A Comparative Analysis of Causal Attribution Between Post-Secondary Students Diagnosed with a Mild to Moderate Traumatic Brain Injury and Students without a Mild to Moderate Traumatic Brain Injury.

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ABSTRACT

The focus of the study consisted of a comparative analysis of the causal attributions of students who have, and have not, been diagnosed with a mild to moderate traumatic brain injury (M/MTBI). The experimental and control groups were matched on age, gender, and educational setting. Brain injury was measured by diagnosis and medical assessment. Causal attribution was ascertained through personal responses to a scenario-oriented dimension scale. Causal attribution in a failure situation was examined using three dimensions: locus, stability and controllability. Controllability was further divided into personal and external control.

Students with a M/MTBI attribute the cause of failure significantly more to an internal, stable and uncontrollable cause; however, there was no significant difference with external control. Attributing failure to an internal, stable and uncontrollable cause can create a sense of helplessness and emotional distress. It is important for counsellors, instructors and peers to develop a better understanding and acceptance of students diagnosed with a M/MTBI. With deeper understanding comes acceptance and the opportunity for students to succeed and learn new ways to cope with the diagnosis of an injury. This research will broaden the domain of causal attribution and advance the theory where there is currently no attributional research. Through the completion of this study other researchers should be able to replicate and expand future exploration in the area of causal attribution as it relates to M/MTBI.

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INTRODUCTION

Over the past twenty years there has been considerable growth in psycho-educational research on causal attribution. This attention is closely related to a growing awareness among educational professionals that the style of an individual's attribution can lead to coping difficulties. These coping difficulties include learned helplessness which often occurs when individuals repeatedly experience failure in educational settings.

Students who have developed learned helplessness, due to their causal attributional style, lower their aspirations of future success, have a tendency to drop out of school and avoid situations where they may experience failure (Weiner, 1992). Individuals experiencing this phenomena limit their aspirations in such areas as schooling, career opportunities, job training, and socialization with others. Consequently, there appears to be a need for research on how causal attribution relates to students who have a history of educational difficulties and develop learned helplessness in the classroom. A number of these students with "special needs" have been identified with labels such as brain injured, dyslexic, attention deficit or some other possible form of learning difficulty.

One of the major challenges for counsellors working with individuals who have been diagnosed with a mild to moderate traumatic brain injury (M/MTBI) is to help them with life transitions.

The diagnosis of a M/MTBI can exert a devastating effect on many people, resulting in feelings of helplessness, as seen in the writer's personally conducted counselling sessions. It is important to be aware of factors, such as causal attribution, in order to understand better clients and help them move toward a positive view of their situation instead of stagnating in a sense of helplessness.

During counselling sessions, clients communicated feelings of fear and anxiety about their re-entry or continuation in courses following their brain injury. Clients felt that peers and instructors would view them as lacking in intelligence, and they did not want to be readily identifiable in the classroom. One client felt that she could not endure experiencing even intermittent failure as a student, considering her academic successes before the accident. These feelings of helplessness have been theoretically and empirically linked to the individual's causal attribution (Abramson, Seligman & Taesdale, 1978).

When individuals attribute failure to something as seemingly internal, stable and uncontrollable as a brain injury they may feel immobilized and helpless. Due to the internal, stable and uncontrollable quality of a M/MTBI, it is likely that these students would attribute failure differently than would people who had not sustained a M/MTBI; however, there apparently has been limited research designed to examine whether or not there exists a difference in attribution style between these two groups. Empirical confirmation

of this difference could contribute to a theory of helpless behavior of individuals who have experienced a brain injury.

The purpose of this research is to develop a greater understanding of students who have experienced a M/MTBI and their causal attributions in failure situations. A deeper understanding of the student's attribution should assist in re-directing a progression toward helplessness. This research will broaden the domain of causal attribution and fill a gap where there is currently no attributional research. Through the completion of this study other researchers should be able to replicate and expand future exploration in the area of causal attribution as it relates to M/MTBI.

This study is a comparative analysis of the causal attribution of post-secondary students who have been diagnosed as having sustained a M/MTBI and those who have not. The study concentrates on three aspects of causal attribution: i) individuals' locus of causality; ii) the stability of the cause of their failure; and iii) their feelings of control over the cause of their failure. The following research question, which was derived from the literature, guides the initial research process: *Is there a difference between the causal attributional style of post-secondary students who have been diagnosed as having sustained a M/MTBI and those who have not sustained a M/MTBI?*

CHAPTER I

REVIEW OF THE LITERATURE

The theoretical framework for this study is derived from the work of Weiner (1979, 1980a, 1980b, 1980c, 1986, 1992). The first section of this chapter includes the nature of causal attribution as presented by Weiner and his associates. Recent evolutions of Weiner's theory are also described in the review of McAuley's elaboration on the dimension of control. The second part of the chapter contains the grievance with research already undertaken and the rationale for matching subjects. The research hypothesis is presented in the final section

Weiner's Model of Causal Attribution

The majority of research concerning the theory of causal attribution was based on the early works of Heider (1958), Jones and Davis (1965), Kelly (1967) and Rotter (1966). Heider and Kelly's research was instrumental in the development of Weiner's three dimensional attribution theory, which constitutes the theoretical framework for the present study (Rosenbaum, 1972; Rotter, 1966; Weiner, 1979; Weiner Frieze, Kukla, Reed & Rosenbaum, 1971). The structure of the theory and the model is based on locus (internal or external to the person), stability, and controllability. These dimensions are described below. In addition McAuley, Duncan and Russell's (1992) extension of Weiner's

theory concerning the dimension of personal and external control is also examined.

Locus. Locus was the first identified dimension of causal attribution originating from Heider's (1958) view of action being dependent on two factors, the first being the individual and the second being the environment. Kelly (1965) described locus as a continuum with internality at one extreme and externality at the other.

Weiner defined locus as the dimension which allows the attribution of the causes, related to success or failure (achievement), to either the individual's personal character (internal) or outside forces such as the difficulty of the situation (external) (Weiner, 1986). An example of locus of causality associated with achievement is illustrated by individuals attempting to succeed in an examination. A pass or a failure can be attributed to their temporary exertion and aptitude (internal) or the complexity of the examination questions (external). If people fail a presentation due to shyness they would attribute that to the internal cause of being shy. Failure of a presentation due to a poor teacher would be an external cause residing outside of the students.

Stability. Weiner *et al.* (1971) believed there were limitations to causality being identified only within the confines of locus; and consequently, expanded the dimensions of causality by introducing the concept of stability. Weiner *et al.* observed fluctuation in stability concerning attribution of causes of success or failure to internal and external loci. Stability indicates whether a causal attribution is a

constant, static variable, or one that fluctuates. This dimension is hypothesized to influence the expectancy for future achievement (Weiner, 1986). Stability is also associated with distinguishing the different ways in which individuals attribute the cause of success compared to failure. "Healthy" individuals usually prefer success to be stable; consequently, they will attribute it to a cause that is constant. Failure is predominantly attributed to unstable causes that do not regularly occur (Weiner, 1992).

The internal causes for achievement could be illustrated by temporary exertion (studying) and aptitude. Temporary exertion is exactly that, temporary, and therefore an unstable attribution. Aptitude was considered by Weiner (1992) to be a trait which is usually stable. The student's success or failure can also be identified with the external causes of luck (unstable) and program requirements (stable). Luck is considered to be an unstable and external cause of success or failure because, for example, when students guess a response, especially multiple choice, they have a chance of either guessing correctly or wrongly. If the program requirements are consistent, the cause for failure or success is deemed to be external and stable. (Weiner *et al.*, 1971).

Locus and stability formed a more complete theory of causal attribution as illustrated in Figure 1 (Weiner, 1986).

	Internal	External
Stable	Aptitude	Objective Task Characteristics
Unstable	Temporary Exertion	Chance

Figure 1. Locus and stability classification. A scheme for the perceived causes of achievement outcome.

Controllability. Building on the work of Rosenbaum (1972), Weiner suggested a third dimension to his model which took into consideration the controllability of the individual's causal attribution (Weiner, 1986). The idea of controllability (Weiner, 1979) is evident in regard to the internal locus of causality. Aptitude, for example, is considered by many to be a stable-internal cause. Even though this cause is internal, aptitude is not considered controllable. If failure is perceived to be due to uncontrollable causes, individuals may assume a position of helplessness in their outlook for future success and believe failure to be the only outcome possible. Aptitude is an example of an uncontrollable, stable and internal factor for success or failure, as illustrated in Figure 2.

	Stable	Unstable
Uncontrollable	Aptitude	Tester bias poor conditions
Controllable	Long term effort Laziness/Indust.	Temporary Exertion

Figure 2: Internal causes of success and failure according to stability and controllability

Controllable, internal causes of success or failure may be represented by laziness and temporary exertion. If individuals attribute the cause of their failure to constant lack of effort, they interpret the cause as stable; however, they still have control over the amount of energy they exert.

Personal and External Control. The use of controllability appears to be compatible with internal causality; however, external causes seem to be relatively uncontrollable. Weiner (1986) felt that to label external causes as completely uncontrollable would be ill-advised. Individuals may not sense that they personally have control over external causality; yet, they may feel that someone else has control. Teachers and counsellors may exert external control over a grade or the resolution of a social dilemma, while at the same time, the individual still senses a lack of personal control.

The division of control into personal and external control was further developed by McAuley *et al.* (1992) in their Revised Causal Dimension Scale (CDSII). They divided the dimension of controllability into two parts to eliminate confounding responses between locus and controllability. The scale was developed to measure the individual's causal attribution quantifiably and objectively. McAuley believed that Weiner's description of the relationship of the locus and control dimensions was a catalyst for the discovery of personal and external control.

> The notion of controllable-uncontrollable by persons or others generally follows the theoretical guidance of Weiner, who cogently distinguished between the locus of causality and controllability dimensions. However, control can be further defined along separate dimensions conceptualized as personally controllable-uncontrollable and externally controllable-uncontrollable (McAuley & Shaffer, 1993, p. 476).

If students fail a number of examinations due to what they perceive as being their teacher's continued bias, the bias is still controllable. The control over the failure resides in the teacher (external) which means that students sense a lack of personal control. The teacher has control over the bias and the students exert no personal control.

McAuley considered the four dimensions of locus, stability, personal control and external control to be related to each other (McAuley *et al.*, 1992). During the development of the CDSII McCauley *et al.* (1992) calculated the correlations among the factors as illustrated in Table 1.

Table 1
Correlations Among the Factors for the CDSII.

	Locus of Causality	Stability	Personal Control
Stability	.002		
Personal Control	.711*	-.328*	
External Control	-.646*	.156*	-.558*

*p < .05

Note. Adapted from McAuley (1992)

Based on the correlations found by McAuley *et al.*, there was a relationship between the four dimensions of causal attribution. McAuley *et al.* indicated that as personal control increased so did the locus of causality (the higher the score the more internal, stable, and controllable the cause). As personal control increased the dimension of stability decreased. As external control increased locus and personal control decreased while stability increased. Stability and locus of causality were not found to be significantly correlated.

According to the literature causal attribution following success should not be considered to be synonymous with the same as causal attribution following failure. Weiner (1986) noted that an individual's causal attribution usually differs depending on whether it is applied to success or failure. The two situations differ and are dependent on the setting as well as the person involved (Weiner, 1986, 1992). There is also an intrinsic aspect to humans that makes them attribute the cause of failure and success differently. This intrinsic aspect is referred to as the hedonic bias. This bias helps individuals protect themselves from a negative psychological response to failure and consequently, to enjoy success. It is defined as follows:

> The hedonic bias (or error) also is known as the self-serving attribution bias, ego enhancement, ego-defensiveness, and beneffectance. The concept refers to people's tendency to take

> more credit for success than they do responsibility for failure. It is presumed that this pattern of ascriptions maximizes the pleasure linked with success and minimizes the pain generated by failure (Weiner, 1992, p. 244-245).

The difference in attribution respecting success or failure is illustrated in the following example. A student with a M/MTBI fails an examination and subsequently attributes the cause of the failure to the injury which is internal, stable and uncontrollable. The same individual will probably not attribute success to the injury. If the student is unaccustomed to succeeding, the cause may be interpreted as the result of chance which is external, unstable and uncontrollable. If the individual attributes success to effort the cause is internal, unstable and controllable. The prominent variable is the stability of the causal attribution; however, locus and controllability can also change depending on the individual and the situation.

The focus of the present study centers on failure which can exert a detrimental effect on students with, and without a M/MTBI. The purpose of this study is to apply the theory of causal attribution and expand the concept into a theoretical model concerning M/MTBI. An understanding of the causal attribution of students with this form of injury can suggest new ways of counteracting student helplessness and avoidance following failure. As others learn more about M/MTBI

individuals experiencing this condition should be more accepted and encouraged to develop to their optimum.

Grievance With The Research.

A review of the related literature has provided evidence which supports the need for research to be conducted in the area of causal attribution with individuals who have been diagnosed as having a M/MTBI.

With regard to the present research, there appears to be evidence of at least four areas of grievance with the literature: **i)** difficulties in reaching consensus as to the cause of cognitive deficits following the occurrence of a M/MTBI; **ii)** an apparent lack of research concerning causal attributions of subjects diagnosed with a M/MTBI, while other diagnoses such as cerebral palsy, dyslexia, and attention deficit have been subjected to considerable attributional research; **iii)** researchers and "significant others" (family, friends, teachers..) who interpret the causal attribution of individuals without understanding the subjects' interpretation of their own causal personal attribution; and, **iv)** synonymous and interchangeable use of the terms causal attribution and locus of control. In this section these four "grievances with the research" will be examined.

Difficulties in Reaching Consensus as to the Cause of Cognitive Deficits Following the Occurrence of a M/MTBI

In essence, the research appears to be divided on the issue of the causes of cognitive deficits following the occurrence of a M/MTBI. Many researchers appear to have begun their investigations with a seemingly persuasive and enticing assumption that an injury to the brain contributes directly to resultant cognitive deficits. As a result, a direct correlation between the severity of the injury and the resultant degree of impairment can be defined (Rutter, 1981). Others appear to be of the opinion that while brain damage will produce identifiable results, major cognitive deficits result more from a psychological or attributional response to the injury than from the injury itself (Beers, 1992).

The cognitive decrements following a head injury and the difficulties of clearly understanding and defining their relationship to a M/MTBI were examined in a study conducted by Beers (1992). Her study was concerned with research on the causal relationship between cognitive deficits and a brain injury in terms of a predictable response predisposition to a stressful event. Beers demonstrated the difficulty in determining whether post mild brain injury deficits are caused by the injury or were evident before the injury. Beers challenged researchers such as Rutter (1981), who in earlier research suggested that the causes

of post injury deficits could not be attributed solely to the trauma that the person received.

Beers and other researchers (Boll & Barth, 1981; Rimel, Giordani, Barth, Boll & Jane, 1981; Rimel, Giordani, Barth & Jane, 1982) questioned Rutter's conclusions after finding new evidence which suggested that M/MTBI patients may also attribute their deficits directly to the trauma experienced. This new information clarified the subjects' tendency to attribute most if not all failure to internal, stable and uncontrollable causes, leading to an increase in anxiety and depression. Consequently, further difficulties result from an interaction of deficits caused by the trauma and the subject's psychological response to the event.

> In other words, when an individual's basic and higher level cognitive processes are affected, an increase in anxiety and depression becomes more probable [...] individuals whose defense mechanisms are constricted prior to injury, allowing limited coping under relatively unchallenging conditions, or whose identities are defined by rigid ego dynamics may be particularly affected by the sequelae of MHI (Beers, 1992, p. 290).

Beers stipulated that complaints following a M/MTBI are the result of both organic and psychological interactions, the latter of which was seemingly overlooked by previous research studies.

Processing damage following the diagnosis of M/MTBI was evident in research undertaken with children and adolescents. Beers (1992) and Gulbrandsen (1984) suggested decreases in cognitive functioning related to complex nonverbal tasks, with time constraints, in M/MTBI as well as in severely brain injured children.

> These studies of the neuropsychological sequelae of MHI seen in children as well as adults began to call into question Rutter's hypothesis of a threshold effect above which occurs a linear relationship between various indices of severity and outcome [...] outside the sphere of severe brain injury, defined as an obvious destruction of brain tissue and loss of consciousness of greater than one month, the sequelae of head injury are not perfectly correlated to the severity of cerebral insult (Beers, 1992, p. 294).

The observation that outcome and severity of brain injury were "not perfectly correlated" raised questions about the role played by psychological responses and, consequently, the reliability of conventional injury severity scales as predictors of outcomes.

In terms of educational and social repercussions, Klonoff, Low and Clark (1977) identified continuous behavioral difficulties following severe to mild brain injury among children and adolescents. The two age groups experienced severe difficulties with learning following their injury. After five years, twenty-five percent of the entire sample of younger children failed a grade or were sent to remedial classes, while

seventy percent of the adolescents with failing grades left school. These children and adolescents had no previous (pre-injury) scholastic difficulties. Largely due to the lack of acknowledgment that difficulties can be overcome with proper rehabilitation of psychological responses to the injury, a sense of helplessness set in which evidently caused the individuals to avoid the setting where there was an occurrence of failure (Abramson, Seligman & Taesdale, 1978; Andrews & Debus, 1978; Mikulincer, 1989). Levin and Eisenberg (1979a, 1979b) found evidence of residual cognitive impairment in adolescents with brain injuries six months post injury. The adolescents manifested cognitive damage which generated an evident bearing on their educational and general adjustment. Their lack of adjustment and frustration appeared to be due not only to the physical trauma but also to the increasing psychological distress of the individual.

The psychological distress of individuals diagnosed with a M/MTBI was evident in a study by Fuld and Fisher (1977) in which a change in personality of a brain injured child was identified. Following the child's electroencephalograms and neurological assessments return to normal, the child experienced increased aggressive behavior. This behavior improved only after the child's cognitive, linguistic, motor function and psychological scores reached a normal level. Similar results were found by Slater (1989) who followed the progress of an eighteen year old female after she sustained a mild brain injury. The degree of severity of her injury was diagnosed using

the Glasgow Coma Scale (GCS), an emergency room assessment instrument, which measures severity of the brain injury according to a fifteen point scale. A score from eight to fifteen indicates a M/MTBI. Slater's female subject experienced only a ten to fifteen minute loss of consciousness and received a GCS score of fifteen (mild). Even with a mild injury the individual found her differing cognitive ability psychologically distressing, as reported by Slater.

> Paradoxically, as she made cognitive gains during her recovery period, she became more psychologically distressed as measured by the Brief Symptom Inventory. This distress appeared to be related to an increasing awareness of her cognitive difficulties, which became evident when she entered college (Beers, 1992, p. 307).

The subject expressed self-concern during testing; however, she was reported to be cooperative. Her academic record before her injury revealed no grade failures or remedial instruction; however, it appeared that her distress could have been related to an ever-increasing sense that failure was due to her injury an internal, stable, personally and externally uncontrollable cause. McAuley's model of causal attribution was supported by Slater's research. Findings suggested that the subject attributed the cause of her failure to the repercussions of mild brain injury. It was noted in additional research that adolescents

and adults with brain injuries accomplished high levels of achievement when tested for attention and processing; however, they experienced difficulty maintaining their standard of performance. This loss of ability caused torment and helplessness (Stuss, Stethem, Hugenholz, Picton, Pivik & Richard, 1989).

In summary, while researchers, notably Rutter (1981) have postulated that cognitive deficits result directly from a M/MTBI, a growing body of research appears to be suggesting that the cognitive deficits may result from the psychological response which has been made to the injury. The suggestion appeared to be that this psychological response may be in the form of causal attribution. If causal attribution plays a role in the rehabilitation of subjects who have experienced a M/MTBI, what is the nature of that attribution? Is it, as has been suggested by Beers, internal, stable and uncontrolled?

An Apparent Lack of Research Concerning Causal Attributions of Subjects Diagnosed with a M/MTBI

Outside of the foregoing research there appears to be limited exploration concerning the relationship between brain injury and causal attribution; however, there appears to be a number of research reports concerning the construct of locus of control (Kelly, 1973; Weiner, 1986; Lubusko, Moore, Stambrook & Gill, 1994; More and Stambrook, 1992; More, Stambrook & Wilson, 1991).

There has been extensive study in other populations of disability including those categorized as "mentally retarded," "physically disabled," and "learning-disabled". Ostensibly, these could impart possible indications of what to anticipate in future research of attribution in the largely non-researched area of M/MTBI.

Considerable research has been completed on causal attribution with individuals labeled as "retarded". Hoffman and Weiner (1978) examined the effects of attributions for success and failure on "retarded" adult performance utilizing Weiner's three dimensional model of causal attribution (locus, stability and controllability). This was one of the first trials of Weiner's three dimensional model making their investigation original in comparison with prior research that implemented locus as the only dimension of causal attribution. The results of the study illustrated the importance of effecting attributional shifts through instructor feedback. Positive feedback increased performance regardless of intellectual capacity.

People who sustained an injury that caused physical impairments also experienced feelings of helplessness and depression. These feelings were apparently precipitated by attributing their failures to their disability, which was considered to be internal, stable and uncontrollable (Johnston, 1985). Johnston demonstrated that individuals who experienced disabilities in reading exhibited multifaceted difficulties. Causal attribution was seen as an integral aspect of their difficulties that contributed to helpless or passive

responses to failure in learning. Johnston's research was limited in that it was conducted using only three case studies. This may be considered to hinder generalizability and replication to a population not represented by the sample of three subjects. Despite Johnston's utilization of a small sample, however, other researchers supported his findings. Examining subjects with more severe physical impairments, researchers found similar results concerning causal attribution and physical difficulties (Agrawl & Dhar, 1983; Dummer, Ewing, Habeck & Overton, 1987; Kunnen, 1993; Stone & Moser, 1982).

Dummer *et al.* (1987) conducted an investigation examining the attribution style of athletes diagnosed with cerebral palsy. A screening process for subjects was not used by the authors. The model of attribution used in the study was Weiner's (1972) locus and stability dimensional prototype, which meant that control was not included when examining attribution. Dummer *et al.* found no gender differences in attribution; however, this was possibly due to similarities in socialization within the population. Differences in attribution were found between different classes of athletes. The more disabled the athlete the greater the emphasis that was placed on luck and time spent working on skills.

> The use of external attributions by the more disabled athletes may suggest that they recognize that performance may not be fully under their control. However, the more disabled athletes

> are aware that continued practice may be important in gaining control of their skills. The less disabled athletes employ unstable attributions which focus on unstable aspects of ability and luck relative to the situation (Dummer *et al.*, 1987, p. 289).

There was acknowledgment, in Dummer *et al.*'s study, of the need for shifting attribution to an unstable, internal locus of attribution (such as effort) to lessen anxiety and gain control and self-esteem. This position shifting attribution to an unstable, internal locus of attribution appears to be given additional credence by other researchers (Andrews *et al.*, 1978).

To summarize, research into related areas of difficulty, other than M/MTBI, suggests that subjects frequently attribute their failures in performance to internal, stable and uncontrollable causes. While little research appears to have been conducted with subjects who have experienced M/MTBI, it might be assumed that effecting a shift from attributing failures to internal, stable and uncontrollable causes to internal, unstable and controllable causes might prove to be effective in the psychological rehabilitation of these subjects. This rehabilitation could be effective if, indeed, M/MTBI subjects attribute their failures to internal, stable, and uncontrollable causes.

Interpreting the Causal Attribution of Individuals without Understanding the Subjects' Interpretation of Their Own Attribution.

A difficulty with existing research is that a number of researchers apparently interpreted the causal attribution of individuals without understanding the subjects' interpretation of their own causal attribution. A researcher may interpret effort to be internal, unstable and controllable; however, the individual may have difficulties sustaining effort due to a disability such as a M/MTBI. This individual may attribute failure to an internal, stable and uncontrollable cause. The researcher in this case may have unwittingly ...

> ...[committed] what Russell (1982) has called 'the fundamental attribution error' (i.e., making the assumption that the researcher perceives causes in the same way as the respondent). In a more appropriate methodology, the respondent would directly indicate how he or she views the attribution in terms of the causal dimensions (McAuley *et al.*, 1992, p.566).

Hayes and Prinz (1976) postulated that students labeled as "retarded" would differ from non-labeled students in their attribution for success and failure. The researchers concluded that success and failure were viewed differently by "retarded" and "non-retarded" pupils due to subtle differences in teacher interpretation of the

"retarded" label. Their investigation was weakened by what might be identified as an intervening variable: the response of observers to the label rather than the observed effect of the label on the subjects themselves. Whether the response of observers is or is not part and parcel of the label has apparently been the subject of much continued debate (Rosenthal & Jacobson, 1968; Garner & Bing, 1973). Despite its weaknesses, however, the Hayes and Prinz study apparently provided impetus for investigations concerned with the effect of frequently misleading observer interpretation of failure and success of students (Bromfield, Weisz & Messer, 1986; Elam & Sigelman, 1983; Gibbons, Sawin & Gibbons, 1979; Luftig, 1983; Palmer, 1979; Severance & Gasstrom, 1977; Weisz, 1981).

The lack of subject explanation concerning causal attribution can lead "significant others" (family, friends, employers...) to faulty conclusions concerning the subject. These conclusions exert detrimental effects on the subject. In several studies it was noted that "significant others" often interpret failure by "retarded" children in ways that lead them to condone resultant feelings of helplessness on the part of these children (Abramson, Seligman & Taesdale, 1978; Elam & Sigelman, 1983; Weisz, 1981). Adults appeared to focus on the internal stable attribute of ability. When adults seek to explain a "retarded" child's failure, especially if they perceive low mental ability as being the most salient cause, they may discount the role of the other internal unstable causes (*e.g.*, low effort), focusing, instead, on the

stable internal attribute of ability. Results have indicated that adults frequently consider a "retarded" child, even with a mental age similar to that of a "non-retarded" child, to be inferior to the "non-retarded" child in intellectual ability (Weisz, 1981).

In large part this "fundamental attributional error" may be due to a unconscious response on the observer to the effect of labeling. Luftig (1983) found "non-retarded" students more likely to be accepting of disruptive defense mechanisms if the individuals displaying these tendencies were labeled "retarded". Almost predictably, the authors did not indicate if "retarded" pupils were asked if they would be more accepting. Perhaps the label "retarded" deterred the researchers from pursuing the question.

The benefits of subject explanations concerning causal attribution were illustrated by Bordieri and Kilbury (1991). The authors did not use the CDSII; however, they found that adult clients who demonstrated an internal, controllable locus of causality were considered to be more successful in their rehabilitation than were clients reporting other attribution causality. In what must be viewed as a positive incident of observer explication of causality, health care workers interpreted these individuals as taking proactive control of their recovery and having more knowledge about their injury. This might be interpreted as health care workers supporting independence on the part of the clients and therefore breaking the cycle of condoning helplessness.

To summarize, research conducted to examine the causal attribution of individuals should include the interpretation of the cause by the subjects involved. The importance of avoiding "fundamental attributional error" was noted and it was deemed appropriate to utilize an instrument designed to assess subjects' causal attributions for their failure, thereby avoiding potential observer bias.

Synonymous and Interchangeable Use of the Terms Causal Attribution and Locus of Control

There exists a fourth area of concern in regard to the synonymous use of the terms causal attribution and locus of control. Weiner and other researchers believed that the two concepts should not be considered as being synonymous. Considering the use of controllability in Weiner's (1979, 1986) descriptions of causal attribution there have been many researchers who have found it necessary to explain the differences between causal attribution and Rotter's locus of control (Weiner, 1979; deCharms, 1981; Wong and Sproule, 1984). There seems to be confusion even today amongst researchers who believe that causal attribution and locus of control are synonymous; according to the theory this is fallacious. Locus of control only examines one dimension of causal attribution. It contains only the dimension of locus while causal attribution contains the additional dimensions of stability, personal control and external control.

Luchow, Crowl and Kahn (1985) conducted a study dealing with learned helplessness among students labeled as "emotionally handicapped" (EH) and "learning disabled/emotionally handicapped" (LD/EH). In order to derive causal attribution for success and failure, the authors used the Intellectual Achievement Responsibility Questionnaire which purportedly measures perceived locus of control of academic outcomes (Crandall, Katkovsky & Crandal, 1965). Luchow *et al.* appeared to confuse the different concepts of locus of control and causal attribution. This probably exerted a confounding effect on their results. No significant differences were found to exist between groups for locus of control; however, it might be contended that, had the researchers extended the "locus" concept to the related concepts of stability and controllability, differences might have been found.

In support of this contention, other researchers discovered that, although both ability and effort are considered to be internal, children labeled as "learning disabled" attributed failure significantly more to a lack of ability (stable and uncontrollable) than to a lack of effort (unstable and controllable) (Aponick & Dembo, 1983; Butkowsky & Willows, 1980). Bogie and Buckhalt (1987) found that "gifted" students differentiated themselves from "educable mentally retarded" (EMR) students in "task persistency".

> Gifted students seemed to differentiate themselves on the measure of task persistence. They continued to work at the

> difficult task an average of 34 seconds longer than did EMR students, with apparent great determination to complete the task with success. Also notable is that when variability in persistence time within each group is considered, the gifted group showed far less variability (Bogie & Buckhalt, 1987, p. 73).

Research has demonstrated that students who attribute failure to internal, stable and uncontrollable causes such as ability demonstrated lower motivation and displayed decrements in performance. Individuals who attribute failure to internal, stable and uncontrollable causes also tend to avoid tasks which can lead to failure; conversely, individuals who attributed failure to internal, unstable causes such as effort revealed higher task persistence (Hoffman & Weiner, 1978; Weiner, 1986; Zoeller, Mahoney & Weiner, 1983).

It is difficult to conceive how task persistence could be explained using only the uni-dimensional construct of locus of control. Even more difficult would be explaining the phenomenon of avoidance ("distance coping") in anticipation of a potential failure situation. Using a modified attributional model (Abramson, Seligman & Teasdale, 1978), Mikulincer (1989) found that the attribution for failure increased engagement in off-task cognitions, augmenting the use of emotion focused and distance coping. More specifically, when individuals failed they became distant and began to engage in thoughts other than the specified task.

> However, the most original set of findings was that a) distancing coping was the most important direct contributor to performance deficits following unsolvable problems, and b) distancing coping also acted as an intervening link between attribution and off-task cognitions, on the one hand, and performance, on the other (Mikulincer, 1989, p. 578).

This development indicated that there is a need to help individuals gain new ways to attribute the cause of their failure. If individuals continue distancing themselves mentally and physically they will begin to avoid situations which could lead to failure. The individuals' "moving away" linked to internal, stable (global) attributes, could lead to helplessness and unhealthy adapting skills (Horney, 1970).

In summary locus of control and causal attribution are not synonymous nor are the terms interchangeable. At least these attributes, locus, stability and controllability are seen to be included in the overall concept of causal attribution. In order to test for differences between so-called "normal" individuals and those labeled as having sustained a M/MTBI, free from observer bias, an instrument must be found which is capable of measuring all three attributes.

Matching Variables.

Following the review of the literature, variables such as gender, age and level of educational advancement have been shown to bear some relationship to an individual's causal attribution. Therefore, researchers need to match subjects for these variables. By matching the subjects the researcher can control for extraneous contaminators of causal attribution.

Different attributional styles were noted between males and females (Deaux, 1984; Frieze, Whitley, Hanusa, & McHugh, 1982; Weiner, 1986). In areas of achievement, women rated their abilities more negatively, had lower expectations, and would more likely attribute failure to ability when compared to males (Friezeet *al.*,, 1991). Deaux (1984) examined women's attribution related to stereotypical tasks where women are expected to have greater difficulties compared to men (*e.g.*, mechanical puzzles). Regardless of the task, gender could conceivably exert an influence on the causal attributions of both the experimental and control groups.

With the maturation of the individual comes increasing knowledge of life experiences. The individual is a scientist who continuously tries to understand the world (Weiner, 1993). Therefore, as individuals grow older they continue to experience situations which shape their style of attribution. Abilities and effort develop as well as the individual's concept of chance and control. Even the concepts of

helplessness, linked to attribution changes with age. Multiple experiences of failure take time. Over time the person realizes that the continued failure is due to an internal, stable and uncontrollable cause and helplessness develops. Individuals at 21 perceive themselves, others, and achievement differently than at the age of 42 (Weiner, 1986).

With age comes increases in education. It was noted that individuals who attained levels of higher education perceived failure as surmountable and necessary to achieve success (Valencia, 1994). As previously noted, internal and controllable causal attribution was considered to be a more adaptive way of attributing success and failure (Dummer *et al.*, 1987). This form of causal attribution was linked to such constructs as self-efficacy, self-esteem and self-regulation (Shunk, 1994). Students possessing internal and controllable causal attribution had enhanced motivation and educational success (Shunk, 1994; Valencia, 1994).

Summary and Basic Hypothesis

While considerable research appears to have been devoted to investigating the effects of causal attribution with populations identified as "mentally retarded," "physically disabled," or "learning-disabled", surprisingly little attributional research seems to have been directed toward those diagnosed as having sustained a M/MTBI. The

research suggests a plausible link between labeled disabilities and internal, stable, uncontrollable attributional causes It seems likely that such an attributional style would be characteristic of people who have sustained a M/MTBI. As previously mentioned, research confirming this relationship has not been carried out. The present study is designed to investigate this prediction. Thus, it is hypothesized that individuals who have a M/MTBI will be more likely than non-labeled persons to attribute failure to internal, stable and uncontrollable (both personally and externally) cause.

CHAPTER II

EXPERIMENTAL DESIGN

The design of this study was a comparative analysis of the causal attribution of students diagnosed as having sustained a M/MTBI with non-labeled counterparts. In this chapter the design and method of the study are presented. The discussion of the sample is followed by a description of the measurement instruments, the procedure used in the collection of the data, the procedures used to analyze the results, and the limitations of the research.

The Sample

To ensure that observed group differences would be based solely on the diagnosis of a M/MTBI, the control and experimental groups in the present study were matched on three variables: i) gender (male/female), ii) age (above 18), and iii) level of educational achievement (college and university). As previously mentioned in the literature review, the research results have been divided concerning the findings of significant differences in the area of age, gender, and educational level; however, this equivocation has apparently exerted sufficient influence to warrant incorporation into this investigation (Deaux, 1984; Frieze, Whitley, Hanusa, & McHugh, 1982; Shunk, 1994; Valencia, 1994; Weiner, 1986).

Experimental Group

Initial contact with the experimental group was through the counsellor and/or program coordinator of the "special student" section of colleges, universities, and community support programs in Eastern Ontario. A meeting outlining the proposed research was provided to the counsellors and program coordinators. Participating coordinators were given the criteria for applicable subjects and asked to contact any individuals meeting the set standard. Individuals had to have obtained student status at college or university; they had to have been diagnosed with a M/MTBI; and, they had to be over 18 years of age. Moreover, there should be an equitable distribution of males and females, if possible. Advertisements were also circulated in universities and colleges to request the participation of any students who had been diagnosed as having a M/MTBI. Advertisements contained the same criteria given to the program coordinators.

Subject participation was voluntary. The motivating factors for participation were reported by subjects and coordinators to be the importance of participating in research concerning M/MTBI, the possibility of improvements in the educational settings and a desire to share their history of being a student with a M/MTBI. Further information concerning the administration of the CDS and interview are listed in the "procedures for data collection".

The experimental group included 30 individuals (16 males and 14 females) between the ages of 21 and 54 years (Appendix A). All subjects were adult students which eliminated the need for obtaining consent from a legal guardian. The mean age of the sample was 28.00 years and the standard deviation was 7.46 years. Eighteen subjects had obtained student status at the college level while 12 were enrolled at the university level. These subjects had been diagnosed as having a M/MTBI. The predominant diagnostic tool used to classify the severity of a brain injury was the Glasgow Coma Scale (GCS) which is frequently administered by emergency physicians. A score between 8 and 15 on the GCS signifies a M/MTBI (Winogron, Knights & Bawden, 1984). If GCS scores were not available to the program coordinator the following criteria were used to determine eligibility for the study: hospitalization due to a brain injury; and, diagnosis of a M/MTBI by an attending emergency physician.

Control Group

Once subjects in the experimental group were identified, the selection of subjects for the control group began. The control subjects were selected using stratified randomization for age, gender and educational setting. The sample included 30 individuals (16 males and 14 females), who were over 18 years of age (Appendix A). The age of the control group ranged from 20 to 50 years. The mean age of the

control group was 28.30 years and the standard deviation was 7.55 years. This sample contained individuals matched with the experimental group for age, gender, level of education achieved (18 subjects from college, 12 from university) and subjects' academic concentration area. The last requirement for the control group was that none of the subjects had reported being diagnosed with a M/MTBI.

The matching of subjects in the experimental and control groups was difficult and time consuming. The educational setting, age and gender of each subject in the experimental group were recorded. If a subject from the experimental group studied in the area of general arts, at college and was twenty years of age the researcher went to a college (not necessarily the same) obtained the area where courses in general arts were housed and approached students requesting their participation in the study. Requests for participants occurred before class began or when students finished the class (depending on availability of students). If a close match was found, the researcher explained the following:

> I am from the University of Ottawa and I am conducting research concerning the causal attribution of students with M/MTBI. It will require only a maximum of ten minutes of your time to complete the questions and I was wondering if you would like to participate in the control group of non-M/MTBI

students. There is a possible interview; however, if you do not want to participate you don't have to.

Inquiries were made concerning the possibility of a M/MTBI, age and concentration area. The matches were not perfect; however, through extensive effort the samples were well matched (Appendix A). No compensation was given to subjects in the control group; however, the importance of the study for fellow students with M/MTBI was reinforced. Most of the control group thought the topic was interesting and participated due to what might be interpreted as "intrigue"; however, there appeared to be a lack of motivation to participate in the interview. Further information concerning the administration of the attributional scale and interview are described in the section on "procedures for the administration of testing instruments".

Measurement Instruments

Two measurement instruments were used to gather data from subjects in the experimental and control group. The first instrument was McAuley's CDSII. The CDSII was used to collect data on the dependent variable of causal attribution (internal, stable, personally controllable and externally controllable) reported by subjects when they placed themselves in a hypothetical situation of having failed an

examination. The CDSII was administered to both the experimental and control groups.

The second instrument was a semi-structured, open-ended interview conducted following the CDSII data collection. The purpose of the interview was to clarify the recorded data and to develop a clearer understanding of possible differences concerning causal attribution. The interviews were also used to obtain additional information about the injury and educational expectations of the students in the experimental group. The following is an example of how the interviewer encouraged clarification: "I noticed that you circled 9 on question 7 which means the cause of your failure was stable. Could you explain this response in more detail?"

The independent variable which was the diagnosis of M/MTBI was measured by the occurrence of the injury, consequent hospitalization and available scores from the GCS. In the following sections additional information on the measuring instruments is presented.

The Measurement of M/MTBI

For individuals to be included in the experimental group a diagnosis by a physician of a M/MTBI was required. The injury is labeled "mild" when there is less than twenty minutes of unconsciousness, and fewer than forty-eight hours of hospitalization,

and "moderate" when there is more than twenty minutes of unconsciousness, and a prolonged hospitalization.

Additional information concerning M/MTBI was obtained from the individual's scores on the GCS a diagnostic instrument frequently used by emergency physicians. The GCS scores are, in most cases, determined when patients are admitted to the Emergency Department and reflects their level of consciousness (Teasdale & Jennett, 1974). Full GCS scores (all three sub scores) are obtained when the patient has regained consciousness, as explained by Winogron *et al.*

> The GCS measures responsiveness in three areas: eye opening, best verbal, and best motor responses. In each of these areas, well-defined criteria are used to grade responsiveness, with a score of 14 points indicating normal consciousness and a score of 3 points indicating the most severe coma measurable on the scale (Winogron *et al.*, 1984, p. 273).

Trained raters allocating GCS scores independently for forty of fifty-one patients found an inter-rater agreement rate exceeding 90% (Winogron *et al.*, 1984).

> Also, comparable morbidity and mortality rates have been reported for patients with similar GCS scores in different centres. These findings indicate the validity of the GCS as a measure of

> injury severity. The popularity of the scale is increasing and its continued use will facilitate interstudy comparisons (Winogron *et al.*, 1984, p. 273).

The GCS can be used as an indicator of the severity of the injury. It is used to discriminate severe, moderate and mild brain injuries.

A diagnosis of a mild brain injury is made on the basis of a score of 13 to 15, a loss of consciousness (< 20 minutes), and a period of hospitalization no longer than 48 hours (Rimel, 1981). In Winogron *et al.* 's (1984) study patients with scores of 7 and above were assigned to the mild or moderate injury group while those who scored less than 7 were assigned to the severe group. For the purpose of this investigation, individuals who had scores ranging from 8 to 15 were considered as M/MTBI subjects. This classification encompassed students who had sustained moderate to mild brain injuries (Alves, Macciocchi & Barth, 1993; Dikment & Levin, 1993; Kay, 1993; Zasler, 1993).

Measurement of Causal Attribution

To overcome 'fundamental attribution error', the CDSII was developed to augment the original Causal Dimension Scale (CDS) (McAuley *et al.*, 1992). This revised scale was designed to clarify the relationship between control and locus which was neglected in the

original CDS, and to increase the alpha coefficient for the dimension of control. The CDSII is comprised of twelve Likert-type questions (three more than the CDS), where the respondents code the causal attribution along a series of different scales representing each of Weiner's three dimensions (Appendix B). Each of Weiner's dimensions (locus, stability and controllability) is measured by three questions; however, the dimension of control has three questions measuring external control and three questions measuring personal control. The differentiation between personal and external control complies with McAuley's theoretical evolution of Weiner's three dimensional model.

The internal consistency (reliability) of the four scales was calculated using coefficient alpha. Values ranged from .60 to .82 across the four studies: locus of causality, .67; stability, .67; personal control, .79; external control, .82 (McAuley *et al.*, 1992).

Personal conversations with McAuley (November 27, 1995) (Appendix C) assisted in understanding the validity of the CDSII. In terms of internal validity, McAuley *et al.* (1992) used the LISREL computer program to provide a chi-square test of the overall goodness-of-fit of the CDSII model. "[The chi-square was used to clarify whether or not the CDSII] model is able to account for relations among the manifest or measure variables" (McAuley *et al.*, 1992, p.570). The results were obtained by McAuley and his associates. They used four combined samples (N= 380) in their study because of the sample size

sensitivity of the LISERAL chi square. The CDSII provided an adequate fit for the data: "$X^2(48, N = 380) = 96.85, p < .001, GFI = .958.$)" (McAuley *et al.*, 1992, p.570). Information on concurrent validity was not available due to the lack of comparable instruments measuring Weiner's three dimensions of causal attribution. During the personal interview, McAuley mentioned that the CDSII is a revision of the original CDS developed by Russell (1982). Russell developed the CDS with the assistance of Weiner who believed that the instrument measured his theory of attribution (Appendix C). This information is supportive of the suggested strong face validity of the scale.

Personal Interviews

As mentioned in the beginning of this section, a semi-structured, open-ended interview was conducted following the CDSII data collection. Interviews were completed with all subjects (30) in the experimental group and 8 subjects in the control group. The difference in the number of interviews completed was due to two reasons. First, participants in the experimental group seemed to need time to discuss their injury, and explain the reasons for their responses on the CDSII. They wanted to clarify their interpretation of failure and how they attempted to cope with their injury. Subjects in the experimental group appreciated the opportunity to discuss their continued frustration with failure and to explain the emotional component of the

M/MTBI. The need to share more information was not as evident for subjects in the control group, probably because they had not experienced an injury.

The second reason for the discrepancy in the number of individuals interviewed was due to time constraints. It was difficult for students in the control group to extend their participation to an interview. At the time of the study students were beginning their examinations and reported that they did not have adequate time for interviews. The minimum number of interviews, as identified in the thesis proposal, were completed with the control group. The matching of the control group with the experimental group was given priority; however; all of the information obtained will be helpful in illustrating the similarities and differences between the groups

The purpose of the interviews was to clarify the recorded data and to develop a deeper understanding of possible differences concerning the subjects' causal attribution (Morawski & Brunhuber, 1993, 1995). The interviews also allowed for additional information concerning the students' injury and their educational setting. Interviews were structured on the basis of the responses obtained from the CDSII, in order to clarify the answers.

> Interviewing (i.e., the careful asking of relevant questions) is an important way for a researcher to check the accuracy of - to verify or refute - the impressions he or she has gained through

> observation [...] The purpose of interviewing people is to find out what is on their mind - what they think or how they feel about something... Structured and semistructured interviews are best conducted toward the end of a study, however, rather than at the beginning as they tend to shape responses to the researcher's perceptions of how things are. They are most useful for obtaining information to test a specific hypothesis that the researcher has in mind (Fraenkel & Wallen, 1993, p. 385).

Personal conversations provided additional insight into students' injuries and their perceptions of failure which affect their present and future attribution.

Procedures for Data Collection

Due to the nature of this investigation, a quasi-experimental design was employed in order to minimize the intrusiveness of the study and because the researcher had no control over assignment of subjects to the control and experimental groups. In other words, the researcher had no control over what subject received a M/MTBI.

> There are many natural social settings in which the research person can introduce something like experimental design into his/her scheduling of data collection procedures (*e.g.*, the 'when'

> and 'to whom' of measurement) even though he/she lacks full control over the scheduling of experimental stimuli (the when and to whom of exposure and the ability to randomize exposures) which makes a true experiment possible. Collectively, such situations can be regarded as quasi-experimental designs (Campbell & Stanley, 1966, p. 34).

The control group contained subjects who had never been diagnosed as having sustained a M/MTBI. This group selected by stratified random sample, from college and undergraduate university students, was matched to the M/MTBI group for age, gender, educational setting and academic concentration.

As previously mentioned, students who had sustained a M/MTBI were notified of the research by the counsellor and/or program coordinator of the "special student" section of colleges, universities, and community support programs in Eastern Ontario. The counsellors and program coordinators contacted the researcher with the names of students wanting to participate in the study. Contact was made in person, or over the telephone, depending on what the subject preferred. The subjects were given a brief explanation of causal attribution and the format of the data collection, which included the CDSII and possible interview. They were than asked to sign a consent form (with the researcher or onsight counsellor) and continue with the CDSII. The CDSII was administered according to the following format.

1. Prospective subjects were asked to sign the consent form giving permission to continue with collection of data.

2. The procedure was explained to all subjects. There were then asked to read the fictitious story of an individual experiencing failure in an achievement situation.

3. Subjects were requested to place themselves in the hypothetical position of experiencing the failure and then write/describe an explanation of the failure.

4. After they completed the explanation, subjects were asked to read and/or listen to the questions and to answer all of them.

5. All subjects were asked to participate in a short interview lasting less than thirty minutes. Questions were used to clarify responses and debrief the individual in situations of increased stress or frustration.

A hypothetical situation of failure was used in the CDSII rather than asking the student to recall an actual situation of failure. According to Russell (1982) placing an individual in a hypothetical situation lessens the emotional distress. The scenario was as follows:

You have just failed a final exam which was very important to you. The failure of the exam was due to...

The hypothetical scenario was adapted from Russell's (1982) scenario with the original Causal Dimension Scale. The data from the CDSII was recorded and prepared for statistical analysis.

Procedure for Data Analysis

The data obtained through the CDSII were analyzed using the "SPSS" computer program. Considering the possible inter-dependency of the subcategories of locus, stability, external, and personal control, a multivariate analysis of variance (MANOVA)(Fraenkel & Wallen, 1993) followed by a univariate post hoc test was used to analyze the data. The interview data were obtained through field notes taken during the conversations. The data were used to clarify the responses of the subjects in regard to their causal attributions following the administrations of the CDSII.

Limitations of the Research

There were limitations evident in this study due to the sampling parameters as well as the research design. An interview with all of the participants in the control group as well as a larger sample size would have provided a more comprehensive data base. The use of a

hypothetical scenario with the CDSII does not elicit the same impact or cognitive response as does an actual situation where failure occurs. The CDSII does not take into consideration the affective content or the context in which individuals form their causal attribution. It would be beneficial if the researcher was able to understand how significant others, specific courses and specific settings effect the student's attributional style.

The generalizability of this study can be extended only to those adults who have sustained a M/MTBI and who are students at college or university. The results cannot be generalized to individuals reporting a head injury unless they were diagnosed by a physician or to individuals diagnosed with severe brain injuries. As new instruments are refined, and subcategories expanded more refined observations can be made in the future.

CHAPTER III

PRESENTATION OF THE RESULTS

This section of the study contains the descriptive analysis and the results of the inferential analysis. The chapter is organized under the following headings: i) review of the research hypothesis; ii) descriptive analysis of data; and, iii) the results of the inferential analysis.

Review of the Research Hypothesis

The question that guided the study was: *Is there a difference between the causal attributional style of students who have been diagnosed as having sustained a M/MTBI and those who have not sustained a M/MTBI?* It was predicted that individuals who have been diagnosed with a M/MTBI will attribute failure to a more internal, stable and uncontrollable cause.

Descriptive Analysis of Data

The combined sample consisted of 60 individuals between the ages of 20 and 54, with a mean age of 28.15 years and a standard deviation of 7.44. There were 32 males and 28 females. Thirty-six subjects had obtained student status at the college level while 24 were at the university level. The experimental group consisted of 16 males and 14 females. As noted in the previous chapter, the mean age of the

experimental group was 28.00 years with a standard deviation of 7.46 years. Eighteen subjects had obtained student status at the college level while 12 were enrolled at the university level. Through extensive attempts at matching, the control group had the same number of males and females as did the experimental group. The educational level of the subjects in the control group were the same as for the experimental group. Even though matching was conducted for age, there were obvious differences between groups. The average age of the control group was 28.30 years with a standard deviation of 7.55 years.

A comparison of scores on the CDSII, achieved by each group, indicated that there were identifiable differences between the means on three of the four variables. The differences are summarized in Table 2.

Table 2

Mean and Standard Deviation for the Experimental and Control Groups on the CDSII.

Group	Variable	Mean	Standard Deviation
	Locus		
Exp.		22.83	2.90
Cont.		20.57	3.92
	Pers. Cont.		
Exp.		12.77	4.85
Cont.		22.60	3.46
	Ext. Cont.		
Exp.		8.43	3.92
Cont.		9.00	3.68
	Stability		
Exp.		20.13	4.27
Cont.		8.67	3.11

Note. The higher the score the more internal, stable, personally and externally controllable. Scores were obtained from CDSII results

The score on the CDSII indicates where the individual's causal attribution resides on each of the four variable continuums.

Correlation of The Variables.

As mentioned in the literature review, McAuley *et al.* (1992) found a correlation between the variables of locus, stability, personal control and external control. These correlations are illustrated in Table 1. Correlation of the variables were ascertained following the results of the CDSII with the experimental and control group. The results for the control group were generally lower yet similar to the results found by McAuley *et al.*. Table 3 illustrates the correlations found for the control group.

Table 3
Correlations Among the Factors for the Control Group.

	Locus of Causality	Stability	Personal Control
Stability	-.143		
Personal Control	.559*	-.250	
External Control	-.172	.220	-.412*

*p<.05

One difference was the correlation of locus and stability. McAuley *et al.* found no correlation; however, the relationship between locus and stability for the control group was slightly negatively correlated.

The results of the correlations for the experimental group were lower than the results found by McAuley *et al.* (1992). Definite differences were evident in the correlation of stability and external control as well as personal control and external control. The results are illustrated in Table 4.

Table 4
Correlations Among the Factors for the Experimental Group.

	Locus of Causality	Stability	Personal Control
Stability	-.043		
Personal Control	.191	-.698*	
External Control	-.357	-.452*	.420*

p<.05

These differences will be discussed in more detail in Chapter IV.

On the basis of the descriptive analysis of the data, it would appear that the experimental group attributed failure to a more internal, stable, personally and externally uncontrollable cause. Further analysis of the data was needed in order to determine if these differences were significant.

The Results of the Inferential Analysis

Prior to conducting the inferential analysis of the data, a test was done to ascertain the univariate homogeneity of variance (Cochrans and Barlett-Box). The F value for this analysis was found to be greater

than .05 for the four variables. In view of this non-significant ratio, the analysis proceeded.

The research hypothesis was tested in the null form by means of a MANOVA, as described in Chapter II. A post hoc univariate analysis of the data was performed to identify where the significant differences were located. The level of significance was set at $p < .05$.

Table 5
Multivariate Tests of Significance and Univariate F-tests.

MANOVA	Value	Exact F	Hyp. DF	Error DF		Sig. of F
Pillais	.752	41.600	4.00	55.00		.000*
Hotellings	3.025	41.600	4.00	55.00		.000*
Wilks	.248	41.600	4.00	55.00		.000*
Univariate F-test	Hyp. SS	Error SS	Hyp. MS	Error MS	F	Sig. of F
Locus	77.067	689.533	77.067	11.889	6.482	.014*
Pers. Cont.	1170.417	1030.567	1170.417	17.768	65.871	.000*
Ext. Cont.	4.817	837.367	4.817	14.437	.334	.566
Stability	1972.267	810.133	1972.267	13.968	141.201	.000*

Note. Scores were obtained from the CDSII results
*$p < .05$

In Table 5 significant differences are illustrated between groups following the MANOVA. The univariate analysis identified significant differences between groups in locus, stability and personal control; however, there was not a significant difference between groups concerning the variable of external control.

Data were also obtained through a semi-structured, open-ended interview which was conducted following the administration of the CDSII. Interviews were conducted with all members of the

experimental group and eight subjects of the control group. To summarize the results of the interviews, quotations from field notes for each of the four dimensions of causal attribution are included. In each section the first quotation is from the experimental group and the second quotation is from the control group. Each quotation reflects the essence of the replies received during the interviews.

Locus of The Causal Attribution

The subjects were asked to clarify their responses concerning the locus of their failure. A frequently reported response by members of the experimental group was:

> The injury is the reason for my failure. Is it internal? You're darn right it is; that seems to be a silly question. It is inside me, in my head. If I get rest or use my planner I can get some good results, but if I forget my planner my day is shot.

A frequently reported response by members of the control group was:

> If I experience failure, it's due to me not studying. I have control over that; but sometimes I can be talked into doing something other than studying.

Stability of The Causal Attribution

The stability of the individual's causal attribution was significantly different between experimental and control groups. The following response from the experimental group illustrated the high degree of stability in regard to their cause of failure.

> I am not able to retain as much information as I was once able to do. I am succeeding at school; however, I need to use devices I never had to before. I used to intentionally leave my planner or tape machine at home because I hated using them. It took a long time before I wanted to realize that I will always need these aids to avoid failure and succeed.

The majority of subjects in the control group viewed their failure as a temporary situation which they could, if desired, change. With enough effort the stability became a non-issue for many of the students in the control group. An example of a response from the control group was:

> I may fail at something but it is usually because I don't study enough for the exam or the professor. I know that if I try hard enough to study the next time I can do as well as I want to do

Personal Control of The Causal Attribution

The significant difference between the experimental and control group concerning personal control was evident in the responses during the personal interview. The experimental group had a very low sense of personal control over failure as illustrated in the following quote.

> First thought: I recognize that I failed because I have a brain injury. The failure is due to my poor memory, poor concentration, fatigue, etc. Second thought: I know I would have passed if I was not brain injured. I know I did my best but I still failed, which is frustrating. Conclusion: It depends on how I look at it. In some ways I can have some control but if I think of the big picture I seem to lose that control.

The control group had a greater sense of personal control over their situation of failure. The following quote illustrated their sense of optimism towards overcoming their failure and their drive to do better in the future.

> If I experience a failure it means that I pay more attention in class. I try to see the professor, and do everything I reasonably can to succeed in the future.

External Control of The Causal Attribution

There were no observable difference statistically between the two groups for external control. This lack of external control was apparent in their attempt to clarify their responses to the questions. An example that students in the experimental group gave for their low mean scores concerning external control was:

> I do not feel that I have control over my failures; it is as if I lose my thoughts and blank out. There is not much I can do about this and professors suggestions do not help either.

An example to illustrate a typical response given by students in the control group was:

> I have control over my situation and no one else can make me do something I don't want to do. If I go out the night before a test it is my fault I could have said no if I wanted to. If I mess up its due to me.

In summary, there were interesting differences between the dimension correlations of the experimental group and the dimension correlations given by McAuley *et al.* The results of the study indicated that there were significant differences between the experimental and control groups for the dimensions: locus, stability and personal control.

The experimental group scored significantly higher in locus and stability and scored significantly lower in personal control. The data from the personal interviews supported and clarified the results of the CDSII.

CHAPTER IV
DISCUSSION OF THE RESULTS

Data was obtained from both the experimental and control group concerning their causal attribution following a failure situation. The results were discussed according to five areas of interest: i) locus of the cause of failure; ii) stability of the cause of failure; iii) personal control of the cause of failure; iv) external control of the cause of failure; and, v) additional findings. Topics such as correlations, support programs and peer influence are incorporated into the section on additional findings.

Locus of The Cause of Failure

A univariate analysis of the locus variable of the subjects' causal attributions verified it to be significantly different between the two groups as originally hypothesized. The subjects in the experimental group perceived the reasons for their failure as internal to themselves and provided a higher mean score on the CDSII for this variable, when compared with the control group.

The significant difference between the groups was not strikingly evident in the interviews following the completion of the CDSII. The experimental group and the control group provided similar responses concerning the issue of control during the interviews; however, there

was a difference in the affective content of the responses. The possibility of failure being interpreted as more internal, considering the stability and uncontrollability of the attribution, warrants consideration (McAuley *et al.*, 1993).

> As would be expected, perceiving the cause as personally controllable was positively related to the locus of causality dimension...Personal control was [also] associated with perceiving the cause as unstable (McAuley *et al.*, 1992, p. 569-570).

Individuals in the experimental group viewed their failure as stable and uncontrollable and invested more emotion into the response which caused them to be more self-critical. This self-criticism, helplessness and in some cases embarrassment probably exerted an effect on the extent to which they attributed the cause of failure as internal. McAuley *et al.* (1993) found that internal attribution of failure correlated with feelings of guilt, shame, incompetence, and embarrassment. As reported during the interviews, the experimental group seemed to be more emotionally sensitive about their failure situation in comparison to subjects from the control group. Weiner discussed the issue of emotions as follows:

> In addition, the stability of a causal ascription, by influencing expectancy of success and failure, generates emotions such as

> hope and hopelessness. Hence a failure ascribed to bad luck or lack of effort, both unstable causal attributions, will give rise to the belief that success can be attained in the future, whereas a failure attributed to, for example, lack of aptitude will result in a low expectancy of future success and hopelessness (Weiner, 1992, p. 310).

There appears to be a need to address the emotions of students who have sustained a M/MTBI.

> Increases in emotional symptoms, especially depression, at 6 months post injury may be related to reactions to injury and any accompanying difficulties encountered in the attempt to resume functioning...There is an expectation, from themselves and others that they will return to work or school and the multitude of daily activities without difficulty...When individuals are unable to function as expected, they experience repeated failure and frustration that may lead to feelings of anger, helplessness and depression (Cicerone, 1991,p. 36).

This identifies an obvious need for providing support in both the schools and community. The emotional disillusionment needs to be addressed for future success to transpire (McAuley *et al.*, 1993).

There does not seem to be a similar investment of emotions concerning the locus of the failure for the control group. This was supported by the data obtained from the interviews and was illustrated in the presentation of the results concerning locus of causality. The control group did not share the sense of stability and lack of controllability that the experimental group demonstrated. There was a sense that failure was temporary and with effort success was obtainable.

Stability of The Cause of Failure

The stability of the cause of failure was significantly different between the experimental and control groups. As previously mentioned, the stability of the cause of failure is a major determiner of the stress and emotional difficulty experienced by the students involved (Abramson *et al.*, 1978; Weiner, 1992).

The responses of subjects, in the experimental group, to questions involving the stability of their injury were intriguing. The students who viewed their failure as being due to their injury reported that their injury was relatively stable. That is, their injury was something permanent in their life. This was reported to be one of the more difficult realizations for these students. Many students in the experimental group mentioned that it took a long period of time to acknowledge the fact that they may not be able to retain and remember as much information as they once were able to do. The physical,

cognitive and behavioral deficits following the injury made it more difficult for the students to process as much information as they had before their injury. Subjects in the experimental group reported that the effort needed to process information caused fatigue which increased their difficulties in the classroom.

The effort needed to change one's situation of failure was an area where the two groups differed. As mentioned earlier, students in the control group reported the need for more effort in order to process information to succeed; however, if effort was increased, fatigue would set in and failure would occur due to fatigue instead of the lack of information. The physical and cognitive deficits of a M/MTBI demonstrate the overwhelming effect this injury can have on individuals' stamina and information processing.

> [Evidence of a mild M/MTBI]: Physical symptoms of brain injury (eg, nausea, vomiting, dizziness, headache, blurred vision, sleep disturbance, quickness to fatigue, lethargy, or other sensory loss) that cannot be accounted for by peripheral injury or other causes; Cognitive deficits (eg, involving attention, concentration, perception, memory, speech/language, or executive functions) that cannot be completely accounted for by emotional state or other causes; and behavior changes and/or alterations in degree of emotional responsivity (eg, irritability, quickness to anger, disinhibition, or emotional lability) that

cannot be accounted for by a psychological reaction to physical or emotional stress or other causes (Mild Traumatic Brain Injury Committee of the Head Injury Interdisciplinary Special Interest Group of the American Congress of Rehabilitation Medicine, 1993, p. 87).

The majority of subjects in the control group viewed their failure as a temporary situation which they could change if they desired. With enough effort the dimension of stability was a non-issue for many of the students in the control group. Some of the students in the control group reported their lack of studying as being relatively constant (stable); however, they also admitted that their failure could have been avoided with proper attention.

Personal Control of The Cause of Failure

During the interviews it was evident that many of the students, in the experimental group, believed that they had some minimal control over aspects of their everyday education. They could get a good night's sleep and use repetitive tools such as tape recorders or note organizers to help their studies; however, it was when the students experienced failure and examined the total effect of the injury on their future, the totality of their predicament, that they felt helpless. As

students gained a greater awareness of their full situation they appeared to become more distressed (Slater, 1989).

In general the feedback from the experimental group complemented the theory of helplessness and depression being possible products of attributing failure to internal, stable, personally and externally uncontrollable causes (McAuley, 1993: Weiner, 1986 & 1992).

> A pattern of decreased self-confidence and poor self-esteem may predispose persons to development of low efficacy expectations. Elevated prior expectations of functioning, perhaps especially expectations for superior intellectual achievement through which the patients defined themselves, are likely to lead to significant subjective distress over reduced cognitive functioning (Cicerone, 1991, p. 40)

McAuley *et al.* (1993) found that individuals who attributed failure to personally uncontrollable causes felt outrage and helplessness.

The control group recounted that they exerted a relatively constant control over their failure situation. The subjects in the control group tended to report that they knew how much they needed to do to accomplish a successful result and failure was due to their own lack of preparation. They reported sensing that if a failure transpired the individual's continued persistence would eventually lead

to success (Weiner, 1992). This result complements Bogie *et al.*, (1987) who observed that gifted students, compared with educable mentally retarded students, seemed to differentiate themselves by continued persistence in failure situations. The feelings of helplessness and depression were not as identifiable with the control group who reported feeling exasperated and angry over their brief setback (McAuley, 1993).

The differences between the experimental and control groups concerning control were not limited to personal control. Even though there were no significant differences between groups regarding external control, the reasons for the low scores were interesting.

External Control for The Cause of Failure

McCauley *et. al.* (1992) divided control into two variables: personal and external control. Individuals in the experimental group, who attributed a failure to a completely uncontrollable cause, tended to feel that no one, including others, would have any ability to change their failure situation. Individuals in the control group reported a high degree of personal control (low external control) over their situation of failure. The control group reported that they had the ability to overcome and govern failure. Similar to stability, there were significant differences between the experimental and control groups concerning personal control. These significant differences were not found for external control.

The two groups produced low mean scores for external control. These findings were evident for apparently different reasons, which were identified through the groups' responses and the personal interview. The majority of the control group responded that they were the ones with control over their situations and, regardless of others, they were able to change their situation. The majority of the experimental group expressed the view that no one, personal or external, exerted control over the situation which, as has been theorized, increases the feeling of helplessness (Weiner, 1980c & 1992). The similarity in scores for external control is not necessarily surprising. McAuley (1993) mentioned that depending on the circumstance, one area of controllability (personal or external) is more disposed to be implicated in the cause.

> The argument was made earlier that collapsing control by respondent and control by other individuals into one dimension assessing 'control by anyone,' as many researchers have done, blurs the conceptual distinctiveness of the two aspects of control. Moreover, depending on the circumstances of the outcome in question, it is quite likely that one rather than the other dimension of control will be implicated in causal search. Individuals appear to be more generally disposed to make attributions that speak to personal controllability-

uncontrollability, especially in achievement settings (McAuley *et al.*, 1993, p. 483-484).

Outside of the four dimensions of causal attribution there were other findings which were of importance. In the next section there will be a discussion of the results concerning additional findings.

Additional Findings

There was a positive correlation between personal control and external control with the experimental group while the control group demonstrated a negative correlation. The control group's correlation concerning the dimensions of personal and external control were consistent with the findings of McAuley *et al.* (1992). Generally, for members of the control group there appeared to be a trade-off between personal and external control. As personal control increased, external control decreased.

As external control increased so did personal control for the subjects in the experimental group. These correlations are supported by the interviews conducted with the experimental group. It was reported by subjects in the experimental group that they began to feel that they could take control over their situation when support groups and counsellors were able to help them; however, individuals reported feeling helpless if counsellors could not help them during times of

failure. This finding supports the other correlation which can be traced to the experimental group's negative correlation concerning stability and external control.

This negative correlation between the dimensions of stability and external control was another area in which the experimental group differed from the control group. The negative correlation of stability and external control for the experimental group differed from the "normal" positive correlation found by McAuley when he developed the CDSII.

These results play an important role in regard to community and educational support programs for "special students". Hopefully support groups and counselling (external control) can be slowly decreased without personal control diminishing for those who have experienced a M/MTBI. Individuals with positive support programs reported feeling more worthwhile and had enjoyed better experiences; however, this positive view seemed to be fragile and easily susceptible to negative influences such as the lack of acceptance and understanding from peers and instructors. Green-Emrich and Altmaier (1991) felt that counselling played an integral role in developing an individual's control.

> These results [counselling benefits] may be useful in a psychoeducational context. For example, it may be useful to include attributional retraining methods in structured group

> situations in which cognitive interventions are stressed as ways of coping more adaptively with various life situations, such as adjustment to college life (Green-Emrich *et al.*, 1991, p. 354).

In support of the results concerning the positive relationship between personal and external control, as well as the negative correlation of stability and external control, it appears that peers and educational instructors could increase the individual's feelings of helplessness and depression. If instructors and peers relay a negative view of the student with a M/MTBI they can decrease students' sense of personal control and increase the perception of their injury as being a constant detriment. Peers and educators, such as teachers and counsellors, play an important role in the individual's recovery. If individuals believe that they cannot succeed at a task they will leave the setting which induces these feelings of incompetence (Abramson, Seligman & Taesdale, 1978; Mikulincer, 1989).

These issues concerning peer support and influence did not seem to be as strong a topic with the control group. Many students recollected that some of their reasons for failure were due to paying too much attention to social issues rather than to school; however, when it was time to make a definite answer on the CDSII the control group felt that they had the ultimate control over their academic grades.

The subjects in both the experimental and control groups were very helpful and supportive during the data collection. The students

in the experimental group were very knowledgeable concerning their injury and the support which would help them in their quest for continuing their education. The students' warmth and openness concerning not only their education, but also their injury and the road they have traveled was exceptional. It has given weight to the knowledge that support programs should pay heed to ensuring these students an equal opportunity to enjoy and succeed in their educational pursuits.

Significant differences were found between the control and experimental group concerning locus, stability and personal control. The students' brain injury played a predominant role in their attribution of cause following a failure situation. Material from the interviews was informative in regard to the emotional investment of the experimental group to a failure situation. The correlations of external and personal control as well as stability and external control were also of interest. The positive correlation between personal and external control and the negative correlation between stability and external control for the experimental group could influence rehabilitation. The positive influence of external control enhances the development of personal control; however, it needs to be seen whether external support can be decreased without students compromising their sense of personal control.

SUMMARY AND CONCLUSION

This study was designed to remedy four grievances outlined with the literature. These grievances were outlined as follows: i) difficulties in reaching consensus as to the causality of cognitive deficits following the occurrence of a M/MTBI; ii) an apparent lack of research concerning causal attributions of subjects diagnosed with a M/MTBI, while other diagnoses such as cerebral palsy, dyslexia, and attention deficit have been subjected to considerable attributional research; iii) researchers and "significant others" (family, friends, teachers..) who interpret the causal attribution of individuals without understanding the subjects' interpretation of their own causal personal attribution; and, iv) synonymous and interchangeable use of the terms causal attribution and locus of control. In this section these four "grievances with the research" are examined.

To review these four grievances, first, in this research it was demonstrated that there existed strong support for the actuality of psychological effects which may influence cognitive deficits following a M/MTBI; the injury may not account for the totality of the cognitive deficit. Second, a review of investigations into the role of causal attribution with related labels revealed that causal attribution could be applied to the diagnosis of M/MTBI. Third, utilizing the CDSII as a measure of causal attribution eliminated the fundamental attributional error by allowing subjects to interpret their own causal attribution.

Fourth, because causal attribution was used as the dependent variable in this study, the distinction between causal attribution and locus of control was clearly maintained.

The study was a comparative analysis of the causal attributions of students who have, and have not, sustained a M/MTBI. The theoretical rationale of this study was derived from the work of Weiner and McAuley. Past research suggested a plausible link between labeled disabilities and internal, stable, uncontrollable attributional causes. It seemed likely that such an attributional style would be characteristic of people who have sustained a M/MTBI. This attributional style was confirmed in the present study. To accomplish this, thirty college and university students with a M/MTBI and thirty students who had not been diagnosed with a M/MTBI were randomly selected. These sixty individuals were administered the CDSII which was developed by McAuley. The twelve question scale (four questions for each variable) assessed the locus, stability, personal control and external control of the individuals' causal attribution.

Implications

The results concerning the significant difference between the experimental and control group should encourage counsellors and other psycho-educational professionals to be cognizant of the particular attributional characteristics of students with M/MTBIs. The findings

contribute to a better understanding of the causal attributions of individuals who are currently learning new ways to cope with their injury as well as adjusting to a new way of life. The key is that any form of educational retraining or schooling could be more difficult following a traumatic event which elicits feelings of helplessness.

The results will be important for educational settings which, as seen in the literature review, may condone failure by individuals who have sustained a M/MTBI (Abramson, Seligman and Taesdale, 1978; Elam and Sigelman, 1983; Weisz, 1981). There is a need on the part of students with a M/MTBI to be accepted and appreciated by not only their peers but also their instructors. As previously mentioned, external controlling factors such as significant others play a role in regard to the student's personal control. If individuals believe that they cannot succeed at any achievement situation they will abandon the setting which causes these feelings of incompetence (Abramson, Seligman and Taesdale, 1978; Mikulincer, 1989).

Educational professionals need to understand that their role, and the role of the support programs, exert an influence on the students' sense of personal control. If empowerment is properly instilled in the student, personal control should increase. It remains to be seen whether this sense of personal control will continue following the termination of support after schooling ends.

The role of the psycho-educational professional can be one which takes note of these results and arrests the cycle of helplessness in

regard to achievement and emotional difficulties (Bordieri and Kilbury, 1991). Within rehabilitation there needs to be particular attention paid to the emotional issues of students with a M/MTBI. The students undergo a personality metamorphosis which can bring about confusion, frustration, and helplessness (Slater, 1989). In addition to the confusion of a change in aspects of personality, students must deal with the additional strain of increased effort to accomplish tasks which were at one time easy. With the increase in effort comes a lack of understanding from peers and instructors which continues to deflate an already fragile self-esteem and sense of control. Having an understanding of the emotional aspects of M/MTBI counselling and support programs should prove to be effective in enhancing the cognitive as well as the emotional variables during the student's recovery (Cicerone, 1991).

Finally, this research will broaden the domain of causal attribution and fill a gap where there is currently no attributional research. The CDSII has now been tested with a previously unrecognized sample of individuals with a M/MTBI. Through the completion of this study other researchers will be able to replicate and to expand future exploration in the area of causal attribution with M/MTBI.

This study indicates that further research is needed concerning students with a M/MTBI and the way their causal attributions interact

with their continued interest in education. Suggestions for further research are as follows:

1. Counselling strategies should be developed to examine the emotional turmoil which accompanies a student's M/MTBI.

2. As part of a larger study, the interaction of personal control and external control should be investigated concerning students with a M/MTBI.

3. Longitudinal case-studies should be conducted to derive a more in-depth understanding of the intricacies of M/MTBI and a student's education.

4. Additional research and interviews should be conducted with the view to developing further the assessment procedure, CDSII (McAuley *et al.*, 1992).

5. Additional research should be conducted in order to understand support programs or educational counselling which can shift the students' causal attribution to avoid helplessness and sustain their enjoyment of their educational experience.

The next step is to integrate the results of the research into the educational setting. As noted it is important for counsellors, instructors and peers to develop a better understanding and acceptance of students who have been diagnosed not only with a M/MTBI but any other diagnosis involving a limitation. With a better understanding comes acceptance and the opportunity for true unfettered learning and success.

> ....Realize clearly that every time they threaten someone or humiliate or hurt unnecessarily or dominate or reject another human being, they become forces for the creation of psychopathology, even if these be small forces. Let them recognize that every [individual] who is kind, helpful, decent, psychologically democratic, affectionate, and warm, is a psychotherapeutic force even though a small one (Maslow, 1970).

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APPENDIX A

Data From the Control and Experimental Group

Subject	Gender	Age	Ed. Setting	Area of Study	Handed	Locus	Stab.	Per. Cont.	Ext.Cont.
Matched Subjects 1									
Exp	Male	32	College	Engineering Tech	Right	23	25	8	3
Cont	Male	36	College	Engineering Tech	Right	18	6	21	9
Matched Subjects 2									
Exp	Male	28	College	Open (No Maj.)	Right	24	25	5	3
Cont	Male	31	College	Transf. out of Maj	Right	26	4	26	3
Matched Subjects 3									
Exp	Female	28	College	General Arts	Right	25	23	6	4
Cont	Female	32	College	General Arts	Right	24	9	22	9
Matched Subjects 4									
Exp	Male	23	University	Engineering	Right	24	20	9	11
Cont	Male	22	University	Engineering	Right	21	6	25	6
Matched Subjects 5									
Exp	Female	23	University	Arts	Right	26	20	17	3
Cont	Female	24	University	Arts	Right	23	9	27	5
Matched Subjects 6									
Exp	Female	21	University	Arts	Right	27	19	13	3
Cont	Female	23	University	Arts	Right	25	3	26	5
Matched Subjects 7									
Exp	Male	22	College	College Prep.	Right	23	21	13	7
Cont	Male	21	College	Voc. Training	Right	18	7	19	8
Matched Subjects 8									
Exp	Male	34	College	Cook Training	Left	20	24	9	6
Cont	Male	30	College	Cook Training	Right	20	6	23	5
Matched Subjects 9									
Exp	Female	25	University	Arts/Psy	Right	23	12	21	15
Cont	Female	22	University	Soc. Sci/Psy	Right	18	11	26	16

Matched Subjects 10									
Exp	Male	32	College	Off. Man. (Transf.)	Right	24	25	8	13
Cont	Male	36	College	College Prep.	Left	16	10	14	13
Matched Subjects 11									
Exp	Female	54	College	Open (No. Maj.)	Right	20	26	5	6
Cont	Female	>50	College	Open/College Prep.	Right	18	9	20	11
Matched Subjects 12									
Exp	Female	34	University	Arts/Psy	Right	21	14	17	7
Cont	Female	33	University	Arts/Psy	Right	15	10	17	9
Matched Subjects 13									
Exp	Male	38	College	College. Prep.	Right	17	20	15	15
Cont	Male	30	College	College. Prep.	Right	25	9	21	15
Matched Subjects 14									
Exp	Male	27	College	Business. Admin.	Right	25	9	20	11
Cont	Male	26	College	Bus. Ad./Comp. Prog.	Right	24	13	26	3
Matched Subjects 15									
Exp	Male	32	College	Open (No. Maj.)	Right	23	18	16	5
Cont	Male	31	College	College Prep.	Right	10	11	17	13
Matched Subjects 16									
Exp	Male	22	College	Voc/College Prep.	Left	23	25	15	5
Cont	Male	20	College	College Prep.	Right	12	7	24	5
Matched Subjects 17									
Exp	Female	29	College	Off. Admin	Right	23	19	16	9
Cont	Female	33	College	Off. Admin	Left	24	14	25	10
Matched Subjects 18									
Exp	Female	21	University	Arts	Right	21	13	18	14
Cont	Female	22	University	Arts/Psy	Right	21	4	27	7
Matched Subjects 19									
Exp	Male	23	University	Arts/Psy	Right	27	17	19	7

Cont	Male	22	University	Arts/Psy	Right	25	5	25	7
Matched Subjects 20									
Exp	Male	39	College	Open/Comp.	Right	24	21	18	13
Cont	Male	38	College	College Prep./Comp.	Right	20	11	15	13
Matched Subjects 21									
Exp	Female	27	College	Market/Eco.	Right	24	23	10	5
Cont	Female	24	College	Market/Acct.	Right	24	6	23	15
Matched Subjects 22									
Exp	Male	23	College	General Arts	Left	23	18	17	10
Cont	Male	24	College	General Arts	Right	22	9	24	10
Matched Subjects 23									
Exp	Female	21	University	Arts	Right	26	17	17	10
Cont	Female	21	University	Soc. Sci/Arts	Right	19	13	24	10
Matched Subjects 24									
Exp	Male	28	College	Health Cons.	Right	22	19	18	14
Cont	Male	28	College	Health Science	Right	24	12	25	10
Matched Subjects 25									
Exp	Male	24	College	General Arts	Right	21	22	17	5
Cont	Male	22	College	General Arts	Right	18	7	22	10
Matched Subjects 26									
Exp	Female	30	College	Job Coach	Right	20	18	18	12
Cont	Female	28	College	H. R. Management	Right	21	15	20	5
Matched Subjects 27									
Exp	Female	21	University	Arts	Right	13	20	7	12
Cont	Female	21	University	Arts/Psy.	Right	24	8	24	15
Matched Subjects 28									
Exp	Female	22	University	Arts/Psy	Left	24	25	9	6
Cont	Female	23	University	Soc. Sci/Psy	Right	22	7	24	7

Matched Subjects 29									
Exp	Female	44	University	Arts/Eng & Psy	Right	24	25	18	10
Cont	Female	45	University	Arts/Translations	Right	21	12	24	7
Matched Subjects 30									
Exp	Male	23	University	Arts/English	Right	25	21	14	9
Cont	Male	25	University	Arts/English	Right	19	7	22	9

APPENDIX B

McAuley's Revised Causal Dimension Scale

McAuley Revised Causal Dimension Scale (CDSII)

Instructions: Think about the reason or reasons you have written above. The items below concern your impressions or opinions of this cause or causes of your performance. Circle one number for each of the following questions.

Is the cause(s) something:

1. That reflects an aspect of yourself	9 8 7 6 5 4 3 2 1	reflects an aspect of the situation
2. Manageable by you	9 8 7 6 5 4 3 2 1	not manageable by you
3. Permanent	9 8 7 6 5 4 3 2 1	temporary
4. You can regulate	9 8 7 6 5 4 3 2 1	you cannot regulate
5. Over which others have control	9 8 7 6 5 4 3 2 1	over which others have no control
6. Inside of you	9 8 7 6 5 4 3 2 1	outside of you
7. Stable over time	9 8 7 6 5 4 3 2 1	variable over time
8. Under the power of other people	9 8 7 6 5 4 3 2 1	not under the power of other people
9. Something about you	9 8 7 6 5 4 3 2 1	something about others
10. Over which you have power	9 8 7 6 5 4 3 2 1	over which you have no power
11. Unchangeable	9 8 7 6 5 4 3 2 1	changeable
12. Other people can regulate	9 8 7 6 5 4 3 2 1	other people cannot regulate

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Note: The total scores for each dimension are obtained by summing the items as follows:

1, 6, 9 = locus of causality; 5, 8, 12 = external control; 3, 7, 11 = stability; 2, 4, 10 = personal control.

Appendix C.

Conversation With Dr. Edward McAuley

University of Illinois

Department of Kinesiology

Conversation: November 27th, 1995. 4:30pm.

Are there external/internal validity scores for the CDSII?

-There are difficulties with concurrent validity due to the fact that there are no other instruments which assess the same variables.

-There is a study concerning the correlation of the control variable of causal attribution with affect and behavior.

-The CDSII was developed to eliminate the confounding effect between controllability and locus in the original CDS developed by Russell. The revised scale is identical to the original except for the division of controllability into the subcategories of personal and external.

-When Russell developed the CDS it was with the guidance of Weiner. Therefore, face validity was granted by the originator of the three dimensional model.

-Examine the Chi Square in the McAuley, Duncan and Russell article 1992, re: internal validity

Has there been any reviews of the CDSII or has it been used in any thesis?

-I have conducted three studies using the CDSII.

-I have had similar discussions with many graduate students; however, I have not followed these studies.

-I would not mind a copy of your thesis once it is complete

Completed conversation.

Conversation With Dr. Edward McAuley
University of Illinois
Department of Kinesiology
Conversation: April, 1996.

I have data obtained from an experimental and control group. I was wondering what you would suggest as a way to compare the data and find which variables are significantly different?

-I would suggest conducting a MANOVA for the groups and do a univariate analysis to see if there are differences for the variables.

Completed conversation.