, color choices, and organization of layout) to government and education websites than other non-government and non-education websites (See Appendix A, Table 1 for more details). Finally, 18 of the participants were not familiar

with Sec. 508, the law passed by Congress mandating that all federal agencies give disabled employees and members of the public equal access to the same information (U.S. General Services Administration, n.d.). This suggests that people with disabilities might not be fully aware of the laws passed by government to protect their rights, and thus might not take actions to force inaccessible federal agency websites to comply with web accessibility standards.

Second Phase

Six (1 male, 5 females) college students, ages 19–56 ($M = 38.00$) with learning and/or cognitive disabilities were recruited from the Wichita State University (WSU) population to participate in the second phase of this study. All participants were asked to navigate two travel websites (Hawaii Travel and Thailand Travel) and complete four search and retrieval tasks per set of tasks (2 sets of tasks in total) relating to each website. Only one of the two travel websites had the hover on paragraph feature. None of the participants were informed about the hover on paragraph feature. To avoid ordering effect, each set of task were randomly shuffled before given to participants and participants were asked to complete the tasks in the order they received them. After each task, participants were asked to rate the difficulty of the task on a 5-point Likert-type scale (1 = very easy; 5 = very difficult). Additionally, all participants were asked to complete Pre-Task, Post-Task and Post-Test Questionnaires.

The major findings of the second phase revealed that there might be an inconsistency in terms of assigning similar difficulty levels among the tasks between the Hawaii and Thailand websites, and that the Hawaii website tasks appeared to be the more difficult set of tasks (See Appendix B, Table 2 for more details). Additionally, participants gave the Hawaii website higher ratings in terms of a more professional look, being more difficult to read and finding information, and stated that most people would learn to use the Hawaii website more quickly than the Thailand website. On the other hand, the Thailand website received higher ratings in terms



of participants feeling more confident when using the website, having more annoying features, and feeling the need to learn more things before they could proceed productively with this type of website.

Lastly, results were split when participants were asked to select between the two websites (Hawaii and Thailand). Results also show that 83% of the participants ($n = 5$) preferred websites that did not have the hover on paragraph feature. Furthermore, only two participants seemed to notice the hover on paragraph feature enough to mention it in the questionnaires. Interestingly enough, the participants who did notice the hover on paragraph feature listed the feature as the thing they least liked on the websites. This suggests that the hover on paragraph feature may not be an important aspect on a website for people with learning and/or cognitive disabilities. Perhaps the feature would be more useful and less of a hindrance if it could be modified to give web users the option of turning it on or off by clicking a button on a website.

Conclusion

In summary, it is difficult to generalize the findings of this two-phase study to the rest of the disabled population. First, both experiments were based on a convenience sample and not a representative sample. Thus, the results are likely to reflect only the disabled population who attend college at WSU. Specifically, for the first phase, the survey only measured what participants felt at the time, and thus the results for the website ratings portion might be entirely different if the survey were given at another time. In addition, results from the second phase indicated that the sets of tasks for each website were not similar to each other in the level of ease/difficulty. This in turn could result in some people preferring to navigate the Thailand website over the Hawaii website. Most importantly, it is difficult to conclude any findings with confidence when the results of both phases are based on a small sample ($N = 19, 6$).

Future research might want to replicate this study using a larger and more representative sample size to confirm the results from this study or to

provide new findings. Other researchers might want to focus on studying the individual online experience in order to see the differences and similarities between various types of disabilities. Finally, more experimental studies regarding the types of fonts, color choices, and layout designs that people with disabilities prefer will be helpful for webmasters and web designers when designing and/or maintaining an accessible website.

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Appendix A: First Phase Result

Table 1

Accessibility Ratings of Government, Education, and Other Websites

	Fonts	Colors	Organization	Overall Accessibility
Type of Website	M (SD)	M (SD)	M (SD)	M (SD)
Government (.gov)	3.74 (1.10)	3.45 (.84)	3.42 (1.07)	3.68 (.95)
Education (.edu)	3.79 (1.03)	3.68 (1.16)	3.58 (1.07)	3.63 (.90)
Other (.com)	3.21 (1.08)	3.32 (.95)	3.26 (.93)	3.58 (.96)

Note. Participants were asked to rate government, education, and other websites on a 5-point Likert-type scale (1 = very poor; 5 = very good) in terms of the font visibility, color choice, organization, and overall accessibility of those websites.

Appendix B: Second Phase Result

Table 2

Egrobrowser Data: Average Time, Pages and Clicks to Complete Each Task

	Hawaii Websites			Thailand Websites		
	Time	Pages	Clicks	Time	Pages	Clicks
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Task 1	34.9 (17.5)	3.2 (1.3)	3.6 (1.1)	54.1 (55.5)	3.2 (1.8)	3.4 (1.7)
Task 2	183.7 (43.5)	11.4 (6.4)	12.6 (5.8)	80.5 (73.4)	6.0 (5.2)	6.8 (5.4)
Task 3	21.0 (10.3)	2.2 (.5)	2.4 (.6)	36.5 (23.8)	2.6 (.6)	2.8 (.8)
Task 4	79.1 (47.8)	5.2 (3.5)	5.6 (3.1)	63.8 (45.4)	4.4 (1.9)	4.6 (2.2)



Assessing the Behaviors, Attitudes and Perceptions of Men Who Have Sex with Men Regarding HIV/AIDS

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Summary

Since the onset of the HIV/AIDS epidemic in the United States, men who have sex with men (MSM) have been affected at disproportionate rates. In 2005, MSM accounted for 71% of all estimated HIV infections among adult men and adolescents (Center for Disease Control and Prevention, 2007). This is alarming news, considering that only five to seven percent of adult males and adolescents identify themselves as MSM (Center for Disease Control and Prevention, 2007).

MSM account for over half of all people who have ever been diagnosed with AIDS, as well as over half of the people who are now living with or who have died from AIDS (Center for Disease Control and Prevention, 2006). Racial disparities are also present regarding HIV/AIDS infection among men who have sex with men. According to the CDC, in 2003, rates of new HIV/AIDS infections suggest that approximately 63% were among men who were infected through sexual contact with other men. Of these men, 50% were African-American, 32% Caucasian, and 16% Hispanic (Center for Disease Control and Prevention, 2006).

There are several reasons for high HIV/AIDS rates in MSM, including sexual risk factors, substance use, complacency about risk, unknown HIV sero-status, MSM who are HIV-positive, the internet, social discrimination and cultural issues, lack of communication and risk assessment, and concurrent psychological problems (Centers for Disease Control and Prevention, 2006).

The purpose of this study is to assess the behaviors, attitudes and perceptions of MSM living in the Midwest to determine what factors are putting them at risk for HIV/AIDS infection. Assessing the different risk and protective factors among HIV+ and HIV- men of diverse backgrounds is important in discovering why HIV/AIDS infection remains high for MSM in the Midwest (Center for Disease Control and Prevention, 2006).



Hypotheses

1. It is hypothesized that participants will have low self-esteem.
 - African-American participants will have lower self-esteem than Caucasian participants.
 - Hispanic/Latino participants will have lower self-esteem than Caucasian participants.
 - HIV+ participants will have lower self-esteem than HIV- participants.
2. It is hypothesized that more HIV+ participants will have injected or used illegal drugs than HIV- participants.
3. It is hypothesized that the majority of participants would agree that the negative aspects of HIV/AIDS have decreased since advancement in HIV/AIDS medication has become available.
 - More HIV+ participants would agree that the negative aspects of HIV/AIDS have decreased since advancement in HIV/AIDS medications has become available.
4. It is hypothesized that no participants would have had unprotected anal intercourse with a man that is HIV+ with the intent of becoming HIV+.
5. It is hypothesized that the majority of participants had engaged in a risky sexual behavior at least once in the past year.

Fifty MSM participated in this study. Forty percent identified themselves as Caucasian, 32% Black/African American, 8% Hispanic, and 20% were other groups. Of the participants surveyed, 52% were HIV-, 38% HIV+ and 10% were unsure of their HIV/AIDS status. Participants were recruited at a local HIV/AIDS serving organization and Wichita State University's "That Gay Group." Participants completed a forty-five-question survey that consisted of questions that assessed demographics, health, perceptions of HIV/AIDS, social support, knowledge, risky sexual behavior, HIV/AIDS status, and relationships. The survey took approximately 10 minutes to complete and participants were debriefed after completion.

The results indicated that 86% of participants had high self-esteem. Surprisingly, 100% of Hispanic/Latino participants had high self-

esteem, while the African-American and Caucasian participants showed similar percentages at 88% and 86% respectively. HIV-(88%) and HIV+ (84%) also had similar self-esteem percentages. Thus, HIV status or race/ethnicity does not appear to interfere with self-esteem.

Regarding participants who reported use or injection of illegal drugs, the results show similar responses between HIV+ (89%) and HIV- (92%) participants who had not used or injected illegal drugs. Thus, these findings did not support the hypothesis that participants who were HIV+ would use or inject illegal drugs more than those who were HIV-.

It was hypothesized that the majority of participants would agree with the statement that the negative aspects of HIV/AIDS have decreased since advancement in HIV/ADS medication. The results showed that 42% agreed with the statement. This indicates a dangerous belief, because there is still no cure for HIV/AIDS. Surprisingly, more HIV- (42%) than HIV+ (36%) responded true. Sixty percent of participants who were unsure of their HIV status responded that they agreed with the statement.

Results

The results for the question, "I have had unprotected anal intercourse with a man that is HIV+ with the intent of becoming HIV+", showed that 94% responded they had not had intercourse with a man that is HIV+ with the intention of becoming positive. After further examination of the HIV/AIDS status of participants, 16% of HIV+ participants responded yes they did have sex with a man that was HIV + with the intention of becoming HIV+. The hypothesis that no participants would have had sex with a man that is HIV+ with the intent of becoming HIV+ was disproved for the sample in this study.

Unprotected anal intercourse is the leading risk factor for HIV/AIDS in MSM. The results showed that the majority, 60%, had not engaged in risky sexual behavior; thus our hypothesis was not confirmed. The hypothesis that the majority of participants had engaged in a risky sexual behavior at least once in the past year was not true for the participants in this study.



In conclusion, this research dispelled many myths about MSM. First, the belief that gay men have low self-esteem was not confirmed in this study, because this population reported feeling good about themselves. Second, the majority of participants, regardless of HIV status, did not use or inject drugs. Third, 42% of participants agreed with the statement that the negative aspects of HIV/AIDS have decreased since advancement in HIV/ADS medication; thus it can be concluded that more education needs to be conducted regarding this issue, to alert MSM in this area. Fourth, the majority of participants, in spite of HIV/AIDS status, did not have unprotected anal intercourse with a man who was HIV+ with the intent of becoming HIV+. However, 16% of HIV+ participants responded they did have unprotected anal intercourse with a man who was HIV+, which suggests that there is a greater need to recognize the fact that some men are intentionally being infected with HIV/AIDS. Fifth, most participants had not engaged in unprotected anal intercourse in the past year.

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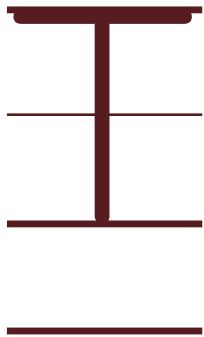
Investigation of Sexual Dimorphism in the Human Sternum for Use in Forensic Anthropology

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Summary

To date, there have been many studies regarding the sexual dimorphism of the sternum. In the American Journal of Physical Anthropology, Stewart and McCormick published the most referenced study in 1983. This study measured the sternal length and ossification of sternal rib ends. Their study returned an 80% predictive accuracy, using both sternal measurements as well as ossification of sternal ribs ends. A study done by Jit et al. (1980:217), using measurements designed by Ashley (1956), showed similar results, but their study only measured the length and width to analyze sexual dimorphism. The xiphoid process can be one to four small bones; this is the thinnest piece of the sternum and the least developed. This part of the sternum is cartilaginous in early life, but ossifies with age. Old age brings total ossification and fusion with the body to the sternum. Stewart and McCormick (1983:220) stated that the range of sternal length was greater in cadavers found in the United States than those reported by Jit from northern India.

The first study published by Jit, Jhingan and Kulkarni, *Sexing the Human Sternum* published in the American Journal of Physical Anthropology in 1980. The methods and materials of this study are as follows: total of 400 sterna (312 male and 88 female) all of age 18 or older, the sternum was removed whole from the cadavers with only a few centimeters of attached costal cartilages. Jit states that the combined length of the mesosternum and manubrium, if above 140 mm or below 131 mm that they were correctly sexed as male and female respectively. The second study published by McCormick, Stewart, and Langford called *Sex Determination From Chest Plate Roentgenograms* published in the American Journal of Physical Anthropology in 1985. The methods and materials are as follows, the chest plate consisting of an intact sternum, costal cartilages, sternal rib ends, and associated soft tissues. The results from this study states that using the ossification pattern alone there was 92% accuracy in sex



determination. Sternal length alone produced 94% accuracy in sex determination, totaling 761 of the 1133 sternae studied. This study did show that there is some sexual dimorphism in the human sternum.

In 2002, another study on the sexing of the sternum conducted by: Daphale, Baheete, and Kamkhedar, titled *Sexing the Human Sternum in Marathwada Region* was published in the *Journal of the Anatomical Society of India*. The methods and materials are as follows; the study consisted of 143 sterna, 96 male and 47 female. The results of the study state that the combined measurement of the manubrium and the mesosternum are useful in determining sex. However, the "other" measurements are not as useful; the same is stated in Jit et al. (1980). Chest plates were removed from only cadavers over the age of 15. The sterna were then dried at room temperature. Sternae showing deformation, disease, or fractures were not included in this study. For age estimation sterna was examined in pieces, i.e. manubrium, body and xiphoid process were examined for the amount of fusion present. For sexing the sternum, the length and width of the manubrium and body was measured. The conclusion of the study gives no percentage of accuracy for sex determination. However, it does give an index of measurements for males and females.

In conclusion, each of the preceding studies measured combined length of the manubrium and mesosternum, with varying degrees of success in sex determination. There is certainly more to be done regarding the study of this particular bone. All of these authors have worked to find the answer to the question, "Can the sternum be a reliable tool for sex determination?" and the answer is yes. The measurements used by Jit et al (1980) and Ashley (59) is the same that will likely be used in future studies. These are reliable measurements, but why not add to the foundation? The degree of success will be higher if there is another study done, with a variance on the measurements used. The accuracy of sex determination could be increased with a three-dimensional set of measurements. Thus enabling the forensic anthropologists and medical examiners another route to identifying recovered cadavers.

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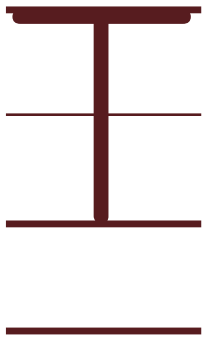
Singing Taught Using A Computer Program that Displays Pitch of Tone and Vowels Through Shapes and Colors

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Summary

his research seeks to create a tool for teachers who teach voice using a computer program to respond to pitch and vowel sounds by producing colors and shapes. Such visualization of pitch and vowel can serve as immediate feedback to the student as he/she seeks to sing in tune with a purer vowel. As the student sings, the pitch and vowel are displayed in the forms of shapes and colors on the screen. Research for this project will include reading primary sources in speech, vocal pedagogy, and seismic data. The primary step in this project will focus on the research aspect of this program, and the secondary step will consist of building the computer program. The primary step includes an extensive review of similar and relevant literature and programs. For the purpose of the primary step, only the vowel AH will be used on an 8 note scale—one octave from middle C.

Many sources were used that stemmed the idea of the proposed program. On the DVD *Beautiful Singing: Not Just For the Chosen*, Dr. Clayne W. Robison demonstrates an innovative and relevant technique of teaching voice. Not only does he correct posture, breathing habits, and head/chest positions, but he also video tapes his students before and after these corrections. Such readily available visualization quickened their perceptions of good singing habits. This technique allows the singer to distinguish between the vowel A or U. Not only would this be useful in the classroom, but also for individual use. The visual learning aspect of Robison's method for good singing is the foundation of the proposed program.

Speech is defined as the communication or expression of thoughts in spoken words, and singing is defined as the production of musical tones with musical inflections and modulations by means of the voice, thus giving speech and singing a similarity regarding sound waves. In William Vennard's study of the mechanism and techniques of singing, he breaks down the science of irregular sound waves that



are called noise, and shows that “if these waves form a pattern that repeats itself regularly, it is musical tone...[thus] the tones are called vowels, and the noises, constants” (2). Vennard also states that musical tone has five essential properties: pitch, duration, intensity, timbre, and sonance, and each can be measured and studied scientifically (2). Specifically, Vennard’s discussion of pitch is relevant to this project. Vennard used the measurement of pitch, measured with a sonograph, to interpret a visual technique of how the voice works. The proposed computer program will expand on the sonograph machine. This extension of Vennard’s technique is the primary step in identifying how to simplify this machinery and science into a visual computer program.

Another source shows a more advanced study of the sonograph. A. H. Balch reveals in his article “Color Sonagrams: A New Dimension in Seismic Data Interpretation” that a computer-graphic-photographic system has been developed that uses color to interpret different frequencies. This data will help develop pitch frequencies into shapes and colors for the proposed program.

Many literature resources were reviewed and studied, but the most helpful information is from an image synth. This program can create and manipulate images and generate sound from those images. If the proposed program uses sounds to create shapes and colors, then it would be doing exactly what the image synth does, but backwards.

In conclusion, this proposed program will be an incredible asset to the voice teacher as well as the voice student. It will help a person visually understand his/her musical tone, and actually see the mistakes made, making it easier to correct them. It is shown that the most research conducted on this subject stopped with

the sonograph with some advancement to an image synth, colorful wave lines of frequencies. Continued research in this area will improve the likelihood of advancement to the next level, going beyond previous researchers to help future generations achieve satisfactory pitch and tone.

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