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<b>Authors</b>	<b>Page</b>	<b>Articles</b>
Alyson Boppel	3	The Effects of Callosotomies on Epileptics
Kelley M. Barrett	6	Biofeedback and Biofeedback-Assisted Relaxation on Diabetes Mellitus
Amy Cope	12	Antisocial Behavior in Children
Julie A. Adkins	17	Race as a Predictor of Body Image Satisfaction and Body-Size Preference in Female College Students
Ed Holder	22	A Review of Workspace Personalization
Kristi Rogers	27	A Closer Look at Personality Characteristics of Smokers and Non-Smokers in College Students

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# The Effects of Callosotomies On Epileptics

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*The treatment of epilepsy has led to extensive research within the medical community. Due to the severity of the seizure activity that some individuals experience, treatment has become a controversial and ethical issue. In cases where the severity of the seizures cannot be reduced by drug therapy, the callosotomy has become a useful alternative. However, this surgery involves the severing of the corpus callosum which inevitably causes the integration of information between the two hemispheres to relinquish. Processes of this information within the realms of vision and audition are compromised to some extent. The consequences require commissurotomy patients to live their lives in a way that is often difficult to adapt. The callosotomy does, however, succeed in reducing the occurrence of epileptic seizure by localizing activity to one hemisphere.*

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## INTRODUCTION

### A Closer Look at Epilepsy and Seizures

Even with the great advancements that the medical community has made over the past few decades, the cures to some disorders remain unknown. One of these disorders, which continues to baffle experts is epilepsy. Epilepsy, defined by seizures, is the result of brain cells which fire at often random and unusual stimuli (Asimov, 1964). Stressful situations such as sleep deprivation and exhaustion are the most common causes of seizures for epileptics. Other triggering stimuli may include flashing lights, extensive reading or laughing, drugs including alcohol, and even the fluctuation of hormone levels within the body. Nonetheless, the etiology of all seizures remains a mystery (Banich, 1997). These giant hyperpolarizations can transpire in any number of areas of the brain depending on the type of seizure that it is. For example, Jacksonian seizures are characterized in a systematic fashion in which the firing moves along the motor cortex. This can easily be observed as the tremors travel throughout the body, originating in one area and shifting to others (Banich, 1997). The activity and intensity levels of epileptic seizures vary among individuals and therefore cannot be described in absolute terms. In fact, sensory areas of the brain are also subject to other types of seizures. These disturbing lapses cause individuals to experience muscle contractions, loss of muscular coordination, and loss of balance (Asimov, 1964). Due to the uncontrollable and unpredictable nature of seizures, it was not uncommon for people of the preceding centuries to believe that an epileptic's body was momentarily taken over by supernatural beings (Asimov, 1964).

A "grand mal" seizure, often referred to as a "tonic-clonic" seizure, is characterized by a loss of consciousness followed by rhythmic jerking of body parts which continues for minutes (Banich, 1997). When this type of seizure occurs over a long duration of time, the epileptic's body temperature will rise and may eventually cause the heart, lungs, and kidneys to cease functioning (McGowen, 1989). These fits are not only frightening, but may also render a situation of much danger. Suppose that person is driving or even walking across a busy intersection. Even a few seconds will place an individual at a tremendous amount of risk. It is possible for a severe epileptic to experience hundreds of seizure throughout a day. In order to increase the quality of life and at the same time curtail some of the difficulties that they must encounter, the callosotomy has become an efficacious form of treatment.

### The Callosotomy as an Alternative

The callosotomy is a surgical procedure that involves the severing of the corpus callosum. The corpus callosum is the most massive system of commissural fibers within the brain (Beatty, 1995). It connects the right and left hemispheres and is responsible for the communication passage between them. It is also the pathway through which the firing neurons, during an epileptic seizure, follow. This information alone has augmented curiosity concerning the implications of cutting the corpus callosum in epileptics. Such a procedure is referred to as either a partial or full callosotomy, depending on how much of the corpus callosum is cut. The goal of the callosotomy is to restrict the seizure to one of the hemispheres (Smith, 1984). The seizure activity, in fact, is localized and contained, allowing the other hemisphere to maintain normative bodily functions (Gazzaniga, 1970). When the neurons are unable to communicate between the fibers of the corpus callosum, this is accomplished. The callosotomy is not a treatment available to all epileptics. It is, however, a final resort that is available to patients for whom drug therapy fails. For example, anticonvulsant medication such as diphenylhydantoin and phenobarbital are the most common remedies used to treat epilepsy. In order to reduce the seizure activity for some severe epileptics, the dosage must be so high that the side effects become more of an impediment, causing excessive drowsiness, hyperactivity, and cognition dysfunction (Banich, 1997). Even at this, the patients must receive extensive medical and neurologic testing before operation is considered (Gazzaniga, 1970). It is then, for certain patients, that the callosotomy has proven to be an advantageous alternative.

### **The Role of the Corpus Callosum in Callosotomies**

The association made between the corpus callosum and the integration of information between the hemispheres was made accessible via the contributions of several early scientists. One of the first breakthroughs, in 1887, was made when a man suddenly discovered that he could no longer read letters, words, or music notation, yet he showed no signs of intellectual disturbance. He could write but not read what he wrote (Kitterle, 1995). An autopsy performed after his death revealed that a lesion that had destroyed the splenium of his corpus callosum. Furthermore, observations of patients with convulsive seizures and callosal injuries showed that the more damage a corpus callosum sustained, the less frequent seizures occurred (Kitterle, 1995). In 1939, there was a tremendous breakthrough in the medical community when scientists Van Wagenen and Herren conducted the first partial callosotomy on an epileptic patient for whom conventional therapy had failed (Kitterle, 1995). These patients, today referred to as 'split-brain patients', are required to make enormous adjustments within the realms of their physical, psychological, and social lives.

The severing of the corpus callosum leads to what some ascribe to as a Siamese mentality. When the nerve bundle is cut, it leaves two spheres of consciousness connected to one brain stem (Smith, 1984). Such a phenomenon can be compared to a head containing two minds, a left and a right. Several tests have been performed in order to assess the degree of change that a commissurotomy experiences as a result of the surgery. When a familiar object, such as a ball, is placed within the left visual field of a post-surgical epileptic, only the right hemisphere receives that information due to contralateral projection of information within the brain. The left hemisphere, responsible for speech and language, would receive no information. If that person were then asked to reach into a bag and retrieve the object that they had just seen, they would correctly do so. But, on the other hand, if they were asked what they had just retrieved, they would reply "nothing" (Smith, 1984). This obscure scenario is the consequence of insufficient communication between the two halves of the brain. Without the corpus callosum to transmit signals between the two hemispheres, a high potential for confusion in performing everyday tasks manifests.

The two halves seem, at times, to have a "mind" of their own. For example, when testing a commissurotomy's ability to discriminate between two stimuli, each presented in a different visual field, they are unable. A red spot presented in the left visual field at the same time as a blue spot in the right visual field would not cause these patients to acknowledge them as different colors. The same goes for different shapes (Gazzaniga, 1970). As for auditory functioning, when split-brain patients are verbally presented with six digits, three in each ear, they are unable to report the three from the left ear as accurately. The data from dichotic stimulation tests, such as this one, suggest that crossed auditory pathways are more

dominant than ipsilateral projections (Gazzaniga, 1970). The severed corpus callosum does not allow contralateral projections to occur. Other examples of the “contradicting brain” behavior includes a man pulling his pants down with one hand and up with the other (Smith, 1984). Another reported incident involves a man who started to strangle his wife with one hand and protect her with the other (Smith, 1984).

### **An Overview of the Literature**

The bizarre behavior which occurs as a function of the callosotomy is still under study. The disconnection of hemispheres has led to many discoveries concerning the purpose of each hemisphere and to the integration of information provided by the corpus callosum. It is important to keep in mind that the callosotomy is not a cure for epilepsy, but a relief to some of the ailments that occur along with it. It is used on patients for whom medication offers no alleviation of seizures. The number of seizures is reported by severe epileptic patients to rapidly decrease after surgery. Although some of the effects prove to be somewhat disturbing and inconvenient, it can, in no way, be compared to the frightening and unpredictable experiences felt by epileptics from ongoing seizures. This surgery, the callosotomy, is an alternative to the disabling repercussions that epileptics are unable to escape in order to live as normal, happy, and healthy as possible.

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# Biofeedback and Biofeedback-Assisted Relaxation on Diabetes Mellitus

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*The use of biofeedback, particularly relaxation training and temperature training, is examined as a method for helping patients with both insulin dependent and non-insulin dependent diabetes gain greater control over blood glucose levels. Research shows that in many instances individuals improve at estimating their own blood glucose levels after such training although in many other cases no significant effects are obtained. Suggestions for future research are made.*

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## INTRODUCTION

Diabetes mellitus is a chronic autoimmune disease in which either the secretion of insulin from the pancreas, or the action of the insulin in carbohydrate metabolism is defective. Insulin is crucial to the human body due to its action in metabolism, which provides our bodies with energy. Cell membranes are made permeable to glucose by insulin, so that the glucose may enter the cell. Without the presence of insulin to permeate the cell wall, the glucose builds up in the bloodstream. The cells then began to metabolize the body's natural reserves (such as fats and proteins). This depletion of energy reserves causes symptoms such as fatigue and weight loss, and may even lead to death. This condition is known as hyperglycemia, due to the increase of glucose in the blood (Surwit, Feinglos, & Scovern, 1983). The opposite of this, hypoglycemia, is due to a decrease of glucose in the blood. Patients experiencing a hypoglycemic reaction often report dizziness, tremors, and nausea.

There are two kinds of diabetes characterized by the type of deficiency the patient exhibits. If the patient produces very little insulin from their beta cells in the pancreas, or is unable to produce insulin at all, it is referred to as Type 1; insulin-dependent diabetes (IDD) or juvenile diabetes (due to the fact that the onset of this particular type is often in early adolescence). Type 2, non-insulin-dependent diabetes (NIDD) or adult-onset diabetes, is commonly associated with obesity. In this type of diabetes, the patient does not have any deficiencies in beta cell function, but is simply unable to produce enough insulin to meet their body's needs (Surwit, Feinglos, & Scovern, 1983). These are the traditional classifications of diabetes, however, it should be noted that occasionally researchers, and/or physicians will refer to insulin-dependent diabetes as type 2, and non-insulin-dependent diabetes as type 1. These few exceptions will be so noted within the article.

Approximately ten million Americans are afflicted with diabetes, and the vast majority of these are cases of non-insulin-dependency (Turkat, 1982). However, focus is placed on insulin-dependent diabetics due to the severity, and potentially debilitating effects of this type of diabetes. There is no cure for diabetes, and many possible complications may arise due to the disease such as cardiovascular disease, retinopathy, neuropathy, and nephropathy. These complications make diabetes mellitus the third leading cause of death in the United States (Surwit, Feinglos, & Scovern, 1983).

Unfortunately for diabetic patients, there has not been much choice in terms of treatment. Insulin-dependent diabetics must have regularly prescribed and carefully measured units of insulin directly injected into their bodies to avoid hyperglycemic, as well as hypoglycemic, reactions. Non-insulin-dependent diabetics must regulate their diets in order to control blood glucose levels (BGL). Physical exercise has also been found to aid in the regulation of diabetes (Turkat, 1982). Sometimes oral medications are used with more severe cases of non-insulin-dependent diabetes, though patients rarely progress to the use of direct insulin injections. These types of treatments for diabetic patients are referred to as an endocrinological perspective, due to the placement of focus on the endocrine system.

Recently new perspectives have emerged in the treatment of diabetes. Among the first of these was the psychosomatic perspective. The basic premise of this perspective being that specific disorders are developed by those individuals possessing specific personality traits (Surwit, Feinglos, & Scovern, 1983). The downfall of this perspective was in the assumption that if a disease is developed from a personality trait, then it is the personality trait, rather than the disease, that should be treated. Therefore, the primary focus was placed on psychotherapy to change the undesirable personality traits that caused the development of the disease (Surwit, Feinglos, & Scovern, 1983). Although the psychosomatic perspective generally has failed, it did contribute valuable notions which have resurfaced within the behavioral perspective as supplements to biofeedback.

The behavioral perspective, however, has had some very promising, and mixed, results for many patients. These results have sparked an interest both from the medical professionals, and from psychologists. This perspective grew from the acceptance that behavior indeed has an impact on diabetes, but the influence has been documented since the seventeenth century (Surwit, Feinglos, & Scovern, 1983). From this perspective grew the use of biofeedback, and biofeedback-assisted relaxation techniques for the control and alternative treatment of diabetes mellitus. The effects of these treatments will be reviewed and discussed in various controlled experiments. Experiments provide perhaps the most insightful and valuable information on any topic. Without these controlled studies, researchers could never be sure why it is their results reveal what they do. The ability to eliminate extraneous variables guarantees the researcher that the work is both valid and reliable. Below is a brief review of five experiments of type 1 diabetics, three experiments of type 2 diabetics, and one experiment involving both.

McGrady, Bailey, & Good (1991) studied the effects of biofeedback-assisted relaxation on BGL of 19 subjects with IDD. All subjects were assessed by a certified biofeedback therapist, and interviewed by a clinical nurse, before being randomly assigned to either a treatment group, or a control group. The experimental group consisted of ten subjects, and the control group eight. There was no mention as to which group the nineteenth subject was initially placed.

Treatment consisted of ten sessions, one each week. Biofeedback-assisted relaxation was used for 20-30 minutes in each session. One or two sessions involved progressive relaxation, and the remaining involved autogenic training. EMG feedback was used for half of the sessions, and thermal feedback was used in the other half for each of the subjects in the experimental group. These subjects also received 15-30 minute sessions with the clinical nurse following their biofeedback, and were instructed to practice relaxation at home once a day. BGL were monitored, and insulin dosages were recorded. The control group received no biofeedback-assisted relaxation. They attended weekly sessions with the clinical nurse, monitored their BGL, and recorded insulin dosages.

Three different measures of blood glucose were used in order to establish whether or not treatment was successful. Indeed, all three measures showed statistically significant changes in the BGL of the experimental group, and no significant changes in the control group. Further, all of the differences between the two groups was found to be statistically significant. Therefore, treatment was deemed successful. As a further note of interest, all of the subjects participating in the control group were offered biofeedback-assisted relaxation at the termination of their participation in the study. All of the subjects accepted.

Guthrie, Sargent, Speelman, & Parks (1990) studied the effects of parental relaxation training on the glycemic control of their children with IDDM. Twenty families identified as highly stressed were chosen to participate in the study. Subjects were alternately assigned to a control group, or an experimental group, with ten subjects in each group.

Treatment consisted of thermal and EMG biofeedback for 20 minutes over a ten week period. Electrodes from the biofeedback equipment were placed on the control subjects, however they received no feedback. A baseline was established in a 20 minute session. Experimental subjects reported BGL and log sheets from daily practice at each session. Control subjects reported only BGL.

Only nine subjects in the experimental group, and three subjects in the control group completed the study. Results are based on those subjects that successfully completed the study. A statistically significant

difference was found in the pre- and post-test glycosylated hemoglobin levels in the experimental group. There was also an increase in temperature in the experimental group. Therefore, it appears as if parental relaxation training did have a positive effect on their children's glycemic control by reducing stress factors throughout the entire family.

However, the dramatic decrease in subject participation in both groups, but particularly for the control group, may have altered the results. Therefore, further research needs to be conducted in order to replicate these results. Yet this appears to be an interesting new direction for the treatment of diabetes. The suggestion that the diagnosis of IDDM affects the entire family, leads researchers to believe that stress reducing techniques and therapy should be provided for all family members.

Cox, Carter, Gonder-Frederick, Clarke, & Pohl (1988) studied the effects of blood glucose discrimination training on BGL estimations in insulin-dependent diabetics. The article reports two independent studies. Study I included 20 subjects, ten in the control group, and ten in the experimental group. Before treatment began, subjects reported estimates of their BGL both in a hospital setting, and in their home settings, to determine differences between internal cues versus external cues. The purpose of study II was to replicate the results of study I, therefore no control group was used. Hospital assessment of subjects BGL estimations was also eliminated. Sixteen subjects participated in study II. All of the subjects, for both studies were self-selected, however each study took subjects from different cities of the same state.

Treatment for subjects in study I consisted of 90 minute sessions once a week for ten weeks. Treatment subjects recorded their actual BGL, their estimate of their BGL, and the cues that they received in order to estimate their BGL. Results were discussed during each weekly session. Control subjects discussed stress management techniques, and their homework consisted of stress management exercises and relaxation. Treatment for all of the subjects in study II consisted of a structured and standardized program for training subjects to recognize relevant BGL cues. This program manual, developed from study I, would allow for replication by others.

Study I revealed that hospital assessment of subjects was not very useful, due to the fact that it is unrealistic of a healthy diabetics environment. Diabetics do not only receive their cues internally, but also externally, and rely more heavily on those external environmental cues, such as time of day, and amount, type, and quantity of food eaten. Study I showed improvement of BGL estimations of subjects in both the control and experimental groups, however, only 40% of control subjects showed improvement, whereas 70% of experimental subjects improved their accuracy. In study II, 87% of the subjects showed improvement of BGL estimations. Although these results are very promising, the authors caution that patients should never allow BGL estimations to replace self-monitoring blood glucose (SMBG), but that they should supplement their treatment with improving estimation accuracy for those times in which SMBG equipment is not available.

Feinglos, Hastedt, & Surwit (1987) studied the effects of relaxation therapy on patients with IDDM. Twenty subjects displaying poor control of their diabetes were chosen to participate in the study. Ten subjects were randomly assigned to a control group, and the other ten to a treatment group. All subjects were placed on a diabetic diet, and a baseline was established. Treatment for the experimental group consisted of five sessions of EMG biofeedback, each session lasting 50 minutes. EMG measurements were taken from the frontal region, and subjects received auditory feedback. Subjects were also instructed to practice their progressive relaxation twice a day for seven days. Subjects in the control group received EMG biofeedback, but no relaxation training. Treatment continued for six weeks, and subjects then returned to the medical center for blood glucose testing.

Insulin dosages of neither the control, nor the treatment group changed. Further, there was no positive influence found on progressive relaxation in the treatment group. However, it is noted that not only did these subjects display poor control, but often were not self-monitoring blood glucose at home. A small, yet statistically significant change was found in the frontal EMG activity of the treatment group, suggesting learned relaxation. Yet this had no effect on blood glucose tolerance.



Moses and Bradley (1985) studied accuracy of blood glucose estimation using 20 insulin-dependent diabetics. There were ten females and ten males. Subjects were divided into an experimental group of five females and five males, and a control group of five females and five males. The mean age for the experimental group was 35.2 (a range of 23-49 years), and was 37.6 (a range of 20-57 years) for the control group. The mean history of insulin-dependency for the experimental group was 11.3 years, and was 12.8 years for the control group.

The study contained four phases. Phase one was baseline, with a duration of five days. Phase two was feedback, with a duration of 14 days. Phase three was an immediate follow-up, with a duration of five days. Phase four was a follow-up after three months that lasted for five days.

Results for the experimental group were reported for only nine subjects, and results for the control group were reported for only eight subjects. During phase one, the experimental group had 52% accuracy in reporting BGL, and the control group had 59% accuracy. During phase two, the experimental group had 65% accuracy in reporting BGL. The control group did not have a phase two because they received no biofeedback. In phase three, the experimental group had 68% accuracy in reporting BGL, and the control group had 58% accuracy. In phase four, the experimental group had 60% accuracy in reporting BGL, and the control group had 59% accuracy.

These results show a slight increase in the accuracy of BGL estimations for the experimental group after the biofeedback; however there was not a statistically significant difference between the two groups to report that biofeedback really made that much of a difference. Perhaps, if the biofeedback phase lasted for more than 14 days, the subjects would be better trained and could greatly increase their accuracy of estimations, however, this is only speculation. It should also be noted that there were large age ranges, and a large variability in the history of insulin dependency within both the experimental and control groups. These variables may play a crucial role in the ability to accurately estimate one's own BGL.

Lane, McCaskill, Ross, Feinglos, & Surwit (1993) studied the effects of relaxation training on type 2 diabetics. Thirty-eight NIDDM patients with poor control volunteered to participate in this study. Preliminary testing was conducted over a five day period in which baselines were established. Subjects were then randomly assigned to a control group or an experimental group after being placed in one of four weight classes.

Treatment for both control and experimental subjects consisted of 12 months of clinical management and standardized diabetes education. Experimental subjects further received 50 minutes of auditory EMG biofeedback-assisted relaxation training once a week for the first eight weeks, and during follow-up visits at three, four, five, and six months. They were also instructed to practice relaxation techniques twice a day at home for the entire span of the study. Six of the subjects did not complete the study. Four of the six had to begin insulin treatments, and the remaining two developed unrelated problems.

Both the control and the experimental group showed improvement of BGL, however there was no significant improvement in the experimental group compared to the control group. The experimental group was able to significantly lower forehead tension levels using EMG biofeedback, indicating learned relaxation. This would suggest that the biofeedback-assisted relaxation training did not make a significant difference in the clinical management of NIDDM.

Miley (1989) studied relaxation training on 21 type 2 insulin-dependent diabetics that were chronically ill inpatients with multiple symptomatology. Diabetes was not any of the subject's primary diagnosis. Type 2 diabetics are usually referred to as non-insulin-dependent, however, these patients after acquiring diabetes later in life, had deteriorated to the point of insulin injections in order to maintain BGL.

Subjects were randomly assigned to one of three conditions: biofeedback-assisted relaxation, patient-centered psychotherapy, or control. Subjects in the biofeedback condition received auditory and visual EMG biofeedback during relaxation for 45 minutes. Subjects in the psychotherapy condition received nondirective therapy for 45 minutes discussing their diabetes. Subjects in the control condition stayed in their rooms during a 45 minute time interval in which no hospital procedures were scheduled. All of the subjects BGL was measured before and again after their 45 minute session. Sessions were held once a week for three weeks.

Subjects in the biofeedback condition significantly lowered their BGL more than subjects in the other two conditions during all of the sessions, except the third, where no significant difference was found between the biofeedback subjects and the psychotherapy subjects. No significant differences at all were found between the psychotherapy and the control subjects. Therefore, this study found biofeedback-assisted relaxation to be a useful tool in the treatment of NIDDM. However, treatment only lasted for three weeks, and there was no follow-up to determine if differences remained over a longer period of time.

Dean (1984) studied the effects of thermal biofeedback on peripheral blood flow in ten subjects with NIDDM. Ten non-diabetic subjects participated in the control group. Six different variables were measured for the effectiveness of temperature biofeedback. Both the control and the experimental subjects received biofeedback, and measures were taken from both groups. Essentially, what made the control subjects controls, was the fact that they were non-diabetic. Three experimental subjects did not complete the study, one due to deteriorated health, and two others due to discharge from the hospital. Two control subjects missed the last appointed session, but completed them a later day.

Treatment consisted of an initial baseline session, followed by four biofeedback sessions, each session lasting 40 minutes, once a day, for five days. Auditory feedback was given via tones, and visual feedback was given via lights, and a needled meter. Interpretation of these signals were not given until after the initial baseline session.

Both control and experimental subjects displayed significant increases in skin temperatures from both hands. The dominate (right) hand temperature of the experimental subjects significantly increased more than the dominate (also right) hand temperature of the control subjects. There were no significant differences found between groups on the non-dominate hand. Therefore, although both groups were able to significantly increase their skin temperature, the experimental subjects were able to achieve greater increases. However, these were the only two measures of the six in which any significant change was found.

Rice & Schindler (1992) studied the effect of thermal biofeedback-assisted relaxation on blood circulation of both type 1 and type 2 diabetic patients. Forty subjects participated in the study. Twenty one were insulin-dependent, while the remaining 19 were non-insulin-dependent. All subjects participated in two phases, phase one being the control condition (with a duration of four weeks), and phase two being the experimental condition (also a four week duration). Therefore, each subject served as their own control. Further, subjects were divided into two groups to control for historical effects. Group one first participated in the control condition, then as they were beginning their experimental condition, group two began their control condition. Group one consisted of 12 IDDM, and eight NIDDM subjects. Group two consisted of nine IDDM, and one NIDDM subjects.

During phase one, subjects recorded their skin temperatures from the great toe both before, and again after a 15-20 minute period of self relaxation five days a week, for the entire four weeks. During phase two, subjects were given a tape with instructed relaxation techniques. They were to record their skin temperatures from the great toe before, and again after using the relaxation tape five days a week, for the entire four weeks. During phase one, temperatures were recorded using a "Biotic Band". During phase two, temperatures were recorded using a thermal biofeedback sensor. Also, all subjects with IDDM were given "B-D Glucose Tablets" in the event that they should experience hypoglycemic reactions, which are common for insulin-dependent diabetics when undergoing relaxation training.

Temperature changes as well as blood volume pulse changes between phases were found to be statistically significant. The biofeedback-assisted relaxation training (BART) program was found to be responsible for approximately 55% of the increase in temperature, and 71% of the increase in blood volume pulse. Therefore, the significant findings of this study can be accurately attributed directly to the BART program.

Studies involving the usefulness of relaxation training techniques when applied with biofeedback may be of major importance, and make large contributions to the behavioral treatment of both insulin-dependent and non-insulin-dependent diabetic patients. It is difficult to show the effects of relaxation training on biofeedback, and the effects of these two combined treatments on the disease, if the subjects are not accurately trained in the techniques. Many subjects are unable to successfully master these techniques within a brief amount of time. Therefore, time allocation is of major importance when investigating the usefulness of these techniques.

A diabetic patient's ability to successfully estimate their own BGL can greatly increase the patient's control of the disease by reducing the patient's risk of hyper- and/or hypoglycemic reactions. Therefore studies of blood glucose discrimination training may lead to increased health of insulin-dependent diabetic patients. However, the age, and number of years of insulin-dependency of the patient should be factors in these studies. Theoretically, the longer a patient has had diabetes, the more sensitive they are to fluctuations in their own BGL. Therefore, patients with a longer history of insulin-dependency should be able to predict their BGL more accurately than patients with a recent history of insulin-dependency. Unfortunately this is not what the data is suggesting. However, perhaps training non-insulin-dependent diabetic patients to accurately estimate their BGL to prevent insulin-dependency is a possibility of future research in this area.

It has been noted by many that stress may have very negative effects on a patients' treatment of diabetes mellitus (Evans, 1985, & Surwit & Feinglos, 1984). Therefore, another possibility of future research is longitudinal studies with both longer relaxation training sessions, and longer biofeedback sessions. The behavioral perspective on diabetes mellitus could possibly offer an effective alternative treatment to patients with this disease for which there is no known cure. However, this would be very time consuming and costly.

There are two final cautionary notes. First, treating adolescent patients with diabetes mellitus with the use of biofeedback is slightly different. Older children may benefit greatly from the sense of autonomy gained through biofeedback, but younger children are often unable to recognize the "reward" associated with biofeedback. It is suggested that if they are successful in biofeedback, they should be given a more tangible reward immediately (Schowalter, 1983).

Finally, all patients need to be made aware of the fact that although certification training is available for biofeedback therapist, it is not required (Guthrie, 1988). This may be a potential problem with research studies. Although many do mention the use of a credentialed, or at least experienced therapists trained in biofeedback, many do not. It is entirely possible that results produced in some studies would be much different had a certified biofeedback therapist been implementing the program. Although the research effects should always be independent of the data collectors, subjects that have been improperly trained, and/or misinterpretations of data may inadvertently skew the results.

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## Antisocial Behavior in Children

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*The possible causes of antisocial behavior in children and adolescents are examined. Family factors such as certain parenting practices, divorce, and poverty are found to be important. Genetic influence, the individual's own predisposition, and deviant group membership are also contributing factors. Sex differences and possible interventions are discussed.*

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### INTRODUCTION

#### Antisocial Behavior in Children

Why do children commit crime? This is a question many people are asking. Rutter (1997) states, "Over the last fifty years, crime rates have increased some fivefold or more in most industrialized Western countries" (p. 391). With the crime rate on the rise, especially juvenile crime, people are searching for answers. As a result, researchers are scrambling to find answers to these questions. This has resulted in a wealth of information on children and antisocial or aggressive behavior.

The media attention this phenomenon has received has the public repeating an endless array of questions. Who do we blame? Do we blame the child, or do we blame the parents? Is it caused by environmental factors or family stressors? Is it caused by biological or genetic factors? If it is biological or genetic in origin, can we hold the child responsible? This paper will explore some of the alleged causes of antisocial behavior in children.

The first and most basic question we must answer is: What is meant by the term antisocial or aggressive behavior? Wicks-Nelson and Israel (1997) define antisocial behavior as, "a pattern of behavior that violates widely held social norms and brings harm to others" (p. 417). There are two different kinds of antisocial behavior. The first is called adolescence-limited antisocial behavior. This is the most common. Children who have this disorder usually do not start showing aggressive behavior until adolescence. Their misbehavior tends to be less serious. These children usually engage in only isolated incidents of antisocial behavior. They are also less aggressive, and the behavior does not continue past adolescence (Wicks-Nelson & Israel, 1997).

The second type of antisocial behavior is called life course persistent antisocial behavior. Children who fall into this category generally begin their antisocial behavior at a younger age, and it also tends to persist beyond adolescence (Wicks-Nelson & Israel, 1997). Therefore, children who begin antisocial behavior by their early elementary school years are usually still having problems later in their adult years. Children in this category are also more aggressive (Wicks-Nelson & Israel, 1997). Further, without intervention, young children who display antisocial behavior are likely to engage in increasingly more and more aggressive behavior. Olweus believes that early antisocial behavior is stable over time, much like the stability of IQ coefficients (Patterson, DeBaryshe, & Ramsey, 1989).

#### Family Factors

Many family factors, or stressors, have been linked to antisocial behavior in children. Farrington (as cited in Patterson et al., 1989) says that these factors include antisocial behavior in other family members, marital conflict and divorce, poor quality parenting, neglect, parental psychopathology (Wick-Nelson & Israel, 1997), unemployment, and family violence (Patterson et al., 1989). Also linked to the development of antisocial behavior are family demographic variables such as socioeconomic status, family size (Wicks-Nelson & Israel, 1997), race, neighborhood, parental education, income and occupation (Patterson et al., 1997). Family factors begin to be important very early in development (Tolan, Guerra, & Kendall, 1995).

Capaldi and Patterson (1991) conclude that parents with antisocial difficulties have been especially linked to parenting practices associated with the development of aggressive behavior. These parents tend to have low involvement with their children (Wicks-Nelson & Israel, 1997). This could suggest that children learn to foster antisocial behavior in their own kids after that behavior has been fostered in them by their own parents. This would mean that handing down poor parenting practices could perpetuate the problem (Wicks-Nelson & Israel, 1997). Bandura (as cited Wicks & Israel, 1997) claims that children learn aggressive behavior from a model, for example, a parent. West and Prinz (1987) suggest that heavy drinking by a parent is also associated with low involvement and monitoring. In addition, these behaviors are linked to antisocial behavior in children. Patterson et al. (1989) noticed when observing in the home of a distressed family, the children's prosocial behavior is often ignored or inappropriately responded to by the parents.

Patterson (as cited in Wicks-Nelson & Israel, 1997) observed that children may also learn aggressive behavior by being rewarded for that behavior. For example, a child may hit another child to get a toy. Assuming he does not get caught and punished, he is rewarded by acquiring the toy. This will usually lead to repetitions of this behavior.

McLeod and Shanahan (1996) found that children from lower socioeconomic status suffer from more mental health problems than children from a higher socioeconomic status. They also claim that the longer the child is subjected to poor socioeconomic conditions, the worse his/her mental condition will become. McLeod and Shanahan conducted a longitudinal study in which they studied the effects of poverty on children over a five year period. They found that children who were poor all five years, versus those who were transiently poor, had higher rates of antisocial behaviors. This suggests that persistently poor children will deviate more and more from the norms of socially acceptable behavior (McLeod & Shanahan, 1996).

Mrazek and Haggerty (as cited in McLeod & Shanahan, 1996) state that parents who deal with persistently poor conditions are under a greater amount of stress than those who do not have to deal with poverty or only deal with it in transient states. This stress can lead to marital conflict and punitive parenting practices, both of which have been linked to an increase in antisocial behavior in children.

Research shows that parents who are uneducated and work in unskilled professions are generally not very good at discipline, parental monitoring, problem solving, positive reinforcement, and parental involvement. They are also more likely to use authoritarian parenting styles. This parenting style is characterized by actions such as harsh punishment and strict control of the child's behavior. In contrast, parents from the middle socioeconomic status are more likely to use an authoritative parenting style. This style is characterized by things such as using reasoning and psychological forms of punishment, allowing children more freedom and self-direction, showing positive emotions toward children, and supporting emotional and cognitive growth (Patterson et al., 1989).

Not all research finds a relationship between antisocial behavior and a disadvantaged socioeconomic status. Olweus (1980) conducted research on a group of Swedish boys. He found a zero correlation between the boys' socioeconomic status and their aggressive behavior. He claims that, in general, the socioeconomic status conditions were not related to the aggression levels in the boys. Olweus further states, "This shows that aggressive boys as well as poor and good rearing conditions can exist in all kinds of families, independent of their position in the social hierarchy" (p. 658).

Family stressors, such as marital conflict and divorce, can lead to behavior problems in children. Hetherington, Stanley-Hagan, and Anderson (as cited in Wicks-Nelson & Israel, 1997) suggest divorce may cause a disruption in parenting practices. These may include a disruption in monitoring and involvement (Wicks-Nelson & Israel, 1997), parental responsiveness, and affection (Patterson et al., 1989). Divorce may also increase parental punitiveness and irritability (Patterson et al., 1989). Olweus (1980) suggests that conflict between mother and father may increase the mother's negative feeling toward boys, which may increase the boy's aggressive behavior.

Peck (1988) also states that the absence of a parent creates a disruption in the natural sequence of events, especially for adolescents. Teenagers are moving into a stage where they are preparing to leave home. When a parent is the one who leaves, this creates a disruption and stress for the child.

### **Genetic Influence**

Research has shown many ways in which parents may influence aggressive behavior in children through parenting practices and environmental stressors. However, some researchers suggest that the parents' influence may go beyond environment; there may be a genetic link.

Rutter (1997) states that quantitative research has shown the importance of genetics in almost every form of human behavior. He also states that empirical research increasingly shows the "importance of genetic factors for individual differences in antisocial behavior" (p. 391).

Research done by Robins and Earls (as cited in Patterson et al., 1989) shows that having one antisocial parent puts a child at a high risk of antisocial behavior; having two antisocial parents puts the child at even greater risk. Three-generation concordance has also been documented. Mednick, Gabrielli, and Hutchings (1984) also found higher rates of antisocial behavior concordance in biological relatives versus adopted relatives. Rutter (1997) suggests that there is a greater genetic component in the life-course persistent antisocial behavior than in the adolescence-limited antisocial behavior.

### **Child Predisposition**

Sometimes, just the characteristics of the child may predispose him to antisocial behavior. Rutter (1997) states that research findings show that quite a wide range of features are associated with increased risk of antisocial behavior. These include hyperactivity inattention, novelty or sensation seeking, impulsivity, low physiological reactivity, and cognitive impairment.

A child's temperament may also lead to aggressive behavior. Children who have a negative attitude toward authority, work, and school are more likely to be aggressive (Patterson et al., 1989). Environmental stressors can sometimes lead to temperament problems in a child. For example, Patterson et al. (1989) suggest that the more negative childhood experiences a boy has, the more active and hot-headed his temperament will be. Further, he is more likely to develop into an aggressive adolescent.

School failure and rejection by peers are also linked to aggressive behavior. Usually, antisocial children also lack social skills (Patterson et al., 1989).

### **Deviant Peer Group Membership**

School failure and rejection usually lead to a deviant peer group membership. These peer groups usually support aggressive behaviors. This influence is particularly strong during adolescence, but can begin as early as the elementary school years.

This problem is generally worse for persistently poor families than transiently poor or non-poor families. Beyond the stressors and other factors that go along with poverty, Egbuonu and Starfield (1982) suggest these families may find it harder escape a bad or rough neighborhood where gangs and violent activities are present. Persistently poor families never acquire the money to move from these neighborhoods.

Guerra, Tolan, Huesmann, Van Acker, and Eron (1995) report that aggressive behavior is related to support from classmates. Adolescent delinquent behavior is generally a group activity, and this is the time when peer influences are of particular importance (Rutter, 1997).

### **Sex Differences**

There are reported sex differences in aggressive behavior. This is a well-known and established fact in this area of research. Boys suffer from behavior disorders much more frequently than girls (Olweus, 1980). This does not mean, however, that it is exclusive to boys. Behavior problems are an externalizing disorder, from which boys are more likely to suffer. Girls, on the other hand, are more likely to suffer from internalizing disorders such as eating disorders or depression.

Sex differences are also reported in how effectively children deal with marital conflict and divorce. Wicks-Nelson and Israel (1997) report that there is more often a relationship between marital conflict and aggressive behavior in boys than for girls. The fact that mothers may transfer hostile feelings of the father



to the boy may be a factor in this relationship. Mothers who deal with divorce are more likely to look to their daughter as a confidant, especially a teenager daughter.

When a couple goes through a divorce, it is generally the mother who gains custody. Being a single mother is tough, no matter what sex the children are. However, it may be harder for a mother to discipline her son, especially an adolescent son, who may be taller and stronger than she is (Saayman & Saayman, 1988).

### **Intervention**

It is a well-known paradigm that prevention is better than treatment. It is better to stop a problem before it starts than to treat a problem after it has already produced its effects. However, we know that it is very difficult to tell where a problem may occur until it is too late. Even then, the earlier the problem is caught and intervention begins, the better.

In the past, geneticists used evidence of genetic origins of behavior to claim that environmental interventions would be not effective in treating behavior problems (Rutter, 1997). However, we now know that intervention programs are very effective in treating behavior problems, regardless of their origins.

Intervention programs are most effective if they begin early, before aggressive behavior can intensify into serious behaviors. Tremblay, Kurtz, Masse, Vitaro, and Phil (as cited in Tolan et al., 1995) found these comprehensive preventive intervention programs in the elementary school years can stop the childhood aggression from turning into more serious forms of adolescent antisocial behavior.

Patterson (as cited in Tolan et al., 1995) claims that affecting the entire family is necessary in intervention programs. Treatment is virtually ineffective if it focuses on one individual or aspect without looking at the entire picture. Family-focused prevention has aimed primarily at improving parenting skills, and has expanded to communication skills and managing external stress for families with adolescents (Tolan et al., 1995).

Alexander and colleagues (as cited in Wicks-Nelson & Israel, 1997) identified a treatment called functional family therapy. It has been shown to reduce conduct disorders in children. In this therapy, the aggressive behavior of the child is presumed to serve a function in the family. This function serves to maintain the behavior, and if this function ceases to exist, the family system will collapse. Functional family therapy identifies the function served, and focuses on changing the family system in a way to not support this behavior. This is done through improving communication skills; modifying cognitive sets, expectations, attitudes, and affective reactions; and establishing new interpretations and meanings of behavior (Wicks-Nelson & Israel, 1997). In short, this program changes the role of each member in the family system.

### **CONCLUSION**

There are many potential factors that may determine who will develop behavior problems, or what causes them to develop. The environmental causes are intricate and complex. Individual differences between possible subjects further confuse the issue. However, by understanding the factors that put a subject at risk, we can develop better systems of prevention and intervention.

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## Race as a Predictor of Body Image Satisfaction and Body-Size Preference in Female College Students

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*This study was a replication of earlier studies that have explored the effects of race on body image satisfaction and preferred ideal body size. Eighty-five female college students (30 Black females and 55 White females) completed various measures of body image satisfaction. Line drawings were used to assess current and ideal body size. There was no significant difference in self-reported weight or in perceived current body size of the two groups, yet Black females reported less fear of fat, less drive for thinness, and less body dissatisfaction than did White females. Black females also selected a larger ideal body size from the line drawings. Implications are discussed in terms of the treatment of eating disorders.*

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### INTRODUCTION

Cultures have different views on the importance of thinness in women (Bowen, Tomoyasu, & Cauce, 1991). Studies have shown that Black women prefer a larger ideal body size (Powell & Kahn, 1995; Rucker & Cash, 1992) and a heavier ideal weight (Harris, 1994) than White women. Black men also prefer a larger body size in women than do White men (Thompson, Sargent, & Kemper, 1996), and Black men are more willing than White men to date a woman with a heavier than ideal body size (Powell & Kahn, 1995).

Although Black women tend to weigh more on average than White women (Abood, 1997; Abrams, Allen, & Gray, 1993; Harris, 1994), White women report a greater fear of becoming fat, a stronger drive for thinness, and more body dissatisfaction (Abrams, Allen, & Gray, 1993; Harris, 1994; Rucker & Cash, 1992). Black females also show less discrepancy between their current size and their ideal size than White women (Rucker & Cash, 1992), and a lower incidence of eating disorders (Dolan, 1991; Gray, Ford, & Kelly, 1987).

This study was a replication of earlier studies of the effects of race on body image satisfaction and preferred ideal body size in females. It was expected that: (a) compared to White women, Black women would report a greater degree of body image satisfaction (as evidenced by less fear of fat, less drive for thinness, and less body dissatisfaction); and (b) that Black women would prefer a larger ideal body size than would White women.

### METHOD

#### Participants

Ninety-one female students enrolled in introductory psychology courses at a midsized southeastern university participated in this study to earn research participation credit. Responses from six students were excluded because the participants indicated a race other than Black or White, were not U.S. citizens, or because English was not their native language. The final sample consisted of 30 Black females and 55 White females. The mean age for the Black females was 22.00 (SD = 6.04), and the mean age for the White females was 21.84 (SD = 5.49).

## Measures

The Goldfarb Fear of Fat Scale (GFFS; Goldfarb, Dykens, & Gerrard, 1985) is a 10-item questionnaire used to measure a person's fear of becoming fat. Answers are rated on a 4-point scale, ranging from "never true" to "always true." Higher scores indicate a greater fear of fat. The GFFS has been reported to have high internal reliability, with a Cronbach Alpha of .85 for the single factor (Goldfarb et al., 1985).

The Drive for Thinness Subscale of the Eating Disorders Inventory (EDI; Garner, Olmsted, & Polivy, 1983) contains seven questions about concern with dieting and gaining weight. There are six possible responses, ranging from "always" to "never." Items are scored from 0 to 3, with the most deviant response receiving a 3. For example, on the question, "I am preoccupied with the desire to be thinner," the responses would be scored as follows: "always" = 3, "usually" = 2, "often" = 1, "sometimes" = 0, "rarely" = 0, "never" = 0. If, on the other hand, the question is phrased in a positive manner, such as "I eat sweets and carbohydrates without feeling nervous," the items are reverse-scored with "always" = 0 and "never" = 3. The reliability coefficient for the Drive for Thinness subscale of the EDI has been reported to be .85 (Garner et al., 1983).

The Body Dissatisfaction Subscale of the Eating Disorders Inventory (Garner, Olmsted, & Polivy, 1983) is scored in the same way as the Drive for Thinness subscale, with a higher score indicating greater body dissatisfaction. There are nine questions that determine dissatisfaction with body shape and size, especially the stomach, hips, buttocks, and thighs. Reliability coefficients for this subscale of the EDI have been reported to be .90 and .91 (Garner et al., 1983).

The Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987) is a measure of concerns about body shape and feeling fat. It contains 34 questions, with answers ranging from "never" (1) to "always" (6). Higher scores indicate greater dissatisfaction with body shape and more feelings of fatness. Cooper et al. determined the BSQ to possess adequate validity (1987).

Line drawings created by Massura and Stunkard (1979) were used to determine preferred body size. The six silhouettes of various female body sizes were arranged on the page in descending order from the heaviest (6) to the thinnest (1). Participants were asked to choose the silhouette that most closely represented their current body size and the silhouette that most closely represented their ideal body size.

## Procedure

Participants completed a packet consisting of the GFFS, the Body Dissatisfaction and Drive for Thinness subscales of the EDI, the BSQ, and the six line drawings. The students were also asked to provide their current weight and ideal weight. All responses were anonymous.

## RESULTS

Table 1 shows the mean scores for Black and White females for each of the comparisons made. Some participants did not provide complete data on four of the measures (GFFS, BSQ, current weight, and ideal weight), so the sample size varied slightly for each of these variables.

Significant differences were found between the groups on all four measures of body image. Black females scored significantly lower than the White females on the Goldfarb Fear of Fat Scale,  $t(82) = -3.57$ ,  $p < .01$ , the Drive for Thinness Subscale,  $t(83) = -2.44$ ,  $p < .05$ , the Body Dissatisfaction Subscale,  $t(83) = -2.80$ ,  $p < .05$ , and the Body Shape Questionnaire,  $t(82) = -4.27$ ,  $p < .01$ .

The Black females also chose a significantly larger ideal body size from the six line drawings than the White females,  $t(83) = 3.57$ ,  $p < .01$ . In both groups, most of the participants chose drawing #2 as their ideal body size (with #1 being the thinnest and #6 being the heaviest), but #2 was chosen by 70% of the Black females as compared to 47% of the White females. Forty-two percent of the White females preferred drawing #1, but only one Black participant chose size #1 as her ideal body size. Twenty-seven percent of the Black females chose drawing #3; only 9% of the White participants selected #3 as their ideal body size.

Chi-square analysis showed that the proportion of Black females that chose drawings #1, #2, and #3 as their ideal body size was significantly different from the proportion of White females that chose drawings #1, #2, and #3 as their ideal body size,  $\chi^2(2, N = 84) = 15.83, p < .05$ .

In addition, the Black females preferred a higher ideal weight than the White females,  $t(74) = 3.11, p < .01$ . There was no significant difference between the groups for current weight,  $t(81) = 0.37, p > .05$ , or perceived current body size,  $t(83) = -1.30, p > .05$ .

In a within groups comparison, White females reported a significant difference between their perceived current body size and their ideal body size,  $t(54) = 9.92, p < .01$ . In contrast, there was no significant difference between current and ideal body size for the Black females,  $t(29) = 1.93, p > .05$ .

## DISCUSSION

The results of the present study indicate that for females, race plays a role in body image satisfaction and preferred body size. Although Black and White females did not differ on current weight or on perceived current body size, White females had a greater fear of becoming fat, were more concerned about dieting and being thin, and were more dissatisfied with their bodies than the Black females. These findings are consistent with previous studies (Abood, 1997; Abrams, Allen, & Gray, 1993; Harris, 1994; Powell & Kahn, 1995; Rucker & Cash, 1992). Also, as in previous studies, Black females preferred a larger ideal body size than White females (Powell & Kahn, 1995; Rucker & Cash, 1992) and reported a heavier ideal weight (Harris, 1994).

It would appear that Black females use a different set of standards for evaluating their bodies than do White females, have a different idea of what body size is attractive in women, and are more accepting of their bodies in general. Indeed, no significant difference was found between current body size and ideal body size for the Black females, whereas White females did show a discrepancy between their current body size and ideal body size. This is consistent with the findings of Rucker and Cash (1992).

Understanding cultural differences in body image may be helpful in treating eating disorders. It has been shown that there is a relationship between media exposure and eating disorder symptoms (Stice, Schupak-Neuberg, Shaw, & Stein, 1994). Yet the low prevalence of eating disorders and greater body satisfaction in Black women would indicate that they are not affected by the thin ideal portrayed in the media in the same way that White women are. A goal of future research should be to gain an understanding of what makes the Black population immune to this thin ideal. It would also be of interest to compare older Black women with younger Black women to see if body image standards within the Black culture are changing over time.

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Table 1

Means and Standard Deviations for Study Variables by Race

Variable	Black Females			White Females		
	n	M	SD	n	M	SD
Goldfarb Fear of Fat	29	18.10	6.13	55	23.24	6.32**
Drive for Thinness	30	3.90	5.48	55	7.16	6.09*
Body Dissatisfaction	30	8.83	5.55	55	13.33	7.77*
Body Shape Questionnaire	30	71.87	31.28	54	105.56	36.37**
Current Body Size	30	2.63	1.19	55	2.98	1.18
Ideal Body Size	30	2.23	0.50	55	1.71	0.71**
Current Weight	30	142.57	22.80	53	140.34	28.13
Ideal Weight	28	133.79	13.83	48	122.69	15.65**

Note: \* $p < .05$ . \*\* $p < .01$ .

# A Review of Workspace Personalization

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*Workplace personalization literature is an interesting field of research that may help employers and employees learn more about how they perceive their jobs. This paper examines different explanations of personalization including territoriality, the role that emotional expression plays in personalization, how personalization of low stimulus environments affects worker morale, and the issue of how identity and status may influence personalization.*

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## INTRODUCTION

### Workplace Personalization

The purpose of this paper is to explore research on employee personalization of workspace. The paper will review literature on why people personalize and examine what effect personalization has on how employees feel about their jobs.

Why people personalize their environments has intrigued social scientist for decades. People often go to great lengths to customize their surroundings. This behavior is especially evident in office environments; consequently, employee workstations have become attractive sources of data for some researchers interested in how people personalize their environment.

Researchers generally attempt to answer two questions regarding employee personalization of workspace. First, why do people feel compelled to personalize and second, what, if any, effect does personalization have on how employees respond to their work. In attempting to answer these questions, it has been speculated that personalization helps people gain a sense of primacy within a space and also lets other know who the space is predominately controlled by (Holahan, 1982). Another common explanation is that personalization satisfies a need of employees to express their individuality and creativity. Thus, by satisfying this need, employees feel emotionally stimulated by their surrounds and better about their jobs in general (Scheiberg, 1990).

### Territoriality and Workers

One explanation of personalization involves territoriality. Territoriality, as its name implies, is about people marking their territory (for example, their workstations) with personal artifacts that help others determine ownership. Like animals marking their territory, humans also engage in regulating what we perceive as our boundaries. Altman (1975), defines human territorial behavior as:

A self/other boundary-regulation mechanism that involves personalization of, or marking of, a place or object, and communication that it is [owned] by a person or group . . . . Defense responses may sometimes occur when territorial boundaries are violated (p. 107).

This explanation is applicable to a range of distinct spaces, from living quarters to neighborhoods. In fact, Altman (1975) distinguishes between primary, secondary, and public territories (pp. 111-120). Primary territories are spaces owned by individuals and central to their existence. Examples include a person's house or bedroom. Public territories include sidewalks, beaches or stores where virtually everyone may come and go without incident. The category that this paper is most concerned with is termed secondary territories and conceptually lies somewhere between the primary and public types. In secondary territories, ownership is more ambiguous and therefore, personalization is often more pronounced. A person's workstation is an example this type. A completely unpersonalized workstation would reveal virtually nothing to an outside observer. When a person sees it as his or her own territory, however, someone has a legitimate claim to



their workstation (at least for awhile), and must somehow personalize it to announce ownership. Otherwise, this ambiguous "secondary territory" may be lost.

Territoriality, unfortunately, is not a fully satisfactory explanation of workspace personalization. Territoriality assumes a relatively competitive and somewhat hostile environment exists and modern work environments are fairly benign. In their examination of workplace violence, Cox and Leather state:

A number of studies, mainly from an ethological perspective, have demonstrated the tendency of many species to show aggression when their territory has been invaded. However, the application of the concept of territoriality to the explanation of human aggression has been unsatisfactory (see, for example Ardley, 1966) (1994).

Despite this assessment, Cox and Leather (1994) state that people who display a history of violence may be provoked if their personal space is encroached upon. Since the majority of offices are inhabited with relatively non-violent people, territoriality as the sole motivation for personalizing seems unlikely. Gifford (1997) explains that social climate appears to influence territoriality and that congenial social climates are associated with improved territorial functioning. It could be concluded that since most people work in relatively safe offices, they would not be especially compelled to engage in moderate or even low-level territorial personalization. Most researchers, while conceding that on some level territoriality may influence aspects of personalization, believe other forces may play a more central role.

### **Other Explanations for Personalization**

Carrere and Evans (1994), studied the work and living quarters of a group of Antarctic researchers. The subjects were spending the winter in Antarctica, and were confined to isolated and confined environments, or ICES, for months at a time. Their study examined the functions of personalization in both public and private spaces throughout the winter. Carrere and Evans (1994) concluded that while personalization was a way to communicate territory, it also helped to create visual stimulation and foster originality:

Our observations during this Antarctic winter suggest that personalization of an ICE serves not only to establish territory and demonstrate attachment of people to their setting, but more fundamentally that personalization behaviors are the means by which people create environments that are more pleasing to inhabit (p. 731).

Carrere and Evans (1994) also determined that personalization was important because it allowed modification of low-stimulus, austere environments and therefore positively changed how people perceived their work environment.

While Carrere and Evans' (1994) research is interesting, one could doubt whether or not it is generalizable to most office environments north of Antarctica. Fortunately, other researchers have studied personalization in more conventional office settings and have come to their own conclusions.

Oldham and Rothchford (1983) studied how office environments affect workers' reactions to their jobs. In one part of their study they measured personalization around employee workstations by summing the number of nonwork related artifacts found at each workspace. Oldham and Rothchford (1983) concluded that, "employees are likely to mark their spaces [personalize] . . . when they have positive job and interpersonal experiences at work" (p. 552).

### **Personalization and Emotion**

Scheiberg (1990) studied two conventional work groups at a major university and concluded that a human desire to express emotion and respond emotionally to stimuli are the keys to understanding office personalization. In Scheiberg's (1990) study, one group (Unit A) was isolated from the public and worked in the university's library cataloging new books. The other group (Unit B) worked as a proxy for the university Regents and administered funding for research. Unit B's office was open to all and dealt extensively with the public.

Scheiberg (1990) described Unit A's work environment as hard to find and existing literally in a basement. There were few windows and the ones that were there were darkened. Scheiberg described the

furniture as “old and drab” (p. 331). However, Unit A’s workspaces were elaborately personalized and Scheiberg (1990) states that the decoration seems to provide specific and concrete stimuli to which the individual will have a predictable emotional response (p. 334). The managers of Unit A actively encouraged the employees to personalize their workspace.

Unit B, while operating in a less austere environment than Unit A, had strict rules regarding personalization. The manager of Unit B felt that the department needed to “instill trust and confidence” and appear dignified and professional (Scheiberg, 1990, p. 332). Therefore employees were allowed to decorate only the horizontal surface of their desk and nothing could appear over the tops of cubical walls. Despite the restrictions, people still personalized their desk with a subdued array of marker (Scheiberg, 1990). Scheiberg (1990) notes that employees in both units were comfortable with their environment and personalized, even though the units differed greatly in appearance, function and managerial philosophy. Both units enjoyed their job and work culture and both generally personalized as much as management allowed them.

Scheiberg (1990) considers the type of personalization she witnessed in her study a form of emotional expression and she believes it is very important for employee satisfaction:

Expressing emotions in the workplace is a vital process for employees. Satisfying this impulse can lead to greater satisfaction and ease in the workplace, in turn, making an employee feel better about his or her job (p. 337).

Scheiberg describes the benefits of personalization as follows:

This process [of employee personalization] then benefits everyone involved - the employee and the employers. As workers, we both manage and are managed, and understanding the ramifications of such symbolic and communicative behaviors as personalizing workspace can help us cope with, and enjoy both aspects of working (p. 337).

Scheiberg’s (1990) article is interesting and provokes thought. It suggests that emotional expression is a very powerful component of both job satisfaction and personalization of workspace. Her observation that “decoration seems to provide specific and concrete stimuli to which the individual will have a predictable emotional response” (Scheiberg, p. 334), incorporates behaviorism into her discussion. Gilmer and Deci, in their book *Industrial and Organizational Psychology* (1977), expound upon behaviorism’s role in how employees connect to their environment. Gilmer and Deci state, “Not only are both physical and psychological environments assortments of stimuli but these stimuli also determine when, how, where, and at times with whom we will behave” (Gilmer & Deci, p. 44). They use Skinner’s quote that “men are happy in an environment in which active, productive, and creative behavior is reinforced in effective ways” (as cited in Gilmer & Deci, 1977, p. 44). Personalization is creative behavior and it is generally intended to elicit a positive response from the person personalizing and from people around her/him. Scheiberg seems to be suggesting that personalization is effectively reinforced by the emotional expression that employees exhibit when they personalize. This is an interesting idea that may warrant more research. However, even Scheiberg (1990) cautions against making excessive inferences about personalization and notes that personalization is “affected by many factors, such as individual taste, length of employment, and amount of hours put in on the job” (p. 335).

### **Personalization’s Relationship to Identity and Status**

Fischer (1997) theorizes that personalization of workspace is an expression of one’s identity within an organization. Fischer (1997) reviewed literature on employee personal space and identity and found several studies that view workspace as a medium through which individuals can express their identity and their status in the organizations hierarchy (Fischer, 1997, p. 89). Per Fischer (1997), expression of identity and status can be related to how an employee relates to her/ his workspace. Specifically, how people personalize their space is an expression of identity that relies on workspace as a medium. Fischer describes Sommer’s view that the decoration of space by an employee is a reflection of her of his personal values (as cited in Fisher, 1997). Assuming that an employee has control over a space that is recognized as her/his own, then personalization may be viewed as an indicator of control that an individual has in an organization

(Fischer, 1997). In theory, the more a space is personalized to reflect one's values, the greater the latitude for autonomy, and the greater the autonomy, the higher the status. Whether or not this view of personalization is accurate in most real world setting is worth investigating. The link between personalization and status may not always be apparent and should be tested. Fischer (1997) referencing Sundstrum's 1986 book, *Work Places: The Psychology of the Physical Environment in Offices and Factories*, concludes that, "Personalization makes recognition of individuality possible and seems to have positive repercussions on job satisfaction" (p. 91). If this is true, perhaps personalization affords employees at every level within an organization some degree of validation of self, or status, therefore affecting at least how they perceive themselves and possibly how others perceive them. Ultimately, personalization may have less to do with status and more with individual expression. As Fischer notes, "Personalization may inform others of our taste, our preferences, our opinions, and our attitudes" (1997, p. 91).

### **Consequences of Inhibiting Personalization**

Steele (1973) gives the following warning to organizations considering whether or not to control their employee's workspaces:

Many people spend more waking time at work than in any other single activity. Their work setting, whether it is an office, a plant floor, a mill yard, or a ship's hold, is a major component of their psychological life space and is more concrete and visible than their place in the organization's social system. When a major piece of one's life space is controlled by someone else, a medium for problem solving and testing one's ability's is lost (p. 140).

Ultimately, Steele (1973) concludes that "top-down decisions about space" lead to stifled growth and decreased initiative. (p. 141).

Another consideration that employers may want to weigh before inhibiting personalization is the potential gain afforded from understanding their employees on a deeper level. Personalization reveals a lot about a person that, otherwise, one may never have known. As Canter (1983) states, terms such as "personalization" and "place identity" are simply jargon that point to the "role which space has in telling us something about the person who inhabits it" (p. 22).

## **CONCLUSION**

Research on workspace personalization is interesting, but may not lead to much practical knowledge of how people feel about their work environment until more studies are dedicated to the specific topic of workspace personalization. The difficulty lies in the myriad of reasons people choose to personalize (Scheiberg, 1990). To come to solid conclusions, more studies should be undertaken involving only conventional workspaces.

Often, when research on personalization is conducted it involves how people personalize their homes or how workers in unique circumstances personalize their surroundings. Ornstein (1990) notes that the lack of explicit study on territorial markers and self-identity in the workplace requires researchers to speculate. The possibility of more conventional workspace personalization research being done may be hampered by a potential participant's uneasiness at having outsiders document her/his personal markers. This is unfortunate because research concentrating on employee personalization could clarify why personalization is so common and how it should be interpreted by organizations.

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## A Closer Look at Personality Characteristics of Smokers and Non-Smokers in College Students

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*The purpose of this study was to look at smoking behavior in college students to find relationships between smoking and other behaviors or characteristics. The 368 participants, of traditional college age, were given a three-part questionnaire to evaluate smoking history and behavior along with several personality characteristics. Four hypotheses evaluated possible predictors of smoking behavior. The hypothesis suggesting that smoking increases by college class status was not supported, showing that the frequency of smoking remains stable across the four years in college. Two additional hypotheses were supported suggesting that smokers are higher in both extroversion and unconventionalism. The final hypothesis that smokers score higher than non-smokers on self-monitoring was not supported. Taken together, these results suggest that college students are typically not new smokers nor are they likely to begin smoking for the first time while in college, that extroversion and unconventionalism may be used to identify potential smokers, and that self-monitoring is not an efficient predictor of smoking behavior in college students. These findings lend further emphasis on the need to target high school or younger students for smoking prevention programs. Furthermore, it is clear that there are identifiable characteristics of students at risk for smoking and these should be given serious consideration in designing programs.*

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### INTRODUCTION

In recent years, there has been special concern expressed for the increasing rate at which adolescents are smoking. As a result, there has been considerable research conducted to determine contributing factors of smoking initiation and cessation in this population. Further, some wonder if smoking may be related to other risky behaviors, and what personality characteristics may characterize smokers. This study proposes to take a closer look at some personality characteristics of smokers and non-smokers in college students.

Several comprehensive reports have revealed much about adolescent smoking behaviors. Two literature reviews have summarized previous research regarding smoking behavior and its effects. Giovino, Henningfield, Tomar, Escobedo, and Slade (1995) describe the epidemiologic effects of using tobacco products and dependency on them, the history of cigarette smoking in the United States, and comparing smoking trends in the whole population to that of trends pertaining to certain groups. This report stated that most smoking initiation occurs during adolescence. Furthermore, results suggest that if individuals have not begun to smoke by the age of 20, most likely they never will.

The second report, completed by the U.S. Department of Health and Human Services (1994), reviews conclusions of previous research. One finding, appropriate to this study is that adolescents are as likely to smoke as adults, and adolescents are less likely to quit smoking than adults. However, there are unique aspects of adolescent smoking.

One study focused on the contributing factors of smoking initiation and cessation in adolescent smokers (Zinser, Kloosterman, and Williams, 1994). A questionnaire completed by 177 college students revealed the causes of starting to smoke, the strength of their influence, smoking benefits, and causes of smoking cessation. The students were also asked information regarding how often they smoke and how long they have smoked. The authors found that adolescents rated friends as being the most influential cause of smoking initiation and the least influential cause of smoking cessation. In addition to external factors contributing to smoking behavior, there are internal influences also.

Another study attempted to link personality characteristics with smoking in college students. Lipkus, Barefoot, Feaganes, Williams, and Siegler (1994) administered the Minnesota Multiphasic Personality Inventory (MMPI) to 3,810 men and 836 women between 1964-1967 and examined their smoking behavior 20 years later. The study attempted to identify personality traits, which would predict smoking behavior. They were successful in that certain characteristics were found which set smokers and non-smokers apart. These characteristics fell into two factors-extroversion and unconventionality. Smokers were found to be extroverted and unconventional while non-smokers were introverted and more traditional. Some characteristics suggesting extroverted or unconventional personality types include impulsivity, rebellion, sensation-seeking, and anti-conformity (Lipkus et al., 1994). The relationship between unconventional traits and smoking behavior will be discussed later.

The last research study is rather unique in that it does not directly discuss smoking; instead the focus is on self-monitoring. though the two topics appear to be unrelated, the contention behind linking them is that perhaps there is an underlying mechanism or parallel behavior seen in smokers related to their level of extroversion and unconventionalism. One candidate for this is self-monitoring behaviors. According to Snyder (1974) self-monitoring involves observing and controlling one's behavior in social situations. Low self-monitoring may relate to extroversion and unconventionality in that persons with these characteristics are not concerned with traditional norms, and each centers on the interests of the individual, without regard to the behavior of others.

Prior literature suggests several causal factors in smoking; this study examines four aspects of cigarette smoking in college students. Based on the finding by Zinser et al. (1994), which stated that adolescents begin smoking due to the influence of peers, it can be predicted that smoking initiation can occur after high school graduation as well as prior to it. The reason is that peer pressure operates in college as well as in high school. Thus, an analysis of smoking behaviors will show an increase from freshman to senior year in the number of students who smoke, while the number of non-smoking students will decrease as they advance in class status.

Two additional hypotheses held that individuals with an extroverted or unconventional personality are more likely to be smokers than those who are introverted and conventional. This is consistent with the finding described above by Lipkus et al. (1994).

A final prediction can be inferred from the literature involving self-monitoring. Those low in self-monitoring are more likely to be smokers. The basis for this is Snyder's (1974) finding that low self-monitors either do not concern themselves with monitoring their expressive social behavior or are unable to do so. Whatever the reason, these individuals express themselves regardless of how others behave. This would also be consistent with the finding of unconventionalism (Lipkus et al., 1994).

This study is important because the prevalence of adolescent smoking is very high, and there is a need to identify, implement, and improve methods for combating this problem. This study emphasizes peer pressure and personality characteristics as serious causes of adolescent smoking initiation; if we can identify effective ways to predict smoking behavior, then it is possible to devise smoking prevention programs that will eliminate the problem before it starts.

## METHOD

### Participants

Each of 19 experimenters collected data for a total of 368 students-118 freshman, 78 sophomores, 88 juniors, and 83 seniors. Students were selected at their convenience. Each participant was a full time student attending Queens College in Charlotte, North Carolina, and was of traditional college age. Most participants were female (67%) and Caucasian (76%) due to the general make-up of the Queens student body, though men (32%) and other races (24%) were represented as well. These factors may have brought an element of bias into the study, however participants were representative of the student population. Each participant was treated in accordance with ethical guidelines set by the American Psychological Association (APA, 1992).

## Materials

A questionnaire on smoking habits was designed as a self-report survey concentrating on smoking habits and demographic information. Smoking habits central to this questionnaire included how long an individual has smoked, how often one smokes, and how many friends and parents of each participant are smokers themselves. Also included was information about the age, sex, and race of each participant.

The modified MMPI scale, used by Lipkus et al. (1994), was used to evaluate extroversion and unconventionality. This is a 15-item, true and false measure yielding two separate scores. Each score will be obtained by summing across all the "true" responses. Extroversion scores can range from 0-6; 0 indicating introversion and 6 indicating extroversion. Unconventionalism scores have a range of 0-9; 0 being conventional and 9 being unconventional.

Snyder's (1974) Self-Monitoring Scale was used and it is a 25-item, true or false measure evaluating self-regulation of one's actions in social situations. Scores were obtained by summing across the 25 answers. The range of possible scores is 0-25 and indicate that high self-monitoring yields a score of 15-25, intermediate self-monitoring yields a score of 9-14, and low self-monitoring yields a score of 0-8. High scoring individuals often regulate their behavior based on the behavior of others in similar situations. Those with low self-monitoring do not regulate their behavior based on that of others; instead, they behave as they want. Those with intermediate self-monitoring are a combination of both.

## Procedure

All surveys were completed individually and participants were given the option to fill out surveys either in person, with the researcher, or alone and returned through campus mail.

## RESULTS

The definition of a smoker used in this study was one who has smoked at least once in the last month. This definition is based on previous research in this area.

The first hypothesis, that there would be an increase in the number of smokers across the four college class statuses, was not supported, ( $\chi^2(3, N=367)=.74; p=.86$ ). There were 43 (36%) members of the freshman class who smoke, 29 (37%) sophomores who smoke, 37 (42%) juniors who smoke, and 32 (39%) of the seniors are smokers. These percentages indicate relatively equal percentages of students in each class who smoke.

The second and third hypotheses, suggesting that smokers are more likely to be extroverted and unconventional relative to non-smokers, was supported. The mean extroversion score was significantly higher for smokers than non-smokers,  $t(364)=3.37; p=.001$ . See Table 1 for the means of this analysis. Unconventionalism was also higher in smoker ( $M=4.94, SD=2.25$ ). The difference in these means was significant,  $t(364)=3.70; p<.001$ . These results support the contention that smokers are more likely to have unconventional personality traits than non-smokers.

The final projection of this study, that low self-monitors are more likely to smoke than high self-monitors, was not supported. Self-monitoring in smoker ( $M=11.51, SD=3.71$ ), was not significantly higher than that of non-smokers ( $M=11.22, SD=3.82$ ),  $t(364)=.71, p=.48$ .

## DISCUSSION

From looking at the results of the first hypothesis, that smoking initiation occurs in college as well as high school, it is clear that class status and smoking are not related, thus, this hypothesis was not supported. This finding is not consistent with previous research by Giovino et al. (1995) which found smoking to increase with age or grade level. Zinser et al. (1994) found that, not only was peer pressure a factor in smoking initiation in college students, but being close in age to peers was also a factor. Thus, one reason this study did not find a relationship between class status and smoking may be that individuals vary in what they consider to be "close" in age.

Another reason class status and smoking were not related may be that the student population at Queens was not a representative sample of adolescents, which would explain why the results did not support previous research.

The second and third hypotheses state that smokers are higher than non-smokers in extroversion or unconventionalism. These hypotheses were supported in this study, and are consistent with previous research. Lipkus et al. (1994) states that individuals who smoke also take part in other risky behaviors, and that those who smoke are rebellious, sensation-seeking, and impulsive. On the other hand, non-smokers tend to be more traditional and introverted than smokers. This implies that these personality characteristics may be used as predictors of smoking behavior.

Contrary to the prediction, self-monitoring personality characteristics were not a predicting factor for smoking behavior. A reason for this may be that even though self-monitoring does not predict smoking behavior, it may still have an effect on smoking behavior. For example, low self-monitors would or would not smoke simply because they behave how they want. On the other hand, high self-monitors may or may not smoke based on the behavior of people around them. Further, because individuals do not consistently choose one smoking behavior based on their level of self-monitoring, smoking probably cannot be predicted by this single characteristic. In addition, self-monitoring is a subjective measure-people choose to smoke or not to smoke based on internal factors, and on many outside forces which act together. Thus, one's level of self-monitoring can affect whether a person decides to smoke, but other forces are present which can also influence the decision to smoke. In conclusion, self-monitoring cannot predict smoking behavior because not all low self-monitors choose to not smoke, and vice versa. Simply stated, smoking behavior varies because people vary.

Due to limitations in the method of data gathering, some data may have been inaccurately reported, whether intentional or unintentional; otherwise known as reactivity. For example, a limit to this study was the small size of Queens. Because of this factor, many experimenters and participants knew each other, which, most likely, increased already existing response bias and possible reactivity.

Future research for a similar study would benefit in choosing a representative sample of the adolescent population, possible including high school adolescents as well as college students. In addition, random sampling should be used rather than sampling by convenience to give more confidence that the sample is representative of the adolescent population. One suggestion to accomplish this is to sample from state colleges, community colleges, inner city high schools, and adolescents who do not attend school etc., in addition to students who attend private colleges. Finally, experimenter and participants should not personally know one another. This will aid in the reduction of additional bias on the part of both experimenter and participant.

In conclusion, this study has shown that unconventional and extroverted personality characteristics can be used to predict smoking behavior in college students. Since results suggest that college students have already acquired the smoking habit, prevention should start early. Possibly in early adolescence, children can be tested for unconventionalism and extroversion through their school. Those children high in these traits could be in a smoking prevention program to educate them on the harmful effects of smoking.

The results of this study have provided additional information on the smoking habits of college students. These results may aid in devising smoking prevention programs for children and adolescents. Due



to much concern for the high smoking prevalence in adolescents, methods must be devised, implemented, and improved in an attempt to combat this serious problem of our nation.

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### Author Note

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### Table 1

#### Extroversion Scores for Smokers and Non-Smokers

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	<u>Extroversion Scores</u>		
	<u>M</u>	<u>SD</u>	<u>n</u>
Smokers	4.74	1.97	140
Non-Smokers	4.06	1.79	226

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