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WESTERN KENTUCKY UNIVERSITY
STUDENT HONORS RESEARCH BULLETIN
1988-1989
The Western Kentucky University Student Honors Research Bulletin is dedicated to scholarly involvement and student research. These papers are representative of work done by students from throughout the university.

James T. Baker, Director
University Honors Program
PREFACE

Once again as in past years the 1988-1989 edition of the Western Kentucky University Student Honors Bulletin demonstrates both the wide variety and practical value of research being conducted by our students.

This edition contains articles by twelve students, under the direction of nine professors from all four of our colleges. What strikes me about this collection is the interest students seem to be showing in local problems and their solutions. No better argument can be made for greater funding of higher education than this proof that Kentucky colleges—particularly Western—are training young minds to address social ills and help create a more enlightened, progressive state of the future.

My congratulations to the students and professors represented here; and I hope that their example will inspire more such work in years to come. Papers for the 1989-1990 edition may be submitted before May 15, 1989, and will be respectfully considered.

James T. Baker, Director
University Honors Program
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FRAUD AND ABUSE BY MEDICAL PROVIDERS IN MEDICARE AND MEDICAID

Vicki Gregory

When President Lyndon Johnson signed into law the Medicare and Medicaid programs on July 30, 1965, little did he realize what a Pandora’s box he had opened (Gimlin, 1975). Medicare is a federal program that provides health insurance for those sixty-five and older, while Medicaid is a federal and state program of health care for the poor (Gimlin, 1975). According to best estimates in 1963, the projected cost of the Medicare program alone might reach $9 billion by 1990 (U.S. Congress, 1981); but that figure has long since fallen by the wayside.

In 1984, the cost was almost $70 billion and it continues to grow (New York Times, 1984b). In fact, Medicare costs are rising at three times the inflation rate (U.S. Congress, 1984). Although inflation accounts for a sizeable portion of the increase, fraud and abuse are responsible for a considerable part of it. Specifically, in both Medicare and Medicaid, fraud and abuse by medical providers is a significant and pervasive problem.

Instances of fraud and abuse were reported to Congress almost from the beginning of the programs (U.S. Congress, 1981). Testimony before the House Government Operations Subcommittee in 1970 reported that the Medicare program had been overbilled by $27 million by doctors, hospitals and nursing homes during the first five years of its existence (Gimlin, 1975). Recognizing the problem and in an attempt to curb these abusive practices, Congress passed legislation establishing the Office of Inspector General in 1976 (Pepinsky and Jesiewicz, 1984) and the Medicare and Medicaid Anti-Fraud and Abuse Amendments in 1977 (Bromberg and Tiplitzky, 1983). It seems obvious that recognizing the problem and curing it are two quite different matters.

Emphasizing the scope of the fraud and abuse a report from the Senate Special Committee on Aging in 1981 stated in part that:

We have found evidence of kickbacks, ping-ponging patients from doctor to doctor, kiting bills and other abuses. Virtually every provider of category was implicated . . . . Estimates of the loss due to fraudulent activities are staggering . . . . In 1977, the committee estimated $3 billion annually was being wasted or stolen from the medicare and medicaid programs alone (U.S. Congress, 1981).

In a report to Congress the assistant director of the FBI asserted that “corruption has permeated virtually every area of the medicare/medicaid health-care industry (U.S. News and World Report, 1981).” To affirm the significance of fraudulent activities, Richard Kusserow, the inspector general of the department of Health and Human Services reported to Congress that 327 doctors and medical suppliers were removed from the Medicare and Medicaid programs for fraudulent claims in 1984 alone. This reflects a considerable increase in the number of those who were barred from the programs in 1983 (New York Times, 1984a).

In addition to federal attempts to curb fraud and abuse, a majority of states have created anti-fraud units in hopes of policing what has become a pervasive malady. Convictions were obtained in 390 cases in 1982, which represents a 62 percent increase over the preceding year (U.S. News and World Report, 1983).

According to a law enforcement official in New York state “between 5% and 20% of every New York Medicaid dollar is siphoned off by fraud and abuse.” This same official reported that “In one case, fraud was so rampant that a hospital, per se was indicted” (Modern Healthcare, 1979a). Again in New York state it was reported that 125 nursing homes had overbilled Medicaid by $8.6 million. Some of these nursing home operators used innovative ways in which to spend their illegal earnings. One bought a Rolls Royce complete with a hired chauffeur, while another used his funds to pay alimony to his ex-wife (Gimlin, 1975). Recently, undercover agents in New York were responsible for the indictments of 175 pharmacists on charges of fraudulently obtaining money from the state—some through charging for brand name drugs but actually filling prescriptions with cheaper generic drugs (U.S. News and World Report, 1983).

The recent trend toward home health care has furnished yet another area in which corrupt schemes have surfaced. Investigators revealed a fraudulent operation in Chicago concerning home health care providers who “bilked the Medicare program of more than $1 million dollars” (U.S. News and World Report, 1981).

In some areas of Kentucky, doctors abuse the system by routinely admitting surgery patients to hospitals on Saturday, even though their operations are not scheduled until Monday (U.S. News and World Report, 1983). It is doubtful that Kentucky stands alone in this practice.

In another instance of fraud, a clinic in Michigan over a two year period supposedly had performed 6,000 laryngoscopies for which it billed Medicaid. Upon investigation, the clinic returned $344,000 to the state for tests that were never actually performed (U.S. News and World Report, 1983).

Similar accounts of widespread fraudulent practices have been reported in connection with pacemaker surgeries. Senator Lawton Chiles, in testimony before the Senate Special Committee on Aging, revealed that an estimated $1 billion per year may be paid by Medicare for unnecessary pacemaker implants. He stated that:
Enough salesmen and doctors find pacemaker profits so alluring that medical experts estimate that as much as 30 to 50 percent of all pacemaker implants may not be necessary... The relationship is so close that pacemaker salesmen are actually present in the operating room, assisting the surgeon, in up to 75 percent of all pacemaker operations done in the country (U.S. Congress, 1982).

During further testimony before the same committee, it was disclosed that a small ring of California doctors in collusion with pharmacists and laboratories had defrauded about $1.5 million from the state’s Medi-Cal program (U.S. Congress, 1981). It is important to keep in mind that this was only one small ring which had been caught and which operated over a period of only a few years. As an overall picture in California, the report estimated that as possibly high as “a couple of hundred” million were lost to fraud in the state’s Medi-Cal program alone (U.S. Congress, 1981).

In addition to the overall picture, there are numerous instances of individual medical care providers committing fraud or otherwise abusing the system. Some of these instances are remarkably innovative; others would be quite humorous if they were not so serious. Still other cases cause one to wonder at the sheer audacity of some professionals in their attempts to cheat the programs.

For example, a Massachusetts psychologist billed the state’s Medicaid program in one month for more than 1,800 patients whom he had not treated. For this indiscretion he received a four to five year prison sentence. Along the same line, a surgeon in a well-known California hospital sent Medicaid a bill for open heart surgery that he had not performed. Accordingly, he was convicted of grand theft (U.S. News and World Report, 1983).

In Maryland, a dentist, apparently thinking his Medicaid claims would be reviewed only casually, billed the system for numerous false claims—the most interesting one was for a tooth extraction on a patient whose teeth had been removed previously. As might be expected, he was subsequently jailed for fraud (U.S. News and World Report, 1983). Another dentist, in an attempt to cheat the government, extracted “thirty-two impacted wisdom teeth from one patient because the government paid more for the removal of impacted teeth than it did for pulling normal teeth” (Pepinsky and Jesilow, 1984). It appears that his audacity was only exceeded by his greed.

In Illinois, an optometrist was required to pay damages of $2.2 million to Medicare and Medicaid for “hundreds of fraudulent medical claims” (U.S. News and World Report, 1983). Going well beyond fraud was a greedy ophthalmologist who could have seriously injured or killed his patients: he was caught for performing cataract surgery “on healthy eyes because the government would pay $563 for each eye” (Pepinsky and Jesilow, 1984).

In another example of fraud, a nursing home in Ohio was found guilty of false reports to Medicaid. In this particular case the nursing home simply inflated each charge by obviously rounding off figures. For example, $10,000 was tacked on to salaries, $5,000 to food and $2,000 to depreciation. In one year alone, this nursing home blatantly overcharged the government by $88,000 (Modern Healthcare, 1979B).

Varying the method of fraudulent schemes, a California psychiatrist billed Medi-Cal for individual sessions but treated the patients as a group. For this inventive activity he was jailed (Gimlin, 1975). In another instance of cheating Medicare, an orthopedic supplier in New York was indicted for false claims totaling $200,000 over a two-year period (New York Times, 1983b). A similar indictment accused a former chief of radiology at the Jersey City Medical Center in a scheme to defraud Medicare and Medicaid for work he never performed (New York Times, 1983a).

Another provider of medical care who was convicted of Medicare fraud is Dr. Richard Kones who practiced in New York and Texas. The case is of particular interest because Dr. Kones was a successful cardiologist and publisher of several well-received books and articles on his specialty. In 1977 Dr. Kones billed Medicare for over $1 million in fraudulent claims. These claims involved about forty elderly patients who were treated a few times for minor ailments, but the bills submitted to Medicare were for complex, expensive surgical procedures and for numerous visits (U.S. Congress, 1981).

One of the more extravagant cases of fraud involved a podiatrist in Illinois who sent the government a bill for $13,000 for foot surgery when all he had done was trim toenails and remove calluses (U.S. Congress, 1981). Another instance evidencing abusive practices was the doctor who treated a patient for a broken thumb and charged the government for $300 worth of blood analyses. However, this pales in comparison to the gynecologist who swindled the system out of $2 million by double billing and performing so-called abortions on women who were not pregnant (Medical World News, 1980). Another exotic case of fraud concerns a couple of psychiatrists who “were found to have been having sex with patients and charging the government for the pleasure” (Pepinsky and Jesilow, 1984).

Probably the most presumptuous instance of those related is the case of Dr. William Greco, owner of a nursing home, who was convicted of several charges of Medicaid fraud. One of the most inventive of the charges for Dr. Greco’s bill for $110,000 for “a transparency of a nude woman on a highway.” It seems Dr. Greco and a partner purchased the photo intending to reproduce it as rare art and then claim a deduction for depreciation. Of course that would have been an accepted business practice, but charging it to Medicaid, as the Maryland Assistant District Attorney General said, “was not terribly nice” (Schreiber, 1984).

Although many of the aforementioned cases involve considerable amounts of money, in the overall view of fraud and abuse, in Medicare and Medicaid, what really is responsible for the huge losses are doctors who are “nickel-and-
diminishing the program.” By routinely ordering unnecessary tests and upgrading procedures, costs are greatly inflated. Recent estimated losses due to fraud and abuse account for 10 percent of every health-care dollar paid by the government Medicare and Medicaid programs. That translates into more than $7 billion in losses each year (Pepinsky and Jesilow, 1984). By anybody’s yardstick, that is a staggering figure.

One reason why losses of this magnitude occur is that very few safeguards were built into the programs. Apparently federal legislators assumed that the medical profession was too honorable to cheat. In light of ever increasing revelations of professional fraud, one hopes that legislators have since changed their minds. Another compelling reason for the losses is simply the huge size of the programs that makes them difficult to administer. Medicare now assists over 30 million Americans—27 million elderly and 3 million disabled (U.S. Congress, 1984). The complexity of the system itself leaves it vulnerable to abuse. Further, the government agency created to police the system admits that they have a shortage of investigators and too much red tape (Medical World News, 1980). Many observers believe that from the beginning poor management is one of the major reasons for abuse of the programs (U.S. News and World Report, 1983).

Reinforcing the above views, Senator John Heinz in testimony before the Senate Special Committee on Aging stated that:

Frauds against the Government continue to be lucrative and pervasive. The odds against getting caught and punished are extremely inviting . . . . The public purse is open and easy, the bureaucracy too ponderous and passive to pursue (U.S. Congress, 1981).

The previously mentioned Dr. Kones admitted to senate investigators that the system was very easy to evade. In many instances he simply ran off copies of bills on a duplicating machine and submitted them for payment. Moreover, he stated that the forms he sent in were “absolutely outrageous” and when he related his techniques to others they found it “a source of merriment.” He further stated that at one time he submitted forms with sixteen different “flags” or alerts on the forms but still received payment for them (U.S. Congress, 1981).

In addition to considering the reasons for abuse, some reflection should be given to who pays for these abusive practices. The cost is awesome but not only in terms of money. When doctors perform unnecessary tests and operations, they expose the patient to injury or even death—to say nothing of causing unneeded suffering. Some relevant examples of these procedures are the aforementioned pacemaker and cataract surgeries.

Additionally, there are reports of nursing home operators who charge Medicaid for patient services which are reduced or not provided. For example, some unscrupulous operators actually recycle untouched portions of patients’ meals (Gimlin, 1975). Obviously, in these instances the patients are the ones who bear the brunt of these fraudulent activities. Of course, in terms of dollars, it is the average citizen who eventually pays the bill.

Considering the amount of the loss, what can be done to force medical providers to abide by the law? Improved management, stricter controls, effective policing—all these would certainly be helpful; but until the public becomes aware of the problem and demands corrective measures, the abuse will no doubt continue. It will take many more people like Mrs. Madeline Garmon of Florida, who wrote to her senator revealing a Medicare ripoff by medical providers concerning her own pacemaker surgery. Concluding her letter, Mrs. Garmon stated that her experience was “one of the ways Medicare is being milked, and I am incensed over it (U.S. Congress, 1982).

No one denies that the objectives of Medicare and Medicaid—the attempt to provide quality health care for the aged and needy—is a commendable goal. The problem is that far too many medical providers have routinely, blatantly and pervasively abused the system. Perhaps what is required to solve the problem is more concerned citizens like Mrs. Garmon to become “incensed over it.”

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THE EFFECTS OF PERSONALITY TYPE AND SOCIAL SUPPORT ON INSTANCES OF JOB STRESS

Becky Frew

Job stress and its relationship to both individual and organizational performance has become an increasingly important area of study in recent years. Because of the generally adverse personal and organizational outcomes of stressors, and the concurrent difficulty of eliminating these stressors from organizations, increased attention has been given to the exploration of variables that might moderate this relationship, thus reducing negative health and job outcomes. Among the kinds of variables that have been empirically identified as potentially important moderators of the effects of job stress, two have received considerable attention: social support and personality type (Ganellen, 1984).

Most research to this point has considered the stress-reducing effects of social support and personality independently (Ganellen, 1984). However, rather than view social support and personality types independently, it may be fruitful to consider their interrelations. But in other terms, might it not be that social support and personality types are two sides of the same coin: the interpersonal and intrapersonal sides of the coin of coping resources?

The purpose of this paper is to test a three-fold hypothesis and explain the interrelationships between social support, personality types, and job stress. The dependent variable is job stress and the independent variables are social support and personality type. The first hypothesis is that the presence of social support from supervisors, co-workers, and spouses will be negatively correlated with job stress; secondly, the presence of hardness or internal locus of control will be negatively correlated with job stress, and Type A personality type will be positively correlated with job stress; thirdly, social support and certain personality types will combine to reduce the negative effects of job stress.

Social support has been defined in several ways. It has been generally characterized as the degree of support provided to individuals, particularly in times of need, by the persons involved with them—spouse, family, friends, neighbors, supervisors, and co-workers (Genellen, 1984). These social networks serve multiple functions in helping one adjust to the demands of the environment. Involvement in a network helps individuals by providing information concerning what is expected of them, feedback regarding their behavior, assistance with tasks, and rewards for appropriate behavior.

Although the research concerning social support has investigated the moderating influences of resources available to the individual from the surrounding environment, another line of research has focused on the resources the individual possesses: personality characteristics. The three types of personality considered in this paper are hardness, Type A, and internal locus of control.

Hardiness is a personality type that can be viewed as the ability to survive very stressful events and remain healthy. The Type A personality type is seen as a lifestyle of behavioral responses characterized by extremes such as competitiveness, pressures for advancement, intense striving for achievement, and aggressiveness; it has been demonstrated to be linked with physical and medical symptoms of anxiety, depression, and work outcomes such as job dissatisfaction and job tension (Abush, 1984). Internal locus of control is a personality type that concerns the feeling and belief that events may be influenced rather than feeling helpless when confronted with adversity.

Interest in on-the-job stress was recently stimulated by research funded by the National Institute for Occupational Safety and Health (McGee, 1983). These researchers articulated the “buffer hypothesis” and refined the operationalization of social support. The buffer hypothesis explains interactions between job stress and social support by proposing that job stress will be weaker for those enjoying a high degree of social support (McGee, 1983). The researchers differentiated the supervisor, co-workers, and spouse as distinct sources of support. Pinneau (1982) found that social support had direct effects on job stress reduction, but he concluded that the inconsistency of the nature of the significant interaction effects refuted the buffer hypothesis.

Subsequent work cast additional doubt on the notion that job stress would have less negative effects for individuals with high social support. Beehr (1983) studied supervisory support as a moderator of the negative outcomes of role ambiguity, a source of job stress. Results were mixed and inconsistent. LaRocco and Jones (1983) examined supervisor support and work group cooperation as moderators of the relationship between a composite ambiguity and job satisfaction. They found little support for the buffer hypothesis, but clear evidence of direct relationships between these support variables and satisfaction.

Conflicting evidence kept the issue alive. House and Wells (1983) found evidence for buffer effects with supervisor support, but not with co-worker support.

However, in the last two years, considerable affirmative evidence is mounting with regard to the underlying assumptions that social support from co-workers, supervisors, and spouses can reduce job stress. For instance, several researchers have reported negative associations between co-worker support and job stress (Davis-Sacks, 1987). Numerous studies, including some that simultaneously examined co-worker support and job stress, have examined the association between supervisor support and job stress (Etzioni, 1985). With one exception, the data from these studies sp-
hold the hypothesis that supervisor support is negatively associated with job stress. Finally, studies of male workers in a manufacturing firm and in other occupations suggest that spouse support is less likely to affect job related reactions than is supervisor or co-worker support (House, 1986).

Although it is tempting to generalize these findings, House (1986) warns against generalizing from such findings across occupations. He concluded from his review of social support studies that the person who can give a worker the “most effective support depends on the kind of work the worker does, and the kind of stress it imposes” (House, 1986, p. 713). And co-worker support may have minimal impact, according to House (1986), on job stress in occupations in which interactions with co-workers are limited or in occupations in which co-workers can’t do much to alleviate job stresses.

To the extent that overall patterns may be discerned, it is clear that job stress has been found to have a generally unfavorable impact on workers and that social support has been found to have a generally favorable impact on workers. Therefore, evidence has been found for the first hypothesis. It is suggested that the inconsistency of the earlier findings is a likely product of the wide variation in the operationalization of job stress and social support variables and may have led previous researchers to conclude falsely that stress and support do not interact (House, 1986).

Since 1982 three longitudinal studies in which job stress level and hardness were variables have been published (Kobasa, Maddi, & Kahn, 1982; Kobasa, Maddi, & Courington, 1982; Kobasa & Pucetti, 1983). The positive effect of hardness was found in all three studies; and the interaction between job stress and hardness was significant in one analysis (Kobasa et al., 1982). The evidence suggests that the hardy personality type may function to diminish the potentially negative effects of job stress.

A significant relationship between Type A personality and job stress was found in a study of mid-life working people (Abush, 1984). This suggests that the more extreme a person’s Type A personality, the more likely he is to perceive tension at work. This finding together with other recent research (Boggs, 1984; Highland, 1985; Adams, 1986) indicates that a positive relationship exists between job stress and a person’s Type A personality.

Several studies recently have shown a negative relationship between internal locus of control personality type and job stress. For example, Duckitt (1984) studied locus of control as a moderator of the negative outcomes of job stress and found negative associations between internal locus of control and level of job stress. Evidence suggests that the internal locus of control personality type may function to diminish the potentially negative effects of job stress.

At the beginning of this paper it was noted that most studies considering social support as a job stress buffer have not also considered personality types and vice versa. This is a relatively new area of research. Three studies have recently appeared which have, to an extent, done so (Sandler & Lakey, 1982; Kobasa, 1982; Kobasa & Pucetti, 1983). Sandler and Lakey (1982) considered the effects of locus of control and social support together on job stress and concluded that the co-occurrence of high support and internality together buffered stress effects. Kobasa (1982) considered the effects of hardness and social support together on job stress and obtained no interactions; this must, however, be seen in light of the fact that an exceptionally limited index of support was used. Finally, Kobasa and Pucetti (1983) considered the effects of hardness and social support (from boss and spouse) together on job stress and found that social support from boss and spouse decreased stress effects in high-hardiness subjects.

Thus it appears that the amount of social support, certain personality types, and job stress level are all interrelated. In fact, high social support and certain personality types have the effect of reducing job stress.

Since an individual’s personality type generally cannot be changed, several recommendations are offered to increase the amount of social support, thereby decreasing the level of job stress. Supervisors should watch for signs of job stress and provide understanding, advice, and feedback when symptoms of job stress begin to appear. Workers should be encouraged to meet with each other to talk through their problems either informally or formally in workshops or in leaderless support groups.

Increasing support is not the only effective way to reduce undesirable job stress, however. Redesigning jobs and increasing the participation of workers in organizational decisions may be more effective, particularly if such efforts directly address the underlying causes of job stress.

REFERENCES


Sir Gawain and the Green Knight is considered one of the most outstanding of English romance poems. It not only contains all the elements of the traditional romance but also has an added dimension. The poem is dualistic in the sense that it also contains elements of humor and realism. Rather than undermining the romantic nature of the poem, however, these elements serve to strengthen it by providing a fruitful contrast to its ideal features.

It is evident from the outset of the poem that it is a romance. The narrative begins with an expansive historical backdrop which relates Sir Gawain and the Green Knight to the broader English romantic tradition. This historical prologue, which spans British history “from Camelot to Troy,” establishes an arena within which the events of the narrative unfold. This is an effective strategy because, although it sets a romantic tone, it also lends some historical credibility to Sir Gawain and the rest of King Arthur’s court.

The author relates the residents of Camelot to Felix Brutus, the legendary founder of Britain—a place where “bold boys (were) bred . . . in broils delighting/That did in their day many a deed most dire.” We are further informed that “of those that here built, of British Kings/King Arthur was counted most courteous of all.” With these lines King Arthur and his court become firmly entrenched in the British romantic heritage and the mood is set for Sir Gawain’s adventure.

Right away the poet heightens the reader’s burgeoning sense of romanticism through a glowing description of Christmas at Camelot. The halls of the castle echo “with feasting and fellowship and carefree mirth/For the feast was in force full fifteen days/With all the meat and mirth/That men could devise/ Such gaiety and glee, glorious to hear/Brave din by day, dancing by night/High were their hearts in halls and chambers/These lords and these ladies, for life was sweet/In peerless pleasure passed they their days.” Their description invokes visions of dizzying pleasure and rampant hedonism.

But before the reader can catch the breath he has just exhaled in a wistful sigh, the author informs him of the perfection of character of those gathered at Camelot. Surely “the most noble knights known under Christ/And the loveliest ladies that lived on earth ever/And he the comeliest king . . . King noblest famed of will.” deserve such pleasures.

With these superlative descriptions of the Arthurian court, the author creates the ultimate romantic tone. After reading the first two pages of the poem, the reader is prepared to encounter all of the elements of romantic literature and lose himself in a world of grandeur, pageantry, virtue, and adventure. But just when these expectations are established, the author introduces a twist into the traditional plot.

Into the midst of the smooth workings of the lavish feast, a great green monkeywrench of a knight is thrown. Suddenly the atmosphere in the dining hall changes from one of brotherhood and contentment to one of surprise and disbelief.

The Green Knight, too, is described in superlatives. But his wonders lie not in his demeanor or his fresh countenance. He is described in terms of his outlandish features. Initially, the diners are so amazed at his size—“from broad neck to buttocks so bulky and thick/And his loins and his legs so long and so great/Half a giant on earth (they) hold him to be”—that they fail to associate the color of his skin, clothes, and horse with the green vegetables on their plates.

The Green Knight’s manner is also a source of incredulity for those assembled in the hall. The large green intruder wastes no time with formalities, shunning Arthur’s invitation to “leap lightly down, and linger.” The knight’s brusque, grandiose attitude offers a striking contrast to the polite formality of the feast guests, as evidenced by his reply to Arthur’s offer of a fight. “Nay,” he answers, “to fight, in good faith, is far from my thought/There are about on these benches but beardless children/ . . . Measured against mine, their might is puny.” Instead, he wishes only to issue his challenge, have his head chopped off, and leave.

The Green Knight’s immense size, ridiculous hue, and “exaggerated buffoonery” in stating his challenge detract from the solemnity of the tone which the author initially establishes. This type of contrast reveals and enlarges its affirmation of romance values. Contrasting scenes like this recur throughout the poem. In one episode the poet constructs a tone of classical romantic proportions; then in the next he introduces an unromantic element which offsets the tone of the preceding scene.

Humor, however, is not the only device against which the author balances the romantic tone of the poem. He also-instills in some scenes a graphic sense of realism. This is most evident in the poet’s description of the harsh weather which Sir Gawain endures as he searches for the Green Chapel. “When the cold clear rains rushed from the clouds/And froze before they could fall to the frosty earth/Near slain by the sleet he sleeps in his irons/More nights than enough, among naked rocks/Where clattering from the crest the cold streams ran/And hung in hard icicles high overhead.” These lines relate vividly the harsh, cold medieval winters. The poet further enhances this realistic tone with the image of “many birds unbithite upon bare twigs/That perched most piteously for pain of the cold.” In my experience with English literature, this image is rivaled only by the limping hares in Keats’ “Eve of St. Agnes” in its realistic evocation.
of the cruelty of winter.

The stark realism of the winter journey contrasts the "mock-serious tone of Arthur's warning." to Sir Gawain to "take care . . . that your courage wax not cold/ When you must turn again/ To your enterprise foretold." This warning is prompted by Arthur's sense of propriety and patronage. The king is radiant in the glow of his gallant knight and basks in an atmosphere of romance.

The poem's theme of romanticism versus unromanticism culminates in the contrast between the atmosphere at the castle where Sir Gawain spends Christmas and that set at the Green Chapel. The author's descriptions of the castle are as lush as those applied to Camelot at the beginning of the poem. As Sir Gawain is ushered in, he beholds "heavy silk hangings hemmed all in gold/ A canopy over the couch, clad all with fur/ Curtains running on cords, caught with gold rings/ (and) Woven rugs on the walls of eastern work." As the reader drinks in the finery of this scene, he once more experiences the romantic giddiness lost during the winter trek.

The adventure of the hunt scenes evokes romantic images as well. In these the reader sees the brighter side of nature, as opposed to its earlier bleakness. The animals killed by the huntsmen provide not only food but also the opportunity for brotherhood and merriment for the members of the court. Consequently, nature is portrayed in a positive light by the poet as he describes the hunt. "The echoing horns repeat/ Clear in the merry weather . . . The lord, now here, now there/ Spurs forth in sheer delight/ And drives, with pleasures rare/ The day to the dark night." Once more the romantic mood permeates the verse.

But once Sir Gawain sets out for the Green Chapel, the tone again shifts to realism. Nature assumes its previous fearsome countenance as he nears the Green Knight's abode. "The landscape was wild . . . With many a ragged rock and rough-hewn crag/ The skies seemed scored by the scowling peaks." The ultimate opposition to Sir Gawain's knightly valor, which is the very embodiment of romanticism, is his embarrassment at the hands of the Green Knight. After having barely drawn blood from Sir Gawain's neck, the Green Knight explains the ruse behind the challenge. The contest is merely a test of Sir Gawain's virtue—one that proves that no knight, however noble, is perfect. Though Sir Gawain is shamed by what he views as his failure, the Green Knight praises him for what he has accomplished and excuses his one slight fault. Sir Gawain is initially embarrassed by his shortcoming, but he eventually realizes that he is now a better knight, having overcome his excessive pride.

This may seem to the reader a most unfitting ending to a romantic poem but for Sir Gawain and the Green Knight, it is not. The final scene is merely an extension of the theme which pervades the poem—that of romanticism versus unromanticism. Each element of the poem is set off by a contrasting element and in this manner a meticulous balance is maintained throughout the narrative. The larger thematic contrast is created by smaller contrasts within each of the characters as well as setting and tonal contrasts. The Green Knight proves himself a good host during the Christmas celebration in spite of his treacherous intentions. Sir Gawain must possess an unromantic characteristic to balance his character as an ideal Knight, or the carefully planned symmetry of the poem will be disrupted.

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EARTH SHELTERED HOUSING

Laura Green

One of the most important basic decisions made during adulthood is the choice of shelter. Consumers must choose whether to rent, buy, or build a home. Once this decision has been made, consumers must then decide what form of dwelling will fit their personal wants and needs. Consumers must also consider affordability as well as what housing form will be appropriate for the location in which they choose to live.

One form of housing that is regaining popularity in many rural and suburban areas is earth-sheltered housing (ESH). Prospective consumers of earth-sheltered homes have a variety of options to consider, along with a considerable amount of research to review. The first step consumers should take is to question the practicality as well as history of this type of dwelling. Consumers will find that ESH is far from being a modern approach to housing. Cave men and North American Indians sought shelter from weather and wild animals in openings in the ground. The earliest European settlers in North America lacked ready-to-utilize building materials (1:43) and chose natural earth-sheltered dwellings to meet their immediate housing needs.

A 1979 on-site study and photography of Middle Eastern Bedouin shepherd families reveals their centuries old practice of moving from portable goat skin tents during hot summer days to cooler cave-like housing. Conversely, during the coolest winter nights these nomads found that the earth's stable temperatures were more comfortable than that of a tent (2). Modern consumers have chosen underground shelter for privacy, energy efficiency, temperature control, and various other functional, economic advantages. Earth-sheltered housing is not new, but it is practical for the purpose of providing modern shelter needs.

Consumers will find from a review of literature that modern earth-sheltered homes are usually built into the side of a slope with a southern wall exposed (3:328). This practice ensures 1) capturing heat energy from the sun during the winter and 2) preventing excessive wind exposure and the resultant winter heat loss. Summer comfort of the occupants and concomitant minimizing of heat gain can be successful if an adequate roof overhang is employed to shade the south wall. These considerations are integral to the question of site selection.

Site selection, however, is much more extensive than finding a hill that provides a southern exposure. Other priorities include 1) testing the soil type in order to ascertain information for proper structural design, 2) checking the groundwater conditions for selection of appropriate waterproofing and drainage techniques, 3) measuring typical temperatures for use in designing shelter for thermal comfort, and 4) relating the topographic slope of the land to the design style and size chosen. These data may be obtained from reliable sources such as city engineers, soil-testing firms, and owners of neighboring properties who have previously obtained similar information. If the results of the preliminary investigation are satisfactory, a detailed site investigation should be completed before the land purchase is finalized (4:25-26).

Once site selection is completed with a southern exposure, located preferably in a mild climatic region, consumers can analyze their household energy usage needs (energy demand) which is to be supplied by solar heat gain. If a direct passive solar heating system is to function properly, adequate glazing (windows) must be specified on the south wall. These windows should be heat transmission resistant (double or triple paneled), with exterior shading devices to control the amount of heat loss or heat gain. Secondly, correctly-sized thermal mass must also be designed, isolated from exterior winter air and ground, to store the heat (5:82). A typical way for successfully incorporating thermal mass storage is to utilize concrete walls and/or floors. A third consideration by consumers is utilization of open room arrangement (open-space planning) to facilitate the imperative but natural free flow of energy gained. Open space planning with few interior walls typically limits walls to the private-rest zone. Finally, ensuring adequate ventilation of air throughout the dwelling unit is an important strategy.

Another high-priority factor for consumer evaluation is alternative construction techniques and the concomitant analysis of the structure for soundness and humidity control. A review of relevant literature reveals that concrete seems to be the preferred material for construction because of 1) its strength, 2) ease in waterproofing, 3) ready availability, and 4) a widespread abundance of experienced construction personnel (5:109). Consumers, in this phase of their research, must plan the 1) excavation process, 2) the actual construction of the dwelling unit, 3) the exterior retaining walls, 4) the foundation and critical roof loads, 5) proper waterproofing and insulation, and 6) backfill processes. These details must all be checked with the appropriate professionals in order to guarantee congruence with the requirements of local building codes and to ensure physical safety of the structure.

In this planning stage, consumer decision making involves the development of a practical, functional, safe, efficient, and aesthetic building design. Consumers, therefore, may consider the type of interior layout and select aesthetic finishes to compliment a new home. According to one source, however, "Few home-builders perceive it easy to obtain earth-sheltered designs that consumers find psychologically easy to live in" (6:150).
Earth sheltered homes that open to daylight only on the south wall pose some limitations relevant to layout design. Bedrooms and living spaces should be located on the south side to provide the numerous windows which must comply with building codes. Thus bath, kitchen, mechanical, and storage areas should be located on the north wall. If these heat-producing areas are placed along the cooler north wall, then more even interior temperatures can be maintained. The kitchen and dining spaces should be on the north wall, but they should have few barriers from the living space if they are to benefit from the heat absorbing window areas (4:38).

To discourage the psychological feeling of being held captive, consumers may want to specify a higher ceiling than is used in standard practice. Using pastel hues tends to enlarge rooms as well as enhance appearance. Open space planning is useful in creating spaciousness as well.

During the planning phase, consumers often make decisions concerning the access from the exterior and provisions for ample exterior space for parking and maneuvering cars. This decision, therefore, leads consumers into the landscape designing phase of their research. One of the main advantages of an ESH is the opportunity to integrate the visual beauty of natural surroundings with the functionality of the home. Preserving as much of the natural surroundings as possible can contribute to a well-blended appearance and can provide a beautiful, natural view through the south facing wall of windows.

Other relevant issues impending on the consumer choice of an ESH are initial costs and financing. Initial costs, as with conventional homes, differ according to floor plan and architectural design, site chosen, and builder employed. Initial costs contrasted with conventional housing can be higher for an ESH because of the increased structural support, waterproofing, earthwork, and landscaping involved. However, these initial costs can be offset in the long run by the greater operating efficiency and other energy related advantages.

According to one university housing specialist, "Many of the homes have been primarily owner financed." This is due to two factors. Money lenders are concerned with the possible resale value of an ESH and appraisers cannot apply standard appraisal techniques to an ESH. Most appraisers are unfamiliar with this type of structure (7:37).

Other priorities that must be deliberated prior to ESH construction are public policy issues. Specific building codes must be adhered to, such as those pertaining to light, ventilation for all habitable rooms, egress, and fire safety of sleeping areas. Zoning codes may prevent the building of an ESH in selected communities. Insurance coverage available for earth shelters have been varied. Coverage ranges from low rates in some regions, to comparable rates for conventional homes in other areas, and to refusal of coverage by some companies (4:235-236).

In viewing the advantages of an ESH, the consumer might decide that consistency of interior temperature is at the top of the list. The interior temperature of an ESH remains more constant than that of above grade homes. Thermal uniformity is possible because ground temperature in the United States remains approximately 5 degrees Fahrenheit year-round. The exterior temperature above grade could fluctuate by as much as 100 degrees in one year, and by 30 degrees in one day. In contrast, the most constant temperature of the earth makes for ease and economy of heating and cooling an underground home uniformly (3:329).

In an evaluation of ESH by one popular source of consumer information, numerous advantages were cited. For example, 1) there are substantial energy savings on potential heating and cooling bills, without incorporating the use of expensive or unusual high technology, 2) ESH provides increased yard space for personal pleasure, as well as 3) parklike views for occupants and neighbors. 4) The mass of earth surrounding the house deadens sounds and vibrations, leaving ESH interiors remarkably quiet and private. 5) In comparison with conventional housing, the fewer exterior surfaces of ESH require less outside maintenance time and financial outlay. 6) Interiors are quite free of drafts and dust because earth sheltering minimizes air infiltration. 7-9) Masonry ESH are less susceptible to fire risk, rot, and termites when contrasted with conventional wooden dwellings. 10) Earth also better protects occupants from ravages of a variety of storms (hail, wind, tornados, and hurricanes) (8:3). Finally, 11) long life expectancies and 12-13) comparative protection from power outages and frozen pipes attracts potential occupants.

Although the advantages of ESH appear numerous as well as significant, and although these advantages have been important historically, it is equally important for the consumer to evaluate the potential disadvantages of ESH. Two possible disadvantages which have already been cited are that of acquiring adequate financing and that of finding a suitable building site. Another disadvantage of ESH is regional drawbacks due to climatic extremes (3:27-30). An ESH also has selected social and legal constraints, which were previously cited in the public policy paragraph. Among tradition-oriented consumers, earth shelters pose selected design constraints. Because an earth-shelter is usually horizontally oriented, it necessitates land in one direction. Higher initial costs may be a problem for consumers, though these costs may even out in the long run. There is potential for resale difficulty of an ESH due to the rigid housing expectation patterns (norms) and housing design conformity in society. Consumers can experience difficulty finding contractors educated and experienced in building these homes efficiently and professionally. Finally, cost of location and repair of leaks can be formidable for ESH occupants.

After examining the concepts integral to ESH and comparing relevant advantages with potential disadvantages, consumers reach the decision phase of their research. They can decide if this form of housing will be functional, efficient, comfortable, and satisfactory for personal/family shelter needs. According to one reliable source of ESH consumer information, the public is often reluctant to
compromise personal concepts of design to achieve cost or energy savings. "It is, therefore, imperative that all four issues of design be balanced so that 1) beauty and 2) quality of space not be sacrificed in 3) cost cutting and 4) energy savings" (9:424). Earth-sheltered housing is one unique way consumers can resolve all four issues of design in one satisfactory dwelling. This updated housing form has a centuries long history of success. ESH is also beginning to flourish in central and southern United States as a vital part of a technological society. Today consumers can choose the earth-sheltered housing from an array of modern housing forms. On balance, cost-effective ESH is a viable housing form for selection during a period when inflating initial housing and operating costs become increasingly critical to all American consumers.

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CAN THE WHITE ASH TELL? A CASE STUDY IN DENDROCHRONOLOGY

Layne Price Mason

The method of extracting information from tree rings has given rise to the discipline known as dendrochronology. It is well known that counting the number of rings in the trunk of a tree is a way of determining the age of the tree (Fritts, 1972). However, measuring the width of tree rings may suggest that there could have been changes in the surrounding environment that affected the growth of that particular tree.

The science of dendrochronology was used in the 1930's as researchers sought relationships between tree-ring records and precipitation with the hope of uncovering evidence of cyclic behavior that would allow them to explain and predict droughts (Davis and Sampson 1936; Keen 1937; Antevs 1938). Since then a number of studies have evolved using the correlation between the width of tree rings and data from geomorphic hazards including flooding, snow avalanches, mass movements, and permafrost heaves (Butler, Malanson, and Oeleske, 1985).

According to Charles F. Baes III and Samuel B. McLoughlin (1984), the presence of particular tree elements in tree rings may be a useful indicator for past and present air pollution episodes. Their study of annual growth rings from short-leaf pine trees in eastern Tennessee showed increasing metal concentrations since the 1950's and possibly related decreases in growth during the 1970's. In samples taken from older trees in the Great Smoky Mountains National Park, Baes and McLoughlin (1984) were also able to see evidence of the effects of a copper smelter that operated between 1863 and 1912.

In a study done by Jacoby and Ulan (1983), there was a correlation between tree rings and the history of major earthquakes. In the Icy Cape in the Yakataga, a seismically active region of Alaska, they found that until 1899 most of the trees were on the shoreline. During 1899, when a strong quake is known to have occurred, the land was uplifted, and since then the trees have lived in a relatively protected environment, a condition displayed by the more rapid growth rate revealed by the rings (Jacoby and Ulan, 1983).

According to Fritts (1972), it should be emphasized that not all trees are suitable for dendrochronology. A tree that grows in a benign climate, always having an adequate supply of water and favorable temperatures, is not likely to show much variation in its annual ring growth. Keeping this in mind, it was the purpose of this study to examine the tree rings of a White Ash tree and compare its annual rings with the temperature and precipitation data gathered through the same period of time.

Taking into consideration the uncertainty that the type of tree being used for this study was appropriate, and knowing that Kentucky's climate was favorable for the growth of vegetation, this researcher formulated the following hypothesis:

There is a correlation between the annual May and June precipitation and temperature data collected and the corresponding annual width of the tree rings from the White Ash tree.

In the hypothesis stated, it must be noted that the annual growing season for the White Ash is during the months of May and June (Winstead, Personal Communication, 1987). This study was conducted in Bowling Green, Kentucky, on Western Kentucky University's campus. The tree that was used in this study was located next to the Snell Hall parking lot (downhill from the Environmental Science and Technology building).

The ideal nature of Kentucky's climate is apparent in its agriculture, where production is seldom seriously limited by weather factors. The regular movement of low pressure systems across Kentucky during winter brings frequent precipitation to all sections. During the summer, the showers which develop bring generally ample rainfall from June through August (Hill, 1971).

As well as taking into consideration the effect of Kentucky's climate, two other factors played an important part in the preparation for this research. Those factors included the knowledge that the Snell parking lot was constructed in the early 1960's (Physical Plant Employees, Personal Communication, 1987), and that 1980 was the year that the tree was cut down (Conner, Personal Communication, 1987).

To complete this research, two sets of data were necessary. The first entailed measuring the width of the tree rings in a precise and accurate way. The other was to find the corresponding precipitation and temperature data. The methods used in finding the needed information for this study can be summed up in the following steps:

**Step 1: Location and Orientation of the White Ash**

A compass had been used at the site where the White Ash tree once stood. On the cross-section of the tree, the directions were marked accordingly.

**Step 2: Tree Preparation**

In order to make the tree rings readable, a strip across the cross-section of tree was sanded. A belt sander was used to perform this step.

**Step 3: Counting the Tree Rings**

In this particular White Ash 102 rings were counted. However, in counting those rings this researcher had to be on the lookout for "false" or "double" rings. For example,
a tree may appear to produce more than one ring a year. According to Fritts (1972), the dendrochronologist must be alert to such possibilities. He can spot those difficulties by examining the simultaneous occurrence or lack of synchrony in the rings' cell structure in all of his specimens. However, what makes this study difficult is the use of only one particular specimen, the White Ash tree. In previous studies, only evergreen conifers such as firs and pines were used. The only exception was a study done in 1972 with the Blackjack and Post Oak specimen. Through that study there were no "false" or "double" rings found in any of the samples examined (Johnson and Risser, 1972). Since the Post Oak is considered a hardwood, it is the assumption of this researcher that there are very few anomalies such as "false" or "double" rings in the White Ash being examined.

Step 4: Measuring the Tree Rings

In measuring the tree rings, these tools were needed: 1) a divider (a two-point measuring device); 2) a magnifying glass; 3) a ruler with precise measurements to 1/62 of an inch; 4) map pins to mark the last measurement; 5) and a ledger book to record the data.

Step 5: Collecting the Meteorological Data

After measuring each individual ring and recording its measurements, it was then time to gather the climate data needed from the College Heights Weather Station. From the year 1955 through 1979, the May and June precipitation and temperature data from each year was collected and recorded.

After collecting and recording all the tree width and climate data, it was then time to see if there was any correlation between the precipitation and temperature data and the width of the rings that had been measured. After averaging the two profiles taken from the cross-section of the tree, the points were then plotted in reference to the given year. After taking the average temperature data, a double-axis graph was then constructed to show the comparison between the two. It was evident after the graph was completed that there was little if any correlation between the temperature curve and the ring width curve. However, it was interesting to note that in 1961, the year the Snell parking lot was constructed, the width curve had an extremely large ring. The next step was attempting to find some correlation between the tree ring width curve and the average precipitation departure from normal curve. Again in 1961, there was a definite correspondence agreement between the precipitation data and tree ring width. However, other than some minor correlation after 1973, there was little if any agreement overall.

A statistical correlation was calculated for the tree ring width versus temperatures resulting in an r value of 0.008. Tree ring widths versus precipitation yielded another poor correlation coefficient r-0.021. The statistical analysis supported the graphic analysis: that is, White Ash rings are unable to depict changing climate conditions.

This researcher failed to confirm his hypothesis.

Kentucky's generally benign climate and the uncertainty that the White Ash was appropriate for this study made his research difficult. However, after measuring the light and dark rings of the sample, taking the average of those rings, collecting the needed climate data, and graphing the material, it was evident that something affected the growth of the tree in 1961. Could it have been the Snell parking lot's being constructed in 1961 that influenced the growth of the White Ash? Considering the location of the specimen, the following assumptions were considered:

1) The runoff capabilities of the parking lot provided the tree with more water than it had received before.
2) The parking lot's ability to absorb heat 3-4 inches deeper into its material than the nearby soil made the climate several degrees warmer around the tree.
3) The constant heat being released from automobiles added a warming effect near the tree.

However, knowing that these factors would have continued to have an effect on the tree after 1961, one must ask why they did not continue to effect growth in subsequent years. Even though questions still linger, it is the belief of this researcher that the White Ash can tell at least some of the microenvironmental changes taking place around it.

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SUBLIMINAL MESSAGES

Joey Shuffett

Americans are fascinated by the power and potential of subliminal perception; yet they have little knowledge in this area and are often misled by it. The definition of subliminal is “below the threshold,” yet there is no fine line for this threshold. The scientific definition would be “that which could be detected fifty percent of the time;” however, even this is relative to such factors as the stimulus in the surrounding area and the state of the individual receiving the subliminal message. (Moore; 10)

What is the potential for subliminal messages? David Illich, a Seattle clinical psychologist, says, “If a person is motivated, subliminal persuasion can make suggestions to encourage a person so that permanent change occurs.” (Postman; 108) It is important to note here that a person must be motivated to follow the subliminal message; thus, a normally “sane” person could not be induced to commit a certain act against his own will.

One method of subliminal perception begins by increasing the person’s perceptivity by synchronizing the brainwaves to a Theta wave. When a person is undergoing normal conscious activities such as reading and writing, he is in the Beta wave. If that person were to relax even further he would enter the Alpha wave. The state of consciousness a person enters right before falling asleep is the Theta wave; there are no barriers to thought. (Postman; 110)

These messages are transmitted so subtly that they cannot be consciously deciphered. In audio subliminal messages, due to the narrow range of human hearing, the messages cannot be deciphered even though a small hissing noise can be heard. (Bower; 110) When words or pictures are used, they are flashed so quickly that a person could not possibly recall seeing them. (Morse; 28) Nevertheless, it is easy to tell that these messages have affected the person through the use of a galvanic skin response or from the measurement of an EEG. (Bower; 110) One of the primary ways of sending subliminal messages is by splicing a word or a picture into a video. The footage is then flashed on the screen faster than the eye can pick it up (about 1/30th of a second). Usually about sixteen to twenty different messages will be sent out during the video and will be flashed, one at a time, about every four seconds.

One psychologist has used subliminal techniques to change peoples’ attitudes toward geometric pictures. He achieved this by flashing a polygon on a screen for 1/100th of a second. When people compared these polygons to different polygons, they consistently chose those polygons that had been subliminally presented to them. (Zazow; 50)

One of the most curious discoveries concerning subliminal messages has been the success of the use of the statement, “Mommy and I are One.” If this statement—which is known as the process of subliminal psychodynamic activation—is utilized properly, it can be used to tap into powerful unconscious wishes which are shared by many adults. (Morse; 28) The statement “Mommy and I are One” can be applied to stimulate and provoke several types of improvements in a person’s behavior and possibly even to enhance the effects of psychotherapy. The use of this statement has been documented by a number of researchers for the last twenty years. In one study, 2,443 University of Southern California students showed modest behavioral improvements when exposed to this message subliminally. (Bower; 156)

Psychoanalysts explain that many adults are motivated by unconscious wishes for a state of oneness or fusion with another person. This rather Freudian theory implies that a desire for fusion or oneness begins in early childhood when the mother is experienced as comforting, protecting, and nurturing. One temporary solution to improving the behavior of a person who is suffering from this lack of fusion with another person would be to preserve that person’s sense of self. This procedure is often attempted as a method of psychoanalysis. (Bower; 156)

However, such subliminal messages must relate to the person receiving them in order for them to have any effect. For example, some people are more able to relate to entries which begin with “you,” while others relate better to those beginning with “I.” Also, a person’s subconscious has a greater response in terms of depth and quickness to a voice which is similar to his own. (Moore; 110) Another example comes back to the statement “Mommy and I are one,” which is not effective in the South because the word “momma” is more commonly used as a substitute for the word “mother.” (Adams; 157) Another fact that supports this theory is that women schizophrenics improved only after exposure to the words “Daddy and I are one.” (Adams; 28)

The creativity which is used in the application of subliminal messages seems endless. An example would be the use of phallic symbols as well as other titillating images in the magazine advertisements which are alleged to stimulate the viewers’ unconscious sex drives. As a matter of fact, almost any deliberate search for these symbols and images would more than likely prove successful. However, they are, under normal circumstances, too small or too vague to be consciously recognized. (Moore; 10)

One question offered by a number of psychologists today is: What are the effects of large doses of subliminal exposure? Consequently, these scientists are learning more about how to increase the amount of subliminal stimuli to an individual. For example, stimuli presented outside a small area located at the center of the subject’s visual field are not perceived as well as stimuli flashed in the central area.
It is important to remember that what is projected on a screen does not necessarily enter into a subject's visual cortex. (Bower; 157)

The current trend in subliminal perception is behavioral change. Yet according to Howard Sherrin of the University of Michigan, the crucial point is that subliminal techniques offer a way better to understand behavior, not to change behavior. Through the use of interviews and tests, it has been determined that certain words are emotionally significant to individuals seeking treatment for grief reactions or phobias. Also the subliminal presentation of an appropriate word or symbol to a subject supposedly results in a specific brain wave pattern. (Bower; 158)

A message that has an effect on schizophrenics is "Lion Destroys Man." This seemingly irrelevant statement has the effect of increasing the symptoms involved with schizophrenia. (Bower; 156) A number of other messages which have been "proved" to stir conflict, such as "Destroy Mother." (Adams, 28) Aggressive messages such as "People Arguing" have been shown to cause depressed young adults to become even more depressed. (Adams; 30)

An interesting aspect of subliminal perception is that it continuously correlates very strongly with Freudian ideology. To prove this, psychologists took the idea that anal conflicts sometimes play a vital role in stuttering and decided to test that theory with the use of subliminal messages. The psychologist did this by showing subliminal slides of dogs defecating to chronic stutters and as a result their stuttering grew increasingly worse. (Adams; 30)

Another example of the relationship between Freudian ideology and the subliminal perception was studied during a dart tournament. Placed on the dart boards used in this tournament were such subliminal messages as "Beating Dad is Wrong" and "Beating Dad is O.K." As expected, the results of the tournament showed that when the message "Beating Dad is O.K." was used, the scores were substantially higher than when the message "Beating Dad is Wrong" was used. When the psychologist used the term, "Mommy and I are One" in the dart tournament, the scores improved significantly. (Adams; 32)

In light of all this information and all these experiments, it is hard to believe that markets have not been flooded with subliminal merchandise. Although it is a growing field, the market for subliminal messages is still relatively small. One of the more interesting ways in which subliminal messages have been used, according to newspapers, is by inserting messages into music played in retail stores to get people to buy the merchandise, in essence sending out secret messages that attack the shopper's brain. (Buchwald; 22) Recently, a television commercial advertising childrens' toys contained the message "Get It" subliminally. The FCC banned its use. (Time; 71) The national television networks have now barred the use of subliminal techniques in advertising. (Zaison; 50)

Retail stores have also gotten into the act by playing subliminal messages to their customers by incorporating the message with bland music. These messages, which say something to the effect "I am honest, I will not steal" are usually repeated about nine thousand times per hour. There are about fifty department stores in the United States and Canada which have employed this method. This method was so successful in one store that in nine months its theft dropped 37%, saving a total of $600,000. (Time; 71) This same system has also been used in real estate offices to inspire personnel, as well as with professional athletes who are given subliminal pep talks. (Postman; 110)

Currently the fastest growing area in the subliminal/self-hypnosis field has been the use of audio tapes. These audio tapes address such topics as business success, emotional and physical health, and sex. They sell for about fifteen dollars but must be mixed with a decoder that costs over $150. (Harpers: 22) This decoder, or "black box" as it is also known, was created by Hal Becker, and is a sound mixer (like those used by D.J.'s) which layers bland music with subliminal messages appropriate to the problem. (Postman; 110)

The three tapes which have been the biggest sellers for the Metacom Company are "Lose Weight," "Stop Smoking," and "Relieve Stress and Anxiety." It is interesting to note that seventy percent of these tapes have been sold to women. (Postman; 110) Sales continue to increase. B. Dalton bookstores reports that approximately thirty to thirty-five percent of its spoken word audio sales fall into the subliminal persuasion/self-hypnosis category, and this success has been achieved with almost no advertising. Therefore the taboo on letting the public know that its subconscious can be stroked is long gone, thanks to the subliminal persuasion/self-hypnosis market. (Postman; 108)

Subliminal perception has progressed a long way from 1957 when a tub of buttery popcorn and a sweating cup of Coca Cola were projected during the previews of a movie theater. (Postman; 108) Even then the potential seemed outstanding, as popcorn sales supposedly increased by 57.5%, and Coke sales increased by 18%. (Morse; 18) Experiments such as flashing the word "blood" subliminally during a 1950's picture, or showing images of a death mask during the movie "The Exorcist" were intended to increase the amount of tension in viewers. (Time; 71) Yet the main question that arises is: How do we know that these findings are valid? For instance, how do we know that Coke sales did not increase in 1957 because it was a very hot summer night? Very few of these tests have been scientifically validated; and as a matter of fact, some tests, such as the Iowa State University test of the subliminal impact on weight loss, are believed to have failed altogether. (Postman; 114)

Recognizing that there has been no scientific documentation proving that subliminal messages can effectively change behavior (Moore; 10), and that many researchers have not been able to replicate many of the findings that have been claimed by others (Adams; 34), it is important that we not get carried away with the potential of subliminal messages. It is important, however, that we not abandon the
research into subliminal messages. The best avenue that could be taken would be to continue to study and test the potential and effects of subliminal messages for the greater use of our society.

BIBLIOGRAPHY


When someone mentions the word “comic book,” visions of Superheroes and Supervillains come to mind. Most people think that they are just for kids. Some believe that they corrupt the young, while others say they develop a love for reading and a growing appreciation of literature in our younger generation.

The comic book as we know it today originated in the newspaper comic strip; and the comic strip began in the United States late in the nineteenth century. American cartoonists combined several separate elements that had been present in the European cultures for centuries: drawings in sequence that told a story, “balloons” filled with words, and caricature. Beginning in the 1890’s, comic strips began to run in American newspapers. After a few years, daily comic strips and Sunday comic sections in color became features of most American newspapers. Some of these newspaper comics offered extended narratives that were told over several days and in several drawings. Experiments with the design of the Sunday comics, involving the shape and arrangement of panels, began to take place. The comic strip took a long time to assume a definite format, and so did the comic book. Over a period of about three decades, publishers experimented with many kinds of formats. They first reprinted newspaper strips in book form, with both hard and soft covers.

In 1929, one publisher tried to create a weekly publication called The Funnies, made up entirely of new comics. It was not successful, perhaps because it was tabloid size and thus resembled the Sunday comics section. In 1933 comic books of approximately the modern size and shape were published by Eastern Color Printing Company—but as premiums, to be given away by retailers and manufacturers to their customers. No one considered selling these comic books directly to the reader until M.C. Gaines, a salesman at Eastern Color, tested the market by putting a ten-cent price on a few copies and leaving them at two news stands. This proved successful, and after a few false starts, Famous Funnies No. 1 was published monthly and was sold on the news stands for a dime. It was the first true comic book in the modern sense; but like many of the comic books that preceded it, it was composed of reprinted newspaper strips. The first comic book made up entirely of new material did not appear until early 1935; this was News Fun No. 1. This type of comic would eventually set the standard.

The modern version of the comic book may have begun in 1935, but some consider the real turning point in the comic book’s history to have been in the summer of 1932. Jerry Siegel and Joe Shuster, students of Glenville High School in Cleveland, had become friends through their shared interest of comic strips, especially heroic fantasies like Tarzan and Buck Rogers. They began to create comics of their own; Siegel would write and Shuster would illustrate. One of their ideas for a comic strip was a man that possessed super-human abilities. They created the script and drawings for twelve installments of a daily newspaper strip—two weeks worth—but they were rejected by the established newspaper syndicates. When their strip, Superman, finally found a home, in 1938, it was the first issue of a monthly comic book, Action Comics. Within a short time, Action Comics—with Superman in each issue—was selling almost a million copies each month; the bi-monthly Superman comic book was selling well over a million copies per issue, and the character had spread from comic books to radio and the movies (1, 10).

By 1941, he had spread to the newspapers and was running as a daily strip signed by Siegel and Shuster in 230 papers. The success of Superman alerted publishers to the profits to be gained from offering readers a larger-than-life super-hero; and within a few years the news stands were filled with comic books starring such characters. Some of the new heroes possessed powers similar to Superman, but many were more unique. The costume vigilante, exemplified by Batman, became a popular super-hero. Other examples were the Phantom, the Lone Ranger, and the Green Hornet. Batman became the second-most popular super-hero; his bi-monthly comic book was selling 800,000 copies per issue by 1941. If in the mid-1930’s just one of the syndicated newspapers had accepted the Superman comic strip and given it a chance, the history of comic books would surely have been different. If Superman had entered the pages of the newspaper comics before 1938, the strip probably would have been reprinted in a comic book. However, the reprinted Superman could not have changed comic books in the same way the Action Comics and Superman bi-monthly did (1, 11).

Beginning in the early 1940’s other kinds of comics, from many different publishers, found favor with millions of readers. The Walt Disney characters, Mickey Mouse and Donald Duck, began appearing monthly in Walt Disney’s Comics and Stories in the fall of 1940, and other comic books with animated-cartoon characters soon followed. The next step in the advance of the comic book spawned a multitude of imitators. Another type of comic to emerge was the western; and that staple of America made the transition to comic books with ease. Cowboy movie stars like Roy Rogers and Gene Autry became comic book stars as well (1, 11). Romance comic books became popular in the postwar years, having the same appeal as radio soap operas and confession magazines. The crime comic book ultimately had the greatest impact on the comic book industry. Crime
had always been present in the super-hero comic book—the heroes usually proved themselves to be heroes by defeating the criminals—but the emphasis of the new crime comic books was on the crimes themselves. The first of this type was Crime Does Not Pay, published in 1942, and was followed by a wave of imitators until the postwar years. The success of these frequently violent and shocking crime comic books led one publisher, E.C., to go one step further, and in 1950 introduced three horror titles—The Crypt of Terror, The Vault of Horror, and The Haunt of Fear. Comic books were soon filled up with bloody axes, severed heads, and rotting corpses (1,12).

During the 1950s, these shocking tales came under the scrutiny of Senator Estes Kefauver’s crime investigations and attacks from psychiatrists such as Frederic Wertham (5,93). A book by Wertham, The Seduction of the Innocent, stirred tremendous concern. He argued that the graphic nature of comic books, especially the horror comic book, had a damaging effect on the minds of children (2,34). Comic books had been criticized in print since 1940 because of the feared affect on the majority of its readers, the children. Wertham saw in the creators and publishers of comic books “veritable vampires who sucked the blood of the innocent” (3,132). Another famous and influential critic of comic books was Gershom Legman. His theory, expounded in his book, Love and Death (1949), was that the violence in comics and pulp literature was the transformation of and compensation for sexuality repressed and restricted by society. Legman’s ideas were a lot closer to answering basic questions than Wertham’s or any of his followers’ theories. However, Legman overshot his goal at times, claiming for example that the creators of comic books were homosexual degenerates that belonged in jail. Wertham was particularly concerned about the sexual stimulation of comic books. He maintained that the comic book super-heroes were clearly homosexual (3,132). It is true that comic books were fairly daring. Sonya Belle has said, “Very likely the young reader found the sight of buxom girls, cruelly tied up and clothed in tatters, facing a fate worse than death, stimulating in those days” (2,208).

In an attempt to ward off criticism and impending censorship, the Comics Code Authority was established, setting standards for the content of comic books (5,93). The Comics Code Authority functions under the direction of an administrator, who has no other connection with the industry, and who is empowered to exercise independent judgement in interpreting and enforcing the association’s Code. The Code covers both the editorial content—that is the entire text and artwork—and the advertisements, in a comics magazine (4,23). The adoption of the Comics Code in October 1954 marked the end of sixteen years of flamboyant success for the comic book industry (1,12). Every member of the Comics Magazine Association of America pledges to adhere to its terms, but more than that—to submit all material intended for publication to the Authority for advance review and judgement. This is to insure Code compliance (4,23). The Code consists of 41 specific regulations, governing material which leading members of the industry, and many public figures and organizations concerned with the matter, have found through experience to be in the “problem area” when used in comic books. These provisions make up the most severe set of principles for any communications media in use today. Any material which does not meet with the Code’s approval must either be corrected or eliminated (4,24).

“Excerpts from Code of the Comics Magazine Association of America: Criminals shall not be presented in glamorous circumstances, unless an unhappy end results from their illgotten gains, and creates no desire for emulation... In every instance good shall triumph over evil and the criminal be punished for his misdeeds... Policemen, judges, government officials and respected institutions shall not be presented in such a way as to create disrespect for established authority... No unique or unusual methods of concealing weapons shall be shown, except where such concealment could not reasonably be duplicated... Although slang and colloquialisms are acceptable, excessive use should be discouraged and wherever possible good grammar shall be employed... Nudity in any form is prohibited. Suggestive and salacious illustration is unacceptable... Divorce shall not be treated humorously nor represented as desirable... All situations dealing with the family unit should have as their ultimate goal the protection of the children and family life. In no way shall the breaking of the moral code be depicted as rewarding... All elements or techniques not specifically mentioned herein, but which are contrary to the spirit and intent of the Code, and are considered violations of good taste or decency, shall be prohibited” (2,34).

Although the Code probably saved the industry, it made for rather mild reading at a time when television and movies were becoming bolder in their themes and treatments (5,93). Many publishers left the business in the 1950s, and total circulation fell (1,12).

In the 1960s, Stan Lee and the Marvel Comics group breathed new life in the comic book style by introducing the “super-hero with a problem,” characters such as Spiderman, the Hulk, and the Silver Surfer. These figures had a basic communication problem: they were trying to serve humanity with their powers, but their good intentions were almost always misunderstood by society. This theme seems appealing to many adolescents and adults in today’s complex, bureaucratic society” (5,93). The super-heroes were becoming humanized and began facing the complications of everyday life. In the long run, humanity in itself is not enough to fascinate the reader, but even the small problems of private life have social references. Social evils, treated realistically, began gradually to appear in comic books
incidentally and almost unnoticed. When Peter (Spider-man) Parker and Dick (Robin) Grayson entered college they suddenly found themselves in the thick of the protest against social evils and were involved in riots, sit-ins, demonstrations and protest meetings. This opened the door to revolutionary ideas in comic books (3,240). Social problems became part of appropriate story lines. Sexism, racism, and pollution were topical events in many of the comic books.

One character, Iron Man, is a reformed alcoholic; he is currently in a period of sobriety, but his struggle has been depicted. The drug problem, which became an issue in the early 1970s, began to appear in some of Marvel Comics’ plots (7,42). In May of 1971, The Amazing Spider-man assumed an anti-drug attitude. In order to do this it had to do without the approval of the Comics Code. The episode with the drug situation ended after three issues, and The Amazing Spider-man regained the Code seal. Finally on April 15, 1971, the Supervisory Council of the Comics Magazine Association of America unanimously resolved to adopt a standard attitude, with the introduction: “Narcotic addiction shall not be presented except as a vicious habit.”

The Comics Code was in the process of becoming more lenient (3,246).

Comic books, having reached their height of popularity over thirty years ago, are making a comeback. The current industry is nowhere nearly as large as it was in the late 1940s and early 1950s, when sales approached one billion units a year, but things are looking up (2,34). One sign of the comic book’s returning respectability is its appearance in bookstores. Both Waldenbooks and B. Dalton have made a commitment to merchandise comic books (2,34). After harsh criticism and a self-induced censorship program took its toll on the industry, the comic book is earning favor with both child and adult alike. In an age of increasing concern about illiteracy, questions have been raised about the value of comics: Do they hamper a child’s capacity to read “real books,” or do they foster an appreciation of reading?

Waldenbooks’ magazine buyer Kent Rollison comments: “I think the primary objective is to teach the children the enjoyment of reading. If in some cases comic books accomplish this, then I think it’s fine.” At least the children are reading something (2,36).

Marvel Comics has developed the Star Comics line, a publishing program designed for early readers. This comic book line was designed to offer the young reader an alternative to the increasingly complex plots and more difficult literary devices that have been introduced recently. These are simple in appearance and contain easy dialogue and vocabulary (7,38).

What is the value of the comic book in our society? The idea of the comic book has changed through the years from a cheap form of entertainment to a corrupting force against our youth to a weapon to combat illiteracy. The value of the comic book has not been and may never be clearly or completely defined, but for the time being the comic book has been accepted and is even being praised.

WORKS CITED

A COMPARISON OF MULTIPLE REGRESSION AND QUADRATIC TREND FORECASTING MODELS FOR WKU ENROLLMENT

Judy Renfrow

In order to forecast enrollment at Western Kentucky University, time-series data is collected for the enrollment variable. This data is the fall head count for each year over a twenty-eight year period from 1959 to 1986. This data can be found in the Western Kentucky University Archives.

Exogenous and endogenous factors affect the behavior of the enrollment variable. Enrollment is affected by exogenous factors such as:

1. The open admissions policy that Kentucky committed to in 1955;
2. The 1970 admission of the University of Louisville into the state educational system;
3. The 1980 state budget cuts in educational funding;
4. The entry of the Bowling Green Business College into the educational system;
5. The rapid advances made in space and technology in the 1960's;

Enrollment is also affected by endogenous factors such as the selective admissions policy that Western Kentucky University began in 1983.

Since the enrollment variable is measured using the fall head counts of each year, this data does not need to be adjusted seasonally. That is, the fall head count for one year is just a single observation; thus, no seasonality occurs in this data.

The sample which was obtained for this project should be an appropriate representation of the population since it covers a twenty-eight year time period. In this project, two forecasting models, a multiple regression and quadratic trend model, are used. These two models will be compared to determine which model produces the better forecast.

The quadratic trend forecasting model is:

\[ \text{ENROLL} = \text{BO} + \text{B1(T)} + \text{B2(T^2)} \]

where

\[ \text{ENROLL} = \text{the fall head count at WKU} \]
\[ T = 1 \text{ for 1951, 2 for 1960, etc.} \]
\[ T^2 = T^2 \]

The estimated equation is:

\[ \text{ENROLL} = 1371.72 + 1144.18(T) - 27.75(T^2) \]

In order to evaluate this model statistically, the summary statistics generated by the computer program are examined. The coefficient of determination is equal to 0.98; thus, the quadratic trend model explains 98 percent of the variation in enrollment. In order to analyze the joint effect of both of the independent variables on the enrollment variable, an overall F-test is performed. Given two and twenty-five degrees of freedom, the critical-F at the 0.05 level is 3.38. The F-statistic of the model is 708.91. Since the F-statistic is greater than the critical-F, it can be concluded that the model does explain at least a portion of the variation in the dependent variable.

The accuracy measures generated by the computer program are the MAD, MSE, and MAPE. According to the MAPE, the model has an average error of 4.08 percent. According to the MAD, the model is in error by 366 enrolled students. The MSE of the model is 178600.

When using the quadratic trend model, forecasted enrollments will first increase with time, reach a peak at some point in time, and then decline with time. This can be shown by taking the first derivative of the equation. The first derivative is \( \text{ENROLL} = 1144.18 - 55.5(T) \). By setting the first derivative equal to zero and solving for \( T \), one finds that the peak enrollment at WKU was in the time period 21 (the year 1979). So, according to the quadratic trend model, enrollment at WKU will continually decline after 1979. Since it does not seem likely that enrollment will never increase again at WKU, a different trend model should be used or adjustments should be made in the forecasted enrollments of the quadratic trend model to produce accurate ex ante forecasts for enrollments.

The 1987 enrollment forecasted by the quadratic trend model is obtained as follows:

\[ \text{ENROLL} = 1371.72 + 1144.18(T) - 27.75(T^2) \]
\[ = 1371.72 + 1144.18(29) - 27.75(841) \]
\[ = 11215.19 \]

Thus, forecasted enrollment for 1987 is 11215 students.

The multiple regression forecasting model used to forecast enrollments at WKU is of the form:

\[ \text{ENROLL} = (\text{TUITION, FINANCIAL AID}) \]

Tuition belongs in the model because it is a cost of enrolling in college. The expected sign of the coefficient of the tuition variable would be negative because one would expect that as tuition (in real dollars) increases, enrollment would decrease. Financial aid also belongs in the model because it is a way of paying to enroll in college. The expected sign of the coefficient of the financial aid variable would be positive because one would expect that as the amount of financial aid (in real dollars) increases, enrollment would increase.

Time-series data is gathered for the independent variables, tuition and financial aid, over a twenty-eight year period from 1959 to 1986. The independent variables are affected by exogenous factors such as:

1. The 1970 admission of the University of Louisville into the state educational system;
2. The 1980 state budget cuts in educational funding.
Since the tuition variable is measured using the fall tuition of each year and the financial aid variable is measured using the amount WKU received for each year, this data does not need to be seasonally adjusted. That is, the value of each independent variable for one year is just a single observation; thus, no seasonality occurs in this data.

The amount of tuition per semester that students have paid each year from 1959 to 1986 can be found in the *College Heights Bulletins*, volume 30 no. 3 to volume 60 no. 1, which are located in the Western Kentucky University Archives. In order to account for inflation, the time-series data for in-state and out-of-state tuition is deflated using the CPI (1967 = 100). In order to have one independent variable to represent tuition, the overall year-to-year percentage change in tuition (OPCT) is calculated by taking the average of the year-to-year percentage change in in-state tuition expressed in 1967 dollars and the year-to-year percentage change in out-of-state tuition expressed in 1967 dollars.

The amount of financial aid that Western Kentucky University has received to award to students can be found in the Western Kentucky University Archives in the "Statement of Federal Program Participation 1958-1986." The total financial aid for each year consists of: National Direct Student Loan, College Work-Study Program, Supplemental Educational Opportunity Grant, Nursing Loan, Nursing Scholarship, Law Enforcement Education Program, Basic Educational Opportunity Grant, and State Student Incentive Grant. In order to account for inflation, the financial aid variable is deflated using the CPI (1967 = 100). The CPI (1967 = 100) for 1959 to 1986 is obtained from the *1987 Statistical Abstract of the United States*.

The multiple regression forecasting model used to forecast WKU enrollments is as follows:

\[ \text{ENROLL} = B_0 - B_1(\text{OPCT}) + B_2(\text{RAID}) \]

where

- ENROLL = the fall head count at WKU
- OPCT = the overall year-to-year percentage change in tuition
- RAID = the amount of financial aid, expressed in 1967 dollars, that WKU has received to award to students

The estimated equation is:

\[ \text{ENROLL} = 5093.60 + 3.52(\text{OPCT}) + 0.004(\text{RAID}) \]

The estimated regression equation verifies the assumption that a positive relationship exists between enrollment and the amount of financial aid available; however, it contradicts the assumption that a negative relationship exists between enrollment and tuition.

According to the coefficient estimated for the OPCT variable, enrollment increases by 3.52 students for each percentage-point increase in OPCT, *ceteris paribus*. This result does not seem reasonable because one does not expect more students to enroll in college when tuition increases. A possible explanation of this unreasonable result is that the model may be misspecified. One could respecify the model by using a different functional form such as the log-linear form, or one could respecify the model by including additional explanatory variables such as a variable for recruitment expenditures by WKU and a variable for the number of high school seniors who plan to go to college.

According to the coefficient estimated for the RAID variable, enrollment increases by 0.004 students for each dollar increase in real financial aid available, *ceteris paribus*; for each $250 increase in real financial aid available, enrollment will increase by one student, *ceteris paribus*. This result seems reasonable because one would expect enrollment to increase when the amount of real financial aid available increases.

In order to evaluate this model statistically, the summary statistics generated by the computer program are examined. The coefficient of determination is equal to 0.898; thus, the multiple regression model explains 89.8 percent of the variation in the enrollment variable. In order to analyze the joint effect of both of the independent variables on the enrollment variable, an overall F-test is performed. Given two and twenty-five degrees of freedom, the critical-F at the 0.05 level is 3.38. The F-statistic of the model is 109.50. Since the F-statistic is greater than the critical-F, it can be concluded that at least one Bi in the model is not equal to zero.

In order to determine whether the assumptions regarding the coefficients of the independent variables are correct, hypothesis testing is performed for each of the coefficients.

For B1, the coefficient of OPCT, the null hypothesis is that B1 equals zero, implying that there is no relationship between ENROLL, the dependent variable, and OPCT, the independent variable. The alternative hypothesis is that B1 is less than zero, implying that there is a negative relationship between OPCT and ENROLL. Since the estimated coefficient for B1 is greater than zero (B1 = 3.52), the null hypothesis is automatically accepted. Thus, the OPCT variable does not have any effect on the ENROLL variable.

For B2, the coefficient of RAID, the null hypothesis is that B2 equals zero, implying that there is no relationship between ENROLL, the dependent variable, and RAID, the independent variable. The alternative hypothesis is that B2 is greater than zero, implying there is a positive relationship between RAID and ENROLL. Since the sign of the estimated coefficient for B2 agrees with the alternative hypothesis, the 1-tail p-value is used to determine the statistical significance of the RAID variable. The computer program generated a 2-tail p-value of 0.0001 for B2; so, 0.5(2-tail p-value) is used for the 1-tail p-value (1-tail p-value = 0.00005). Since the 1-tail p-value is less than 0.05, the significance level being used, the null hypothesis is rejected. Therefore, changes in RAID do cause changes in ENROLL.

One of the basic assumptions of the multiple regression model is that the independent variables must be linearly independent of each other. If this assumption is violated, multicollinearity is said to exist. The presence of multicollinearity results in an overstatement of the standard errors of the regression coefficients which causes the t-ratios to be smaller. Thus, the presence of multicollinearity lowers
the reliability of the model. In order to detect the presence of multicollinearity in the model, the correlation coefficient matrix is examined. Since the correlation between OPCT and RAID is -0.298, which is less than 0.5 in absolute value, multicollinearity does not exist.

Another basic assumption of the multiple regression model is that the error terms are randomly distributed. If this assumption is violated, autocorrelation is said to exist. The presence of autocorrelation results in an underestimation of the standard errors of the regression coefficients which causes the t-ratios to be larger. Thus, the presence of multicollinearity in the model, the correlation coefficient matrix is examined. Since the correlation between enrollment and RAID, the model is inadequate for forecasting future values of RAID. However, according to the statistics generated for the linear trend model for OPCT, the model does not forecast values for OPCT accurately; thus, a problem exists in forecasting future values for OPCT.

Using the linear trend models estimated to forecast OPCT and RAID, the 1987 enrollment forecasted by the multiple regression model is obtained as follows:

\[
\text{OPCT} = 9.77 - 0.29(T) \quad \text{RAID} = 34739.19 + 82414.97(T)
\]

Thus, forecasted enrollment for 1987 is 14796 students.

In comparing the two models, it can be shown that the quadratic trend model produces the best ex post forecast. First, the forecast errors as measured by the MAD, MSE, and MAPE are examined. These error measurements are summarized as follows:

<table>
<thead>
<tr>
<th>Trend Model</th>
<th>MAD</th>
<th>MSE</th>
<th>MAPE</th>
<th>APE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>366</td>
<td>178600</td>
<td>4.08</td>
<td>9.49</td>
</tr>
</tbody>
</table>

An evaluation of these error measurements indicates that the trend model performs better than the quadratic model. Both models correctly forecast the peak in enrollment in 1979, and both models miss the turning point for the trough in enrollment in 1985. Of the turning points predicted, 0% of the turning points in the trend model are false signals, while 70% of the turning points in the multiple regression model are false signals. However, the multiple regression model only misses 25% of the turning points, whereas the trend model misses 75% of the turning points. After comparing the two models, it can be concluded that the quadratic trend model performs better than the multiple regression model in making ex post forecasts.

The ex ante forecast for enrollment for 1987 is 11215 students according to the quadratic trend model. According to the multiple regression model, the ex ante forecast for 1987 is 14796 students. Thus, the quadratic trend model's forecast indicates that enrollment will decline by 1042 students between 1986 and 1987, whereas the multiple regression model's forecast indicates that enrollment will increase by 2539 students between 1986 and 1987.

Although the quadratic trend model performs better than the multiple regression model in making ex post forecasts, the reliability of its ex ante forecasts is questionable because according to it, enrollment will now decline year-after-year regardless of the existence of any exogenous or endogenous...
factors or of any structural changes. Future forecasts of enrollment may also be affected by structural changes such as the increased use of robots and computerized operations in manufacturing environments which would require retraining of employees.

According to the quadratic trend model, the 1988 forecast for enrollment is obtained as follows:

\[
\text{ENROLL} = 1371.72 + 1144.18(T) - 27.75(T^2)
\]

\[
= 1371.72 + 1144.18(30) - 27.75(900)
\]

\[
= 1371.72 + 34325.40 - 24975.00
\]

\[
= 10722.12
\]

Thus, forecasted enrollment for 1988 is 10722 students.

Since the multiple regression model does perform better in predicting turning points, this model could possibly produce more reliable ex post and ex ante forecasts if the previously mentioned improvements and modifications are made to the model.

Meanwhile, a combination of the forecasts from the two models might produce a more reasonable forecast. Thus, the two forecasts are combined using a weighted average where the weight of the regression model's forecast is two and the weight of the trend model's forecast is one. For 1986 and 1987, the combined values, using this weighted average, are 12650 and 13602 respectively, which are very close to the actual values, 12257 and 13520, respectively.
REGRESSION ANALYSIS AT WKU FALL ENROLLMENTS

Melissa Simpson

This project is a multiple regression analysis on fall enrollment at Western Kentucky University from 1959 to 1985 (ENROLL). Three independent variables: evening and weekend courses (EW), recruitment efforts (RE), and the total number of students nationwide within the ages of 18 to 24 (ENRL) are felt to have an influence on fall enrollment. The following function is presented:

\[
\text{ENROLL} = f(\text{EW}, \text{RE}, \text{ENRL})
\]

and the prediction equation is written as:

\[
\text{ENROLL} = K1 + K2(\text{EW}) + K3(\text{RE}) + K4(\text{ENRL})
\]

where:

- **K**: Specified constant
- **ENROLL**: Fall enrollment at Western Kentucky University, the dependent variable for the model.
- **EW**: Evening and weekend courses offered by Western Kentucky University during fall semesters from 1959 to 1985. The University has progressively increased the number of evening and weekend courses offered making educational facilities available for students who would otherwise be unable to attend. An increase in the number of evening and weekend courses offered is expected to result in an increase in fall enrollment.
- **RE**: Recruitment efforts at Western Kentucky University. Recruitment efforts initiated by the University have become more widespread in recent years. Expanded recruitment efforts attract a wider range of students to the University, resulting in increased fall enrollment.
- **ENRL**: Total number of 18 to 24 year old students enrolled in educational facilities nationwide. Demographic predictions from the United States Census Bureau indicate there will be a steady decline in the total number of persons in this age group from 1980 to 1995. College enrollment on the whole should decline in view of the fact that the "traditional" student falls within this age group. A decrease in the enrollment of 18 to 24 year old students is expected to have a direct effect on fall enrollment at Western Kentucky University.

Data used in the model consists of observations within a time series ranging from 1959 to 1985. (See Table I.) The actual number of evening and weekend courses offered each fall semester at Western Kentucky University is the ideal data for the first variable (EW). Factual figures are not readily available; consequently, classes are counted manually from fall schedule bulletins. The accuracy of such data is questionable; computation errors can occur, and schedule bulletins often do not reflect final class offerings.

Recruitment efforts (RE) at Western Kentucky University are difficult to isolate. Total budget figures for a distinct recruitment division are preferred but cannot be obtained. Since recruitment efforts require extensive travel, expenditures for travel for each of the three University departments responsible for recruitment during the period are used as representative data. It is important to note that inconsistencies in the budgets do exist. "Approved" or "Estimated" budget figures found in years 1959 through 1963 tend to over-value actual expenditures on travel.

Several government documents are researched to obtain data for the third and final variable. Consistent data for the period is not found in publications from the United States Department of Education or the Center for Educational Statistics. Enrollment figures are therefore taken from the *Statistical Abstracts of the United States,* "Persons 5 to 34 Years Old, School Enrollment, by Age and Sex" tables in years 1959 through 1985. (Data for 1986 is not available and has been eliminated from the period under study for all variables.) Data derived from such a general sample is a rough proxy for the traditional student group.

Regression analysis should be used cautiously. There are certain econometric problems that may be encountered, one of which is multicollinearity. Multicollinearity exists when two or more of the independent variables within a model are correlated. If independent variables are highly correlated their individual effect on the dependent variable cannot be determined accurately. Standard errors of the coefficients tend to increase, resulting in acceptance of Ho when it should not be accepted.

Correlation coefficients for the independent variables in the model exceed .5, strongly suggesting the presence of multicollinearity. (see Table II.) To substantiate the findings regression outputs are run substituting each of the three independent variables for the dependent variable in the equation. An F-test on each separate output indicates if an independent variable is effected by at least one of the remaining independent variables. Results verify suspicions that a high degree of multicollinearity does exist among the three independent variables.

Various methods exist to handle problems of multicollinearity. In certain situations it is possible to redefine the independent variables and use alternative measurements for the data. Alternative measurements for independent variables in the present model would be difficult to obtain. If a sampling property seems to be the cause
of multicollinearity in the model, an increase in the number of observations for the sample will often remedy the problem. Elimination of an independent variable in the model should also decrease the probability of multicollinearity. The omission of a variable, however, will result in biased and unreliable results for the other variables and should only be used as a last resort. If multicollinearity cannot be avoided by simple alterations of the data, there may be no alternative but to develop new variables and acquire new data.

Another econometric problem to arise in regression analysis is serial correlation. When regressions are based on time-series data, successive values of the error terms may not be independent. Consequently, the model will often appear more credible than it should. To test for serial correlation, the Durbin-Watson test is used. Using a one-tail test at a .05 level of significance, where \( n = 27 \) and \( k = 3 \), values taken from the Durbin-Watson table are: \( D(L) = 1.16 \) and \( D(U) = 1.65 \). Compared with a Durbin-Watson value of \( d = 0.69465906 \) from the output, there is statistically significant evidence of positive serial correlation in the model.

The final model derived from the output is as follows:

\[
\text{ENROLL} = -723.08 + 8.6(\text{EW}) - 0.19(\text{RE}) + .0016(\text{ENRL})
\]

Holding all other variables constant, an increase in the number of evening and weekend courses offered at Western Kentucky University by one unit will result in an increase in fall enrollment by 8.6 units. A one unit increase in University recruitment efforts will result in a decrease in fall enrollment by 0.19 units. An increase in the total number of students within ages 18 through 24 by one unit will lead to an increase in fall enrollment by .0016 units.

Upon evaluation of the value of coefficient of determination, or R-square, for the model (R-square = .946860) it appears that 94.68% of the variation in fall enrollment is explained by the model.

An overall F-test is performed to determine if fall enrollment at Western Kentucky University is effected by at least one of the independent variables. Using an F distribution for an upper-tail test with 3 to 23 degrees of freedom, testing at a significance level of .05, the critical value is 3.03. The F-value for the model is 136.61 which exceeds the value from the table. The hypothesis that at least one of the independent variables in the model has an effect on fall enrollment is accepted.

Next, a hypothesis test is performed on each of the independent variables. The null hypothesis, \( H_0 \), asserts that the independent variable has no, or an unexpected, effect on fall enrollment at Western Kentucky University. The alternative hypothesis, \( H_1 \), states the variable has a positive effect on fall enrollment. The following hypotheses have been set up for each variable:

- \( H_0: b < 0 \)  
- \( H_1: b > 0 \)  

\( E: b < 0 \quad \text{RE: } b < 0 \quad \text{ENRL: } b \leq 0 \)

\( H_1: b > 0 \)  

\( H_1: b > 0 \)  

\( H_1: b > 0 \)

P-values test the probability of obtaining a test statistic more extreme that the actual result, given the null hypothesis is true. Upper-tail p-tests are performed for each independent variable.

Upon examination of the sign of the coefficients it is apparent that the coefficient for \( RE \) does not agree with \( H_1 \). \( H_0 \) must therefore be accepted; University recruitment efforts have no effect on fall enrollment at Western Kentucky University.

Coefficients for \( EW \) and \( ENRL \) agree with \( H_0 \) and must be further tested. A decision is made to accept or reject \( H_0 \) based on the following calculations:

\( EW: \text{one-tail p-value} = .5 (.0068) = .0034 \quad .05 \)

\( ENRL: \text{one-tail p-value} = .5 (.0001) = .00005 \quad .05 \)

There is a .34% and .005% chance, respectively, of obtaining coefficients more extreme than the coefficients obtained from the given sample if \( H_0 \) is true. Since the values obtained for the two variables are extremely small, \( H_0 \) receives little support from the data and must be rejected.

The original hypotheses that fall enrollment at Western Kentucky University is directly influenced by the number of evening and weekend courses offered by the University and by the total number of students within the ages of 18 to 24 nationwide, are accepted. Recruitment efforts for the University, however, do not have a direct effect on fall enrollment, contrary to what is believed to hold true. Results for this variable appear unreasonable and should be further tested for validity.

A primary function of regression analysis is to aid in the forecasting of future events. The forecasting ability of this model is questionable. The presence of econometric problems such as multicollinearity and serial correlation suggest a violation of basic assumptions which must first be met in order to improve accuracy of forecasts.

A relatively high R-square value indicates the model has successfully explained, to a great extent, variation in fall enrollment. Results of the hypothesis test seem reasonable with the exception of the output for University recruitment efforts. The hypothesis that recruitment efforts have no effect on fall enrollment at the University is accepted; nevertheless, further research is necessary before accuracy of the hypothesis can be determined.

In general, data for the independent variables is inconsistent and unrepresentative. Reliable and applicable data concerning Western Kentucky University is difficult to gather due to inconsistent record-keeping techniques over the years. Successive studies should involve the development of new independent variables; variables which are not interrelated and for which accurate and representative data can be found.

(see tables on following page)
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### TABLE II

**CORRELATION COEFFICIENT MATRIX**

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In 1986 Toyota Motor Company announced plans to build an automobile assembly plant in Georgetown, Kentucky. Approximately one year later Ambrae Corporation released blueprints for a new industry to be constructed in Elizabethtown. Suddenly Elizabethtown and Hardin County found a global, pluralistic society advancing upon their community. Educators in these two school districts were asked to respond positively to the many and varied needs of these new students from different national and cultural backgrounds. Once again a new challenge faced Kentucky education! Teachers in Kentucky, specifically Elizabethtown and Hardin County, needed to respond with vigor if education was to be the linkage between "Traditional Cultures of the past and the global culture of the future . . ." (Hoopes, p. 30). Now more than ever before "we live in a time when the need for understanding and mutual respect across cultural boundaries is imperative" (Gasto, p. 1).

Communication on many levels becomes an urgent, important necessity in the process of building pluralism into the educational systems of Elizabethtown and Hardin County. "Implicit in the achievement of understanding and respect is the successful interchange between two human beings that we call communication. Language is of course a key component of communication; and although the accurate use of linguistic form is necessary for effective communication, in most communicative situations the communicators do more than simply talk to each other in grammatically well-constructed sentences. There must also be a familiarity with the culture of the language being used by the communicators" (Gaston, p. 1). While most educators will concur with the above statement, the majority of regular classroom teachers have had nothing in their prior training to prepare them to instruct children who have very little knowledge of the English language. Consequently, "Limited English Speaking (LEP) Students present a challenge to teachers which require every learned, intuitive, and creative teaching technique possible" (Sakash, p. 4). The American Association of Colleges of Teacher Education (AECT) has defined cultural pluralism as follows: "To endorse cultural pluralism is to endorse the principle that there is no one model American. To endorse cultural pluralism is to understand and appreciate the differences that exist among the nation's citizens. It is to see differences as a positive force in the continuing development of a society which professes a wholesome respect for the intrinsic worth of every individual . . . It is a concept that aims toward a heightened sense of being and of wholeness of the entire society based on the unique strengths of each of its parts" (Ornstein and Levine, p. 446).

What implications does this have for the Kentucky classroom teacher? Joyce Penfield (1987) says, "Despite the increase in the number of trained ESL specialists over the past ten years or so, it is no secret that vast numbers of limited English proficient (LEP) students will spend either all or large portions of their academic life with regular or content classroom teachers" (p. 21). So the responsibility for educating children who are linguistically, racially, and culturally different has become a fact of life for many classroom educators. The Japanese children bring to Kentucky, Hardin County, and Elizabethtown a rich background of different value systems, different social customs, different religious beliefs, different historical heritage, and different language skills. To most teachers, and also to the new pupils, these differences can be overwhelming. The essential task of maximizing multicultural education and reducing ethnocentrism must become the challenge and the objective of each classroom teacher.

One of the most important elements in multicultural education is the teacher's attitude. Teachers need to function as models. "Where the teacher thinks globally and has a sense of being a part of an independent world, intercultural education will often occur in the classroom—sometimes without the students and the teacher realizing it—not only in social studies and language classrooms but in math, science, and literature classrooms as well" (Hoopes, p. 29).

To understand the international students' situation, teachers who instruct them must value cultural diversity and be sensitive to culture difference. Teachers must also be able to recognize cultural barriers to effective communication. While noting these differences, it is just as important for the instructor "... to teach children to find underlying similarities as well as obvious differences among peoples" (Martin, p. 7). And, finally, to ensure that multicultural education is not just a subject, but rather a fact of life in every classroom, teachers need to decide "... how it is they want their students to behave toward one another and what attitudes they want to foster in their classrooms" (Ziegler, p. 13).

It is essential that the teacher understand the position of the learner. "Learning to speak English is a major task, but its difficulty is compounded by a new environment, a new value system, a change in educational methods and techniques of instructions, and when expected behaviors are new and must be learned" (Sakash, p. 4). While there is no single way to ensure cultural awareness, there are some instructional methods that many people believe are best suited to the intercultural learning process. "Among them are experimental learning, the inductive or inquiry method, and the direct approach" (Hoopes, p. 31). Some of the varied techniques of instruction used in these models are puzzles,
games, role playing, stories, simulation, artifacts, music and art.

Since “students are also under great pressure to accommodate and assimilate into American culture in order to be accepted by their teachers and peers” (Finocchiaro, Bonomo, p. 157), teachers can often help reduce the stress of cultural and academic adjustment for both their students and themselves by learning about the child’s culture and history and by becoming knowledgeable about the second language acquisition process. The well-informed teacher realizes that listening is the first important step in learning a second language. Speaking English develops after listening comprehension is well established. Reading and writing skills are the last skills to occur in the language development process. Recognition of the language level ability of the limited-English-speaking student is vital in providing the necessary language skills to keep students progressing toward proficiency.

Finally, the classroom teacher needs to be aware of this time factor in learning a new language and adjusting to a new culture. It simply takes time. The classroom teacher must be patient and understanding and also have a realistic expectation for the child that is different.

Since the ultimate success of global education depends upon what happens in the classroom, educators everywhere need to promote a world where “. . . it is not bad to be different; it is only interesting to be different” (Martin, p. 8). “The essential point is that tolerance and appreciation of human diversity do not happen by chance, and that how teachers structure their classrooms as well as what they teach, can have a profound influence on children’s behavior and attitudes towards others” (Ziegler, p. 27).

REFERENCES


THE MATHEMATICALLY GIFTED CHILD

Martha Hodum

How can educators identify children gifted in mathematics, and what then is best and most feasible for the training and tapping of the talents of these young people?

In the 1978 Congressional Gifted and Talented Children's Education Act (Cassidy, Johnson, 1986), the term "gifted and talented children" means children and, whenever applicable, youth, who are identified at the preschool, elementary, or secondary level as possessing demonstrated or potential abilities that give evidence of high performance capability in areas such as intellectual, creative, specific academic or leadership ability or in the performing and visual arts and who by reason therefore require services or activities not ordinarily provided by the school.

Funding for giftedness is based on this federal definition coupled with individual state definitions which follow suit with some modifications. Kentucky still includes psychomotor ability (Cassidy, Johnson, 1986) which is usually amply provided for through local emphasis on athletics.

Donald Treffinger of the Center for Creative Learning (1981) uses Renzulli's three basic components of giftedness (above average ability, creativity, and task commitment) as an effective definition for guiding school practice.

General characteristics of the gifted (Greenes, 1981) include their fast-learning pace, keen observation skills, excellent memories, exceptional verbal and reasoning capabilities, well-developed powers of abstraction, ability to make intuitive leaps, willingness to take risks in exploration of new ideas, curiosity, preference for oral communication over written, and preference for complex problems.

Greenes (1981) stresses a distinction between the gifted student and the "good" student. The good student "goes to school well," is attentive, willing to help, "a good exercise doer," completes all assignments carefully in the prescribed time, and is a "pleasure to have in class." These above-average, academically talented, honors students should not be confused with the even faster, thoroughly gifted learner (Bartkovich, George, 1980).

Mathematical giftedness is a specific aptitude (Bartkovich, George, 1980) and may not carry over into other subject areas although it often does in areas of applied mathematics such as physics, chemistry, and engineering. Statistically, those gifted are in the upper one percent for their age group in reasoning abilities. They may use a variety of nonstandard approaches in problem solving; they tend to organize data into lists to discover patterns and relationships and be certain of all possibilities; they are able to apply information learned in one context to a problem in another context; and they generalize about observed relationships (Greenes, 1981).

The Johns Hopkins University Study of Mathematically Precocious Youth points to the Scholastic Aptitude Test (SAT) for college admission as a reliable means of identifying highly gifted junior high school students (Keating, 1974). Similar measures are needed to help make effective judgments about younger children (Trafton, 1981).

Mathematically gifted girls are often labeled "tomboys" (Fox, 1981) because of their analytical, unconventional, and independent ideas. Differences in male and female mathematical abilities (Aiken, 1987) are not pronounced before high school, but by the end of that period boys are superior to girls in mathematical computation and problem solving. Some biological differences have been noted (Aiken, 1987), but cultural attitudes most often discourage girls from higher level courses and competing with boys. Parents and teachers need to encourage their mathematically gifted girls. Both girls and boys need to be exposed to mathematically successful female role models.

It is often erroneously assumed that intellectually gifted children will progress and do well wherever they are placed (Wolfe, 1986). But the mathematically gifted waste time in a regular classroom setting going over topics already learned (Bartkovich, George, 1980); and this may lead to boredom and alienation from the learning process. While often given more "busy work" they should, in fact, be given fewer problems. The sequential nature of mathematics allows the gifted learner to build concepts rapidly, and learning is more dependent on intellectual ability than on chronological age or life experience (Bartkovich, George, 1980). Thus, the mathematics curriculum needs to provide for in-depth treatment of basic content along with correlating enrichment topics and/or acceleration (Payne, 1981). Higher-level cognitive thinking and higher-order reasoning skills should be pursued.

Acceleration becomes a near necessity (Payne, 1981) with the highly talented because of the "voracity" of their intellectual appetites.

The most common plan for acceleration allows completion of K-8 mathematical content in seven years, so that a full year of algebra can be taken in grade eight. Then the regular four years of high school mathematics can be completed at the end of grade eleven and advanced placement calculus in grade twelve (Payne, 1981).

Acceleration must be the student's choice (Bartkovich, George, 1980) and be backed by strong motivation. It must allow for the student to receive academic credit for what he has learned.
Acceleration can be accomplished through three avenues (Shufelt, 1981): independent study using a textbook; independent study through programmed, individualized materials, either print or computer presented; or grouping across grade lines with instruction provided by a teacher who is a mathematics specialist. The latter model, proven successful through the Study of Mathematically Precocious Youth (Bartkovich, George, 1980), is often a very fast-paced class where a group of homogeneous students meet once a week for two hours and actively participate in the development of concepts. Acceleration may even be carried out by grade skipping (Fox, 1974), subject-matter advanced placement, part-time or correspondence college courses for credit, or early college admission.

The most widely practiced method of planning for the gifted is enrichment of the curriculum (Fox, 1974). This necessitates individualization of the student's program and when properly developed can create a "new attitude toward mathematics" (Bartkovich, George, 1980), resulting in increased expectations as to what can be accomplished when the atmosphere is stimulating and challenging." Enrichment can be implemented in the regular classroom by the teacher or outside the classroom by a specialist teacher (Shufelt, 1981) with the purpose being to expose students to a greater subject depth and encourage independent thinking. The classroom teacher then must learn to recognize that students learn in different ways; create opportunities for exploration, inquiry, and problem solving; and make available challenging problems, materials, community resources, and mentors (Sansone, 1987).

Math classes can be grouped like reading classes. Later chapters of the text often not reached by the end of the school year could be assigned. The world of recreational mathematics materials in the library may be introduced (Fox, 1981). Math challenges in the classroom, school-wide, and regional levels should be promoted (Cohen, 1985). An active school or area math club can offer important peer group acquaintances and interactions to stimulate new ideas.

Teachers and schools should subscribe to periodicals such as Arithmetic Teacher and build an easy-access resource library along with books such as Richard W. Copeland's Mathematics and the Elementary Teacher (Waters, 1981). Treffinger (Sansone, 1987) is developing a "networking" program to help provide educators with a reference for the latest and best gifted materials. One such gifted program is the "Hands On Equation Learning System" (Borenson, 1987) which is an introduction to algebraic concepts and methods through a game-like approach for third grade and up. Computers in schools offer hopes for the emergence of well-written, carefully produced software programs designed for the gifted learner with individualization being realized (Shufelt, 1981). House (1981) describes other possible enrichments such as magnet schools, summer programs, and learning centers.

The specialist enrichment teacher or "catalyst" teacher (Treffinger, 1981) is one who is trained in materials, resources, and methods for the gifted. They may help to identify a course of action best suited to the individual student. They may work cooperatively with the classroom teacher and serve as a resource. Lack of funding for specialists in most local school systems leaves the enrichment to the individual teacher who often has neither the time or access to appropriate materials and who lacks specialized mathematics knowledge and training to work with the truly gifted child (Trafton, 1981). With the classroom teacher there is little overall planning or systematic treatment of content and no coordinated program from year to year. This enrichment approach is often no more than "cute little activities to fill up time" (Sansone, 1987).

Trafton (1981) notes that there are presently large numbers of specially trained teachers working with other kinds of special needs children; and, of course, the gifted athletic youth is not lacking in training opportunities. He projects that it is not unreasonable to expect similar treatment for the intellectually gifted children who currently number perhaps over 2 million (Wolfe, 1986f). Good teachers are the core of the successful enrichment program (Trafton, 1981). Wolfe (1986) stresses J.J. Gallagher's (1985) moral guidelines which the good teacher may encourage in the gifted learner: a joy and excitement about learning that will carry him through the drudgery and routine that is an inevitable part of learning, a sensitivity to the special responsibility to society that accompanies being gifted, and a respect for all children regardless of their ability. Acceleration and enrichment models ideally should be combined to meet the needs of the individual (Shufelt, 1981).

In the 1987 International Mathematical Olympiad Russia and the United States tied for first; West Germany placed third; and, in their first-time competition, China scored fourth (Stanley, 1987). Stanley predicts if China can preserve its current devotion to education of the gifted, by the year 2025 or earlier it may challenge the United States industrially far beyond what Japan has already done.

With mathematics being the only completely international language (Snow, 1970), every means should be made to identify and challenge our innately, mathematically gifted children. To neglect this educational necessity is to "throw away opportunities for national excellence" (Snow, 1970) and to waste precious minds.

REFERENCES


MANAGEMENT'S ATTITUDE TOWARD COLLECTIVE BARGAINING

Alan Coates

Collective bargaining is a process whereby representatives of management and its employees meet to discuss and negotiate the various phases and aspects of their relationship with a view to arranging a mutually satisfactory agreement that is acceptable to both parties (9). The process is generally associated with labor unions. However, with the advent of team or participative management style businesses, the process is also used without the intervention of a third party. To most people the process of collective bargaining appears to be a simple process. Actually it is both complicated and difficult. It should never be considered an end unto itself but merely one step in establishing a total relationship between the employee and the labor organization that represents his employees (9).

Before a total relationship can be properly developed, there are several steps that must take place. The essential steps are:

1. Organization, by election, of the bargaining agent for the employees desiring such representation. This process follows an established procedure and is conducted by representatives of the National Labor Relations Board.

2. The process of collective bargaining which leads to a mutually acceptable agreement.

3. Day to day bargaining, between management and its represented employees.

In his book The Labor-Management Handbook for Hotels, Motels, Restaurants, and Institutions, H.K. Witzky states that there are five basic areas or types of collective bargaining: Single Unit, Company-wide, Industry-wide, Area-wide and Coalition.

1) Single unit collective bargaining is used to establish an agreement for a single business or facility. All negotiations are local, and concern the single independent unit. A business that is represented by more than one union may, for the sake of convenience, combine at negotiation time and seek an agreement. This is an advantage to management in that it creates uniform labor conditions. The unions benefit from greater bargaining strength. Both parties benefit in time saving because they do not face a series of separate and concentrated actions.

2) The negotiations of a labor agreement that covers several similar operations, each at different locations but having a common owner, fall under the category of company-wide bargaining. An agreement of this type must be broad in its scope but as basic as possible since it is not possible to deal with the specific differences of each operation. Agreements of this type are not very common in the hospitality industry but may be used in the future by some of the small chains.

3) Industry-wide bargaining is used primarily by heavy industry. The negotiating teams are made up of industry-wide management officials with a chairman and unions with selected representatives from several levels, including national and international offices. Unions tend to favor industry-wide bargaining because their interests are generally quite common. However, local representatives are concerned as local issues are sometimes lost in the negotiations. Management is hesitant of this type of bargaining because preparation for negotiation requires that they reveal the financial aspects of their business, and it may require them to compromise their individual ideals or philosophies. Management is also concerned with the tremendous strength a union develops with consolidation and the increased bargaining power that results.

4) Area-wide bargaining is common to the innkeeping industry. It is usually found in a large city or resort area where a central group represents the employee hotels/motels and a central labor trades council represents all of the unions. Despite the drawbacks previously mentioned with union consolidation, the advantages of this type of bargaining seem to outweigh the disadvantages. By using this type of negotiation, wage competition among businesses in the area may be limited and the available labor supply may remain fairly constant. One disadvantage of an agreement of this type is that large and small operations are grouped together and the slant of an agreement may be favorable to the larger, more affluent operations.

5) Coalition bargaining is relatively unknown in the hospitality industry. Small and weak unions band together to try to increase their bargaining positions. The idea of a central industry labor council is an extension of coalition bargaining (9).

The objective of any collective bargaining session is to develop a series of sound and understandable goals. The basic objectives usually set up in labor agreements can be quite varied but tend to center around six common areas:

1. To establish the framework of rules and regulations covering everyday relationships that develop between labor and management.

2. To seek to maintain the stability of the business organization's purpose for a specified period of time.

3. To promote and continue to maintain harmonious and cooperative relationships between management and labor.

4. To establish the rights of management, labor and its representative union.

5. To establish the terms and conditions of employment for the benefit of management and labor.
6. To improve and maintain, at the highest levels of understanding, the business and economic responsibilities of management and labor (9).

Although all of these points may not be incorporated into an agreement, the degree to which both parties, management and labor, work to achieve precisely what they want to achieve through the agreement may affect the outcome of future negotiating sessions.

Each of the six objectives previously listed outlines a purpose for the agreement. In reality they only scratch the surface, for each of these points that has been condensed to one or two lines must encompass the whole spectrum of everyday relationships including human problems, personal grievances and unforeseen events which normally occur in the conduct of business. The agreement must also take into account the business climate and anticipated changes that may occur during its lifespan. It is, therefore, very important to be prepared with pertinent information when entering into a collective bargaining session.

The preparation for labor contract negotiations is a process of gathering the facts, preparing arguments and establishing the company’s position for the upcoming negotiations (3). This process may start several months prior to the negotiations and may generate summaries of activities that have taken place during the last contract period. A strike play may also be generated at this time. This whole process, however, addresses the labor relations climate as it currently exists. At the negotiations, the parties proceed to debate the issues and reach an agreement heavily influenced by what has occurred during the previous two or three years.

While this is the approach most negotiations follow, there are situations where it is not appropriate and additional efforts must be put forth in the preparation stage to create a more comprehensive program. Examples of this would include an operation that was suffering losses and must have wage concessions from its employees or a company that wants to implement a productivity incentive program. In cases such as these, the company must take a more aggressive approach. The aggressive approach must include an audit of the current labor relations climate. This can be done by talking to management personnel with special emphasis on the comments from first and second level supervisors. They can give critical insight into any areas that now contain deficiencies that can be eliminated in the new agreement. This influence cannot be developed in a short period of time but should be an ongoing part of business operations. This audit should also identify any specific behavior or condition that should be corrected. A list of goals and objectives based on the audit and corporate direction should also be developed prior to the start of any negotiations.

As part of the preparation the negotiating team should meet and get to know something about the opposing team of negotiators. They should become familiar with points of view, personalities, scope of authority, and try to understand the way of thinking of the opposing team. By performing this analysis, the negotiators can prepare arguments and data more objectively. It is also beneficial to study other contracts for similar businesses to see what has been established for other operations. The Bureau of National Affair’s Collective Bargaining, Negotiations and Contract Service is an excellent source for these contracts. Since wages are the principle issue in any negotiation, keep abreast of local as well as area and national wage rates and changes. Because job classifications and titles differ, make certain that salaries for positions are properly identified.

It should be a goal of every collective bargaining agreement to increase the understanding between labor and management in order to foster good relationships rather than to maintain the status quo. As both management and labor grow and mature under an agreement, they seek to strengthen their positions. The aim of labor unions is to add to the benefits gained in bargaining over the years. Management in turn seeks to improve such things as productivity, competitive position, and quality to maintain a favorable earning and growth record. The development of a favorable labor relations climate by establishing a credible management group can make further negotiations much more productive. The day to start preparing for future negotiations is the day you sign the current agreement.

Negotiations are generally conducted by a group of representatives for both parties. A moderate sized group is best. If the group is too large, it becomes unwieldy and all of the various points of view may only confuse the issues at hand. Unions tend to prefer a large group because it serves to assure the rank and file that no special deals or collusion were part of the negotiations. A large group also helps the union to sell the final agreement.

Whatever the size of the group, there are certain principles that all negotiators should follow. One of the first principles is that of “good faith.” This principle simply means that no unfair advantage will be taken by either side. The demonstration of a firm belief in this principle can mark the difference between success and mediocrity. In addition, negotiators should be honest, sincere, patient, and firm. It is imperative that the manager be a part of the negotiating team since he is principally responsible for a profitable operation and has to live with the agreement every working day.

The time spent by management in preparatory meetings is very important as it sets the stage for the beginning of actual contract negotiations.

The actual negotiations should take place in the company conference room or a conference room that is off the premises but paid for by the company (5). The first series of meetings should establish an atmosphere of understanding. A time, place, and total time frame for the meeting should be set and agreed upon in advance. Records should be kept of just what transpires and is accomplished at the first and all subsequent meetings. The company team should be prepared with a list of management demands but these should be held back until the union demands have been presented. Getting the feel for the various demands
may take several sessions. Management will want to explore thoroughly the nature and extent, as well as the intent of each demand. The time used to analyze these demands will be well spent. Frequently, it is while analyzing these demands that management uncovers just how deeply seated and important these demands are.

The second series of meetings should be used to draw out the union, to get the "feel" of what the union believes it must have and what issues are bargaining chips. The emphasis should be on your desire to understand the union correctly.

At the third series of meetings the company's issues should be presented. Little or no reference should be made to union proposals unless they can be used to reinforce company proposals in order to establish a common ground.

In all subsequent meetings the issues presented are discussed one at a time. Proposals and alternatives are reviewed and solutions reached. When both parties agree on an issue it is recorded and set aside for incorporation into the final agreement. The specific issues in a labor contract are tailored to a given business or industry. There are several common clauses found in all contracts. These clauses spell out the basic rules which the business and union will follow. Examples of these clauses are:

- Parties to the contract - the union and the employer.
  The bargaining unit - names union as sole bargaining unit.
  Seniority - defines as straight, departmental, limited, or other type.
  Holidays - list days plus special compensation.
  Vacations - list days plus special compensation.
  Grievance procedure - processing procedure and time limit.
  Arbitration - who will mediate if normal grievance procedure does not settle the problem.
  Wages - wage scales, incentive plans, etc.
  Discipline and Discharge - reason for, penalties.
  Termination date - the date the contract will expire.

The basic clauses and specific issues are written out in great detail and as a result the final agreements can become quite long.

Occasionally an issue of negotiation will become so controversial that all attempts to resolve it seem impossible. When this occurs a complete recess may be in order. This recess must be agreed to by both parties. This is often called a cooling-off period. It does not mean that the negotiation process is cancelled but allows both parties time to step back and look at the situation from a different perspective. At the end of the cooling off period, negotiations resume, and hopefully the issue will be resolved.

In a real stalemate all of the facts may be given to a third party. The Federal Mediation and Conciliation Service, an agency of the United States Department of Labor is often used. The use of a mediator requires the agreement of both parties but can be very helpful in settling difficult issues. The mediator can also be useful in resolving labor-management relationship problems.

In a Monthly Labor Review magazine article, Messrs John Stepp, Robert Baker, and Jerome Barrett state:

Mediators are uniquely positioned to detect the danger signals emanating from a poor labor-management relationship. When involved at the collective bargaining table in dispute mediation, the mediator can make a reasoned judgement as to the nature of the relationship behind the conflict. This is done by examining the issues, assessing each side's internal relationships and testing and verifying these impressions through indepth private discussions with both parties (6).

If difficult negotiations are anticipated, a mediator may be present from the beginning of the negotiations.

The process of collective bargaining is a long and sometimes slow process but if conducted in the proper manner and atmosphere can yield agreement advantages to the employer. There are several basic guidelines to remember.

1. Be prepared with a list of specific goals that you want in the next contract. Proposals that can be offered to meet these goals should be prepared and presented at the third series of meetings.
2. Focus on winning, allow sufficient room to negotiate but be firm, insist on a corresponding concession before agreeing to a union demand.
3. Draft a contract that is readable and useable. Clearly define guidelines for employee eligibility, qualification and disqualification of benefit plans, and list just causes for discipline.
4. Be patient and never lose your cool. Beware of dramatics such as table pounding and screaming which are designed to intimidate or anger you.
5. Keep complete notes of the proceedings: The National Labor Relations Board tends to believe the side that keeps the best notes (7,8).

The trend of business today is toward participative management, and unions are declining in influence and membership. The unions appear to be "out of step with the times" by failing to address the issues that are uppermost in the minds of the people they are trying to serve. Unions continue to address job security and more money as the major issues while the group they are trying to organize is also concerned with job satisfaction (1).

Collective bargaining agreements that are negotiated in today's business climate are indicating wage increases in the 4½ to 5½ percent area, shared benefit costs, and more participation in day to day operating decisions by employees. This is a significant change in collective bargaining agreements of the previous ten to fifteen years. The major unions of a few years ago are losing their ability to set
the trend in settlements. This position has not been assumed by other major unions. As a result, smaller employers are able to customize their labor agreements (3).

Management has a distinct advantage in today's business/labor climate. If management takes the lead by responding to employee needs and remembers that they are not just handling problems but dealing with people, collective bargaining agreements can continue to benefit management.

REFERENCE


4. Guidinger, J. 1985. Interview with Personnel Manager, 3-12-85, Country Oven Bakery, Bowling Green, KY.