FOSTERING ACHIEVEMENT MOTIVATION

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Dedication

This work is dedicated to

Marianne, Fred, Jim, Bob,

Tom, Patti, Becca, Danny,

Johnny, Marianne, Heidi,

and Russell, who, for too

long, forgot what it was

like to have a husband

and a father.

Abstract

Researchers defined achievement motivation as a viable research construct in the early 1950s. Adults increased their achievement motivation scores--often with correlative increased achievement. The literature is replete with ways to increase *achievement* but researchers paid less attention to what could be a core issue--affecting achievement *motivation* itself. McClelland demonstrated repeatedly that adult business people could develop achievement motivation. Alschuler and deCharms found that classroom treatment procedures could yield increased student achievement motivation.

The purpose of this study was to investigate the extent to which treatment activities could foster achievement motivation in a sample of rural Southern Alberta grade four students. To accomplish this, the investigator in the present study employed a combination of the methods used by Alschuler with adolescents and deCharms with younger students. The treatment group experienced achievement motivation action strategies, conceptualized achievement motivation thoughts, related the achievement motivation syndrome to three areas of personal life, and practised what they learned. Two control groups were grade four classes in rural Alberta; one received a pre-test and post-test, the other received the post-test only. This investigator used Gumpgookies (Ballif & Adkins, 1968) to quantify achievement motivation.

Grade four students in rural Southern Alberta did not obtain significantly different Gumpgookies (Ballif & Adkins, 1968) (achievement motivation) scores following four weeks of achievement motivation training modelled after Alschuler and deCharms. Birth order and rank in class emerged as significant variables.

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Chapter I: Introduction

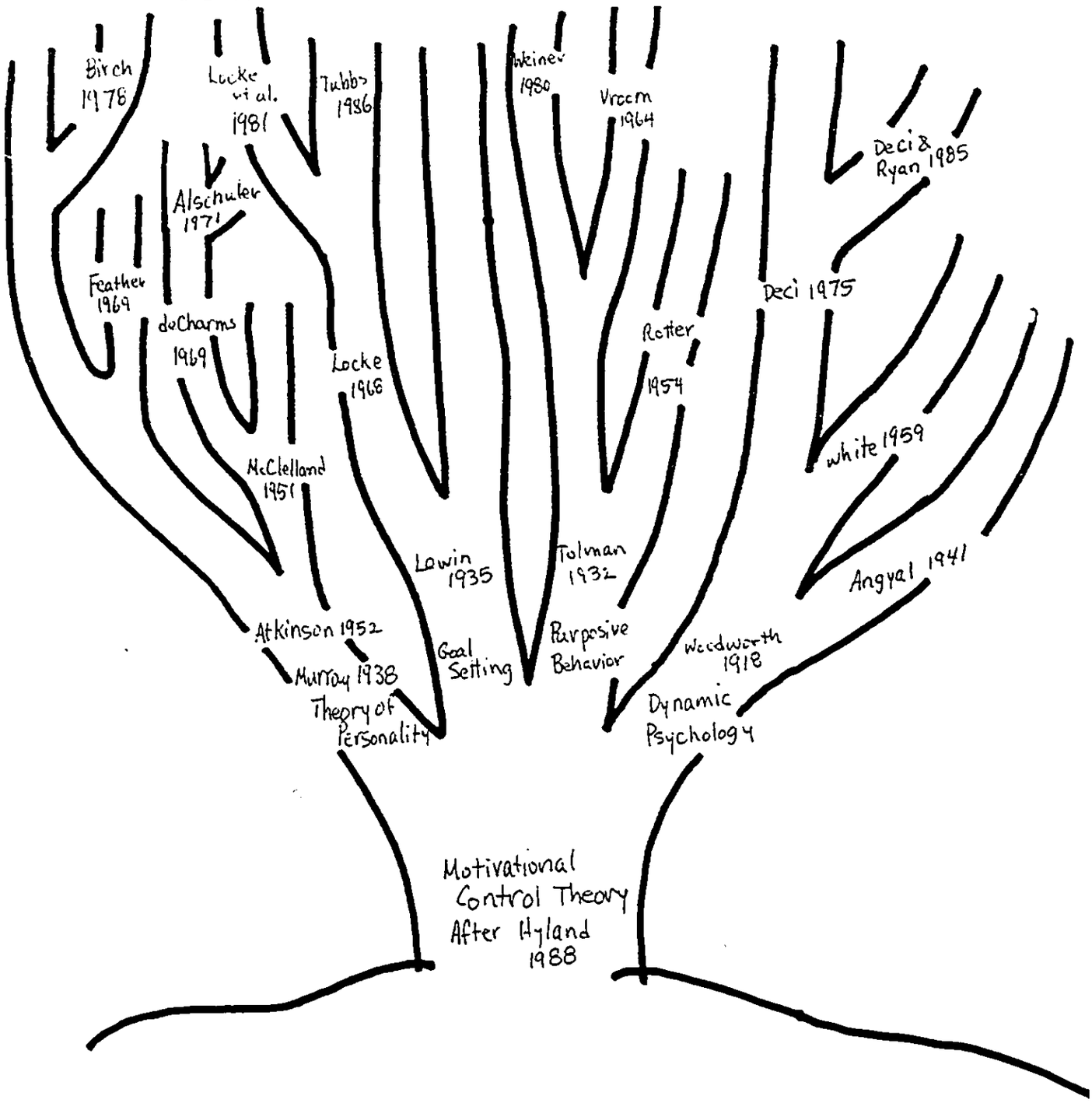
Achievement motivation is "a desire to accomplish something difficult: to master, manipulate or organize objects, people or ideas: to do this rapidly and independently: to overcome obstacles and attain high standards: to excel one's self: to rival and surpass others: to increase self-regard by successful exercise of talent" (Murray, 1938). It is an urge to improve or "a kind of spontaneously recurring concern to do things better" (McClelland, 1969a, p. 10). Achievement motivation has been increased by experimental treatments, and this project is an experiment to ascertain the extent to which achievement motivation could be fostered in rural Southern Alberta grade four students.

Hyland (1988) added to the literature on motivation an excellent synoptic paper in which he attempted to integrate the major concepts and historical developments of behaviour theories. The four main branches mentioned by Hyland began in 1918 with Woodworth's Dynamic Psychology, followed by Tolman's Purposive Behavior in 1932, then Lewin's Goal setting in 1935, and, finally, Murray's Theory of Personality in 1938. Hyland, in 1988, invented a broad concept which he calls "Motivational Control Theory" which he heuristically suggests could be a vehicle for integrating the framework of motivated behaviour.

Hyland's (1988) main references are listed in this paragraph, but they are not included in the references of this thesis. If the reader has specific interest in the historical aspects of Hyland's paper, a full bibliography is included in Hyland (1988). Hyland (1988) shows that Angyal (1941), White (1959), Deci (1975) and Deci and Ryan (1985) basically follow up on Woodworth's (1918) Dynamic Psychology. Rotter (1954), Vroom (1964) and Weiner (1980) follow Tolman's (1932) Purposive Behavior. Locke (1968), Locke and others (1981), and Tubbs

(1986) follow Lewin's (1935) Goal Setting perspective. Atkinson (1952, 1957), McClelland (1951), deCharms (1969), Feather (1969), Alschuler (1971), and Birch (1978) follow Murray's (1938) Theory of Personality. Please refer to Figure 1 for a graphic depiction of Hyland's integrative framework of motivation. Hyland uses his motivational control theory to compare the various theories of motivation. Hyland contends that "these different theories focus on different aspects of a single underlying process" (Hyland, 1988, p. 642). He explains behaviour in terms of either variation in the amount of energy invested in goals, variation in the goals themselves, or variation in the organization of goals. Hyland submits that his suggested integration of different research programs provides a more complete picture of motivational processes. The author of the present study concurs. From Hyland's (1988) synthesis one can easily see that "Fostering Achievement Motivation" fits into Murray's "Theory of Personality", which was subsequently furthered by Atkinson, McClelland, deCharms, Alschuler, and Hillyer (1991). It was refreshing when Hyland showed where the current research fits into a broader whole.

Figure 1. Hyland's Integrative Framework of Motivation



When Murray (1938) devised a taxonomy of twenty basic human needs, he noted that one of these needs was the need for achievement. Murray (1938) speculated on actions which would accompany achievement motivation. His list included making intense, prolonged and repeated efforts to accomplish something difficult; working with singleness of purpose towards a high and distant goal; having determination to win; being stimulated to excel by the presence of others; and to enjoy competition. McClelland defined achievement motivation as "the urge to improve" or "a kind of spontaneously recurring concern to do things better" (McClelland, 1969a, p. 10).

Achievement motivation, also known as "achievement need" and "need for achievement" or **"nAch"**, was first measured by means of thematic apperception tests (TAT). Subjects would be asked to write stories about standardized pictures. Their stories were scored according to how many times they mentioned ideas from Murray's taxonomy.

McClelland, Atkinson, Clark, and Lowell (1953) continued to define and refine the achievement motivation construct. Atkinson (1957, 1964) formulated a dominant theory of achievement motivation which Atkinson viewed as a conflict between approach and avoidance tendencies. According to Atkinson's theory, people have a tendency to seek situations which they expect will bring them pride, and to avoid situations which they expect will bring them shame.

By the 1960s, researchers (McClelland, 1965, 1969, 1972; Heckhausen, 1967; McClelland & Winter, 1969b; Kowatrakul & Stivers, 1969; deCharms, 1976) began manipulating social learning in attempts to develop (teach, increase, train, foster) achievement motivation. Details of this research is included in Chapter 3.

During the period when researchers were investigating whether achievement motivation could be taught, this investigator participated in a 1969 Harry Wilson Corporation sales training course called "Sales Sonics" which focused on principles of applied psychology. The course instructors explained that three main human motives were security, recognition, and competitive achievement. Corporeal morphology was correlated with these motives. Instructors said that endomorphs were generally more security conscious, mesomorphs more recognition conscious, and ectomorphs were, most likely, achievement motivated. Further, security conscious people were more likely motivated by seeing opportunities to avoid negative consequences. In retrospect, these ideas appear to have been applications of Atkinson's (1957) theory. Achievement oriented people were more likely motivated by seeing opportunities to gain positive contingencies, and recognition-minded people could go either way. It seemed that course leaders were saying that achievement motivation was an ultimate motivation, recognition was less prestigious, and security motivation was least prestigious.

Later, as this investigator continued studies in education, he reasoned that, if students could increase their achievement motivation, they could possibly also increase their achievement. The present study was founded on a genuine belief that helping people increase motivation in general, and achievement motivation in particular, would be educationally sound.

The Problem

Although researchers have shown that achievement motivation was effective in varied settings, few educators use achievement motivation training techniques. Achievement motivation training is important in the field of education, but educators have focused more on ways to increase achievement scores than on

affecting achievement motivation itself. After McClelland (1965) demonstrated clearly that adult business people could develop achievement motivation, he and other Harvard researchers (McClelland, 1969a, 1972) began to investigate the possibilities of developing achievement motivation in children. The Harvard researchers, headed by McClelland, found that routine tasks did not lead to increased achievement motivation and they hypothesized that, since many school tasks are not "challenging", achievement motivation is less likely to lead to superior performance in the school situation.

This investigator has long considered the possibility of actually fostering achievement motivation. In folk terms, there is an interest in having students "do the *right* thing for the *right* reason" (or at least for the best reason available at the time). Stated another way, "How does one get children to *want* to do what they *ought* to do?" Alschuler fostered Achievement motivation in inner-city schools in St. Louis with Junior and Senior High School students (Alschuler, 1973) where students were academically at risk (deCharms, 1969, 1976), in adults (McClelland & Winter, 1969), and pre-school children (Koep, 1972). A question naturally follows. What effect would achievement motivation training have in elementary settings in southern Alberta where students already have generally high academic aspirations and do not reject schooling? Students in the treatment sample scored above provincial average in their previous year's achievement test, and were considered by their previous classroom teacher to be a very solid, slightly above average class.

Definition of Terms

Achievement motivation is also called achievement need and **nAch**. McClelland calls this "the urge to improve" or "a kind of spontaneously recurring concern to do things better." (McClelland, 1969, p. 10) The main way

researchers measure achievement motivation by use of thematic apperception tests. Subjects tell stories about pictures and then examiners analyze the stories for achievement motivation themes. There are nine themes which are commonly characteristic of dominant human needs (such as security, recognition, power, affiliation, and achievement motivation). These nine themes are need, action, failure feelings, fear of failure, success feelings, hope of success, world obstacles, personal obstacles, and help. What distinguishes one motivation from another is the aim at which a person focuses these nine themes. If a person aims at exerting influence, need for power is manifest; if one aims at strengthening friendships they manifest a need for affiliation. Only when the focus is on attaining excellence is the motive clearly achievement motivation. Alschuler (1971) identifies the excellence aim as the *sine qua non* of achievement motivation. This means that, only when people are striving to attain excellence in some way, are they manifesting achievement motivation. Other aims manifest other needs.

Background and Rationale

Historical Perspectives

An historical examination of literature was important in gaining a developmental perspective on achievement motivation. Dewey (1913) said students need to be motivated to learn or teachers will have to resort to authority, rewards, and punishment to get students to learn. He said that teachers should look for motivation in the subject matter itself, not in entertaining tricks which many teachers feel compelled to employ. Better still, if motivation can be found or developed within the person, it is most effective. Dewey felt that interest is the best motivator. He said that, if a person lacks interest, tasks become *de*educative because they require sheer strain, *un*educative because they do not point to a future objective, and *mis*educative because they make no intrinsic connection with the learner. So learners must depend on pressure from the taskmaster.

Henry Suzzallo, the distinguished university president, said in the preface to the 1913 Riverside Press edition of Interest and Effort in Education, "active acceptance by teachers [of the substance of Dewey's argument presented in the book] would bring about a complete transformation of classroom methods." Suzzallo contended that if parents and teachers could know only "one treatise in educational procedure, it undoubtedly should be this book" (Dewey, 1913, p. vii).

It is with Dewey's concept of interest that this investigator begins a pursuit--*fostering* achievement motivation. Achievement motivation is a major component of interest because achievement motivation directs facts to be learned or actions proposed towards the agent's own growth. If students increase in achievement motivation, then teachers will have neither to appeal to sheer strength of will or occupy themselves as entertainers. The position of this investigator is that fostering achievement motivation can assist not only in helping us know what the child has been internally occupied with, but also help the child develop a powerful motive force--striving for excellence for the sake of excellence--the self is concerned throughout. If an educator can assist students in developing intrinsic ends, children do not work for the taskmaster but because of a natural inducement--to get a reward *within* that has intrinsic connection with what they are doing. "The educator who associates difficulties and effort with *increased depth and scope of thinking* will never go far wrong." (Dewey, 1913, p. 15). Dewey's ideas were relevant to the present study because, to a great extent, fostering achievement motivation is fostering a productive attitude towards difficulties and effort. This investigator believes that fostering achievement motivation is one strong method to give operation, growth, and completion to internal powers in people.

Achievement motivation training is not without its critics. According to Alschuler (1971, p. xvii), "some people claim that individuals with high achievement motivation are expressing a neurotic desire to prove themselves and, in this way, to compensate for an absent sense of personal worth." A number of social critics have joined the attack on the entrepreneurial spirit by saying we need to replace narrow competitiveness with more pervasive cooperation, and that we need to decrease the concern with "progress" and pay attention to more unchanging, basic values. Alschuler says that modesty in achievement and ambition is matched by an inability to visualize anything richer--inexperience or possessions, or in the world at large. "The generation gap--for rich, for poor, for all--is precisely this: that many kids, for the first time, are growing up without a sense of the future; and that *is* new" (Alschuler, 1971, p. xvii). On the other side, proponents argue that achievement motivation is an essential ingredient for people in leading a mentally healthy adult working lives.

Alschuler (1973) claims that, according to both trait and stage theorists, achievement motivation is a legitimate feature of mental health, but it is not the only healthy trait and it is not equally important during every stage of the life cycle. Most teachers know this instinctively and act on their intuitive knowledge. They give students great warmth and support at certain stage of development, often when students are fairly young; when students are older, teachers more regularly provide stimulating challenges. At any given stage, some students need more support than challenge. In general, trait and stage theories of mental health allow us to ask with greater precision important questions of timing and emphasis of approach to promoting psychological growth. For instance, at what stages of the life cycle is affiliation training most relevant? At what ages should teachers give students achievement motivation nAch training? What other course should teachers give, and in what sequence to promote full development? What would

happen if teachers left unattended and undeveloped certain aspects of mental health? If you were to describe now what kind of course you needed most to develop greater maturity, what would that course be? What precisely are we doing now in schools to promote aspects of mental health directly?

Implicit in these questions and theories are answers to the critics of achievement motivation training: **nAch** is neither healthy nor unhealthy; it is more important at certain times in the life cycle than at others, and more important for certain people than others. One of the reasons this investigator wanted to investigate **nAch** at the grade four level was to determine to what extent it is a viable project at this age. This investigator was aware that there could be some criticism for attempting to foster achievement motivation at this age but my purpose was to investigate how effective achievement motivation training is at the grade four level.

Another significant idea that Alschuler (1971) raised expresses a clear reason for teaching achievement motivation. He says that to increase students' motivation in the classroom it is more important to change the *way* they learn than *what* they learn. The implicit rules of the learning game and the teacher's leadership style determine in large part the way students think, act, and feel about learning. Teachers can readily modify both the rules and leadership style, although generally teachers do not consciously use these methods of motivating students. Teachers can ignore but cannot avoid the direct, pervasive, and continuous influence of rules and style on students' motivation. Some teachers, without realizing it, even work against their own declared purposes by having students learn in ways that are inconsistent with the content of their courses. For instance, in many social studies classes designed to teach citizenship; the teacher is, in fact, the benevolent despot of a vassal state. In achievement motivation

training as well, the rules and leadership style must be consistent with the course. More important, however, there must be opportunities after the course for students to use their increased achievement motivation. Alschuler thinks "it is unethical to increase students' achievement motivation--their independent restless striving for excellence--and then deliberately send them into classrooms where achievement motivation is dysfunctional" (Alschuler, 1971, p. 108). In order to help one avoid this problem and, instead, create learning environments that support the motives one wants to instil, Alschuler describes relevant ways to modify the rules of learning and leadership style in the classroom. Teachers often say and believe they are most interested in achievement, but inadvertently encourage submission. In discussing this topic, one of the authors recalled an incident in high school when he got back a test on which he was to graph a quadratic equation. There was a large red "C-" on the top, much to his dismay. On closer inspection, it became clear that the graph solution was correct. The only errors of omission were the arrow tips at the ends of the ordinate and abscissa. He became angrily determined to submit a perfect paper, an absolute model of detailed accuracy and completeness, no matter how much time and effort it took. With the teacher's standards clear, he decided to meet them through sheer persistence. The author had in fact transformed achievement motivation into an energetic desire to comply with the standards set by the teacher, even though these standards were not personally relevant.

The classroom factors which encourage achievement motivation, compliance, curiosity, or any other motive often are equally suitable, and not adaptable to neat formulas for changing the learning environment. Some teachers clearly discourage rather than nurture achievement motivation and the student's belief in his ability to control his own fate. With the increasing demands for higher education to qualify for prestigious and well-paying jobs, there has been a

corresponding increase in the importance of academic success. The greatest rewards go to those who demonstrate academic excellence. Sometimes academic success is the self-chosen goal of adolescents; often it is not. Frequently, striving for other less prestigious but no less valuable goals that cannot be pursued in schools reflect achievement motivation. Students with high achievement motivation do not always excel academically and sometimes don't even like school. Their feelings may be due to several structural aspects of schooling.

Most school curricula do not encourage individual students to take personal responsibility for setting their own moderate-risk goals. For the lower half of every class, getting an "A" is a very high-risk goal. Yet, striving for a moderate-risk "C" does not yield the payoff so important for later success. It is not surprising that some students with high achievement motivation find school to be at odds with their motivation. Teachers either do not see initiative, independence, and self-reliance because students demonstrate these attributes outside the school. Or teachers see independence and self- reliance as rebelliousness, and anti-social activity. Categorized as problem students, slow learners, or potential dropouts, the students, not surprisingly, may develop negative self-images and a distaste for school. Their attitudes can result in increased rebelliousness and a sense that they have little power to control their environments and their lives. Their achievement motivation fades or remains latent within schools. "The motive most useful to them in economic survival as an adult often is a liability in schooling supposedly designed to help them succeed" (Alschuler, 1971, p. 108).

These ideas pointed up possible dangers in endeavouring to increase achievement motivation. Treatment could stimulate not only achievement motivation but also its accompanying dissatisfactions because treatment students might want more freedom and dignity (Skinner, 1971). Conflicts can occur in

classrooms when power-oriented teachers lead achievement-oriented students, or when teachers want to increase the achievement motivation of students who feel threatened by the opportunity to set their own goals and want to follow teachers' instructions. Such differences in motivation are not insoluble dilemmas. "Students can shape their motivation by learning rules of the classroom just as the status rules of primitive cultures shaped and recruited the most socially useful motives among tribes" (Alschuler 1973, p. 112). This idea is important to the present study because, as is intimated above, fostering achievement motivation is not all positive.

Alschuler believes that, as social systems in miniature, classrooms should reflect the highest cultural values and teach the most socially useful motives. It is possible to increase students' motivation by changing the classroom learning structure and leadership style. "In our experience," says Alschuler, "it is easier for teachers to modify their leadership style after they have restructured the way their students learn. In fact, when learning rules are changed, teachers nearly always require a different teaching-leadership style" (Alschuler, 1973, p. 113).

Theoretical Perspectives

According to Alschuler (1970), students' personal lives are most affected by highly significant experiences which he calls apocalyptic events. In spite of this, Alschuler (1970) suggested that educators obviously do not want to build curricula around regular apocalyptic events that drastically change students' personal lives. On the other hand, teachers need new, more effective, teaching strategies to help students develop stronger motivation, clarify their values, and improve their relationships with others and their views of themselves. As far-fetched as it may sound at first, it is possible to derive practical ideas about promoting personal growth in normal school courses from these rare life-

changing events. Teachers can use the idea that children need highly significant events, and develop teaching strategies that promote milder, but still significant, changes. The problem is to figure out how to promote personal growth without traumatizing students. Alschuler (1970) asks what it is about dramatic experiences that triggers the process of personal change. He wonders how a teacher can introduce acceptable triggering experiences in the classroom more often. Answers to these questions can guide teachers in developing gentler versions of the profound life experiences that increase students' independence in setting and reaching their own goals, to help them expand their curiosity, stimulate them to explore their talents more boldly and to develop the confidence and self acceptance that contribute to greater tolerance and loving relationships (Alschuler, 1970).

Alschuler (1970) reasoned that students need opportunities and motivation. The massive U. S. programs of aid to education, like foreign aid efforts, have concentrated more on providing materials rather than on developing human resources. It is clear in education, as well, that more up-to-date physical facilities, more sophisticated educational hardware, and even money spent on research will not be sufficient unless students also increase their motivation to use their new opportunities. Following the successful development of motivation courses for adults, it seemed appropriate to adapt these procedures for students, especially those students who were "turned off" in school.

Alschuler (1970) said that it was not the purpose of educators simply to stimulate students to make better use of their opportunities in school, but rather to help students attain the goals they set for themselves in or outside of school. The ultimate purpose of school is to teach students knowledge, skills, values, and feelings, that help them live more effective, mature adult lives. This purpose is

consistent with the typical and most appropriate applications of **nAch** training, to entrepreneurial situations in the broadest sense--jobs, athletics, hobbies, administrative activities and learning situations.

Methods to effect substantial changes in achievement motivation are so well established and easy to administer that it is tantamount to malpractice to ignore them. If the medical establishment had discovered a successful treatment twenty years ago the public would demand that doctors include it in their general treatment arsenal. This investigator designed this thesis to add to the literature on achievement motivation and add impetus to a resurgence of achievement motivation training.

Bandura (1977) initiated a well-conceived broad concept which he called self-efficacy. His idea was that psychological procedures, in any form, change the level and strength of this something called "self-efficacy". Bandura proposed that expectations of personal efficacy (like Vroom's expectancy theory (1970)) determine whether a person will engage in coping behaviour, how much effort they will expend, and how long they will persist in their behaviour in the face of obstacles and adverse experiences. Bandura had been studying behavioural change for some time and came up with a construct he hoped would tie the theory of behaviour change together. When self-efficacy was introduced as a variable in understanding behaviour change, what appeared to be unrelated findings started to look more and more like cousins. Self-efficacy was the long-lost relative that linked them together. Schunk is very carefully investigating Bandura's (1977) self-efficacy concept. Schunk and Hanson (1989), Schunk and Others (1987), Schunk and Cox (1986), Schunk and Gunn (1985b), Schunk and Hanson (1985a), Schunk (1982, 1983a, 1983b, 1984), and Woolfolk and Hoy (1990) indicate that they are interested in self efficacy, which involves achievement beliefs and

achievement behaviours. Their up-to-date view appears to be useful in that they measure objective achievement *behaviours* rather than more subjective achievement *motivation*. Self-efficacy and Vroom and Deci's (1970) expectancy theory appear to be contiguous facets of achievement motivation, and, therefore, treatments which change self-efficacy or expectancy ratings could very possibly be considered in modifying achievement motivation.

Hollenbeck and Brief (1987) undertook another study which clarified the roles played by individual differences and goal setting and suggested relationships among generalized self-esteem, self-efficacy and **nAch**. The subjects were 102 undergraduate business students. About 35% of the variance seemed to be related to generalized self-esteem. Self-esteem, **nAch**, and locus of control were related to this first factor. Three common-sense variables were confirmed in the Hollenbeck and Brief (1987) study: in order to successfully perform a goal a person needs ability, self-perception of ability and **nAch**. In common terms, you need skill, belief in yourself, and desire. The reason the investigator in the present study found the question of developing achievement motivation so interesting was because it related directly to the third of Hollenbeck and Brief's factors; fostering **nAch** just might increase desire by arousing and enhancing existing intrinsic motivation.

Why Change nAch?

Ryals (1969) reported improvement in science and mathematics; gains were larger for schools with a high proportion of minority groups who were given achievement motivation by their own teachers. Those who did not receive achievement motivation training from their teachers in general fell more and more behind expected grade levels as they got older. Results like these show that achievement motivation can have positive effects on school performance.

Alschuler (1973) found that 77% who had achievement motivation training retained an above average achievement activity index after a year compared to eleven percent who had affiliation motivation training.

White and Mouw (1976) studied ninety-six Mississippi elementary students to examine effects of need achievement on reading achievement. Students were tested in reading achievement, IQ, and need achievement. The **nAch** measure was found to be independent of IQ and an equal *or better* (emphasis mine) predictor of reading achievement than IQ. This is a substantial reason to recognize achievement motivation as a pragmatic variable in educational research. If studies continue to show achievement motivation as a more dependable predictor or educational achievement than even IQ, then there may come a day when students will receive achievement need tests as routinely as they now receive IQ tests. Maybe future cumulative files will have a spot for **nAch** score alongside IQ, and parents and teachers will be just as interested in *that* score as they are in IQ. The present investigator feels that White and Mouw (1976) uncovered an important observation which should be replicated in future research.

In a study of ninety-one male and female introductory psychology students in Tokyo, Matsui, Okada, and Kakuyama (1982) found that achievement need of the subjects correlated significantly with goal difficulty and persistence. When researchers gave feedback to subjects half way through a perceptual speed task, only subjects who were higher in achievement need performed better after than before the feedback. Sid and Lindgren (1982) in a sample of 108 female and 56 male undergraduates found that both men's and women's **nAch-nAff** scores were positively correlated with GPA.

One very interesting study by Man and Hondlik (1984) investigated the effects of using compulsory lessons in physical education to stimulate

achievement motivation in elementary school students. In that study, students received compulsory lessons involving realistic goal-setting, use of patterns of attribution, norm-referenced achievement evaluation, and cooperation as a variable in successful results. They concluded that "achievement motivation training would be good and advantageous to include in normal educational process and to have school teachers carry it out" (Man & Hondlik, 1984, p. 268).

Nishida and Inomata (1985) found **nAch** was directly related to correlative achievement. In a sample of male undergraduates, 15 high and 15 low need-achievers did rotary pursuit tracking. The high need-achievers scored significantly higher of time on target, goal discrepancy, and heart rate than the low need-achievers. The researchers concluded that high need-achievers showed greater learning of the motor-skills than the low need-achievers, and the superiority of the high **nAch** group could have resulted from the strong task motivation.

Hom and Murphy (1985) studied 63 female college undergraduates to investigate individual differences in differential methods of goal setting. Some goals were assigned by the experimenter; others were determined by the subject. The only effect reaching significance was the interaction of need achievement and goal setting. Low need-achievers who had their goals assigned by the experimenters did more poorly on the task than did low need- achievers who set their own goals or high need- achievers with imposed goals.

Brophy and Merrick (1987), in a study of motivation in junior high students, found that teachers who stressed strategies which focused on, or developed, students' existing intrinsic motivation got better motivational results than teachers who stressed strategies for motivating students to learn. Although Brophy's motivation orientation is not purely *achievement* motivation, Brophy's findings

encouraged the present investigator with the idea that if fostering intrinsic motivation (achievement motivation is *intrinsic*) led to significant positive outcomes, perhaps the present study would find similar results.

Pemberton, Petlichkoff and Ewing (1987) studied four hundred and sixty teenage athletes to determine relationships between achievement goal orientations and projected reasons for dropping out of sport. Five achievement goal orientations were found to be significant predictors for three hypothetical reasons for dropping a sport. The researchers found that motivation to achieve was essential for continuing sport participation. This investigator is of the opinion that achievement motivation is an important variable in persistence in many areas of life, not just sport participation, but this article (Pemberton, et al., 1987) certainly shows that achievement motivation is vital in persistence in sport.

Maehr and Kleiber (1987) gave more global reasons for studying achievement motivation. Achievement motivation relates to future achieving patterns in societies. Since a "competitive edge" depends on human factors, and, since "age is characteristically associated with lowered achievement motivation, can we expect an aging work force, an aging leadership, aging human resources to be up to the challenges that are presented?" (Maehr & Kleiber, 1987, p. 3).

Fyans and Maehr (1987) found motivation (among four variables: past academic achievement, school context, family context, and student motivation) to be the *most* predictive variable of educational achievement. They concluded that school context was the least predictive variable, past academic achievement and family context came in the middle, and student motivation was the most predictive variable of educational achievement. All of this points to the "vital and critical role played by motivation in relating to resultant school achievement" (Fyans & Maehr, 1987, p. 18). Bender and Horn (1988) studied thirty-three male

and twenty-four junior high gifted students to find out about individual differences in achievement orientation and how individual differences affected how students used classroom feedback. They found that achievement orientation was related to performance and how students used feedback. The present investigator's position is that, since Maehr and Kleiber (1987), Fyans and Maehr (1987), and Bender and Hom (1988) are right, the prospect of actually *fostering* achievement motivation is one which ought not to be ignored.

These studies have significant implications on the question of whether fostering achievement motivation is a viable concept. If higher achievement need results in better educational outcomes, then it stands to reason that, if teachers can increase achievement motivation in their students, they *ought* to. This means teachers need to be made aware of, and implement, techniques to foster achievement motivation.

Purpose

The object of this study was to obtain answers to the following three broad questions. First, can a teacher significantly increase **nAch** in rural Southern Alberta grade four students? Second, what method(s) is/are most effective in fostering achievement motivation? Third, what correlations might exist between achievement motivation scores and other standard cross variables such as age, gender, family size, and birth order? These research questions arose from a careful analysis of literature related to achievement motivation.

Limitations of the Study

The scope of this study was to see if achievement motivation could be increased by methods similar to those used by Alschuler and deCharms. The investigator included a description of the methods that Alschuler and deCharms

used in Appendix A. The investigator was unable to obtain random samples. Instead, the investigator selected classes on the basis of cultural similarity but true randomizing was not possible. The investigator did not construct any measurement scales but chose to use Gumpgookies (Ballif & Adkins, 1968) to quantify achievement motivation scores. The investigator was the classroom teacher of the treatment group, and so, to avoid biasing test results, an external person administered the measurement scale. Also, the investigator was unable to control conditions directly in the control groups. Therefore, to avoid prejudicing results, and to maintain double-blind conditions, the investigator did not apprise teachers or students of experimental treatment procedures. The investigator limited this study to grade four students. There will be no follow up.

Hypotheses

For the purpose of this study the investigator chose the following null-hypotheses:

1. that treatment would have no effect on Gumpgookies scores.
2. that practice effect would have no effect on Gumpgookies scores.
3. that age would have no effect on Gumpgookies scores.
4. that sex would have no effect on Gumpgookies scores.
5. that family size would have no effect on Gumpgookies scores.
6. that birth order would have no effect on Gumpgookies scores.
7. that length of residence in the community would have no effect on Gumpgookies scores,
8. that distance from school would have no effect on Gumpgookies scores,
9. that access to a home computer would have no effect on Gumpgookies scores,
10. that rank in class would have no effect on Gumpgookies scores,
11. that wanting to be a "winner" in a group would have no effect on Gumpgookies scores.

Chapter II: Literature Review

Writers have published much on the general topic of achievement motivation, but only a fraction of the literature applies directly to *fostering* achievement motivation, and less still to fostering achievement motivation at the elementary school level. This review includes references to applicable literature on the general topic of achievement need, and it focuses mainly on literature dealing with *fostering* achievement motivation at an elementary school level. (This investigator included a general bibliography of achievement motivation following the References.)

The objective in this literature review is to describe an epistemological structure of achievement motivation and to show what questions researchers have asked and tentatively answered to date. Achievement motivation became the subject of serious inquiry in the early 1950s. At that time, the basic questions being asked related to establishing achievement motivation as an empirical construct. McClelland and others (1953) defined achievement motivation as a discrete phenomenon which he was able to measure using thematic apperception tests (TAT). McClelland documented well the achievement motive in his classic landmark book The Achievement Motive (1953). Once researchers established achievement motivation as a *bona fide* construct, creative investigations began to examine correlations between the motive and many other phenomena. Researchers established business achievement as one of the early correlations (McClelland & Winter, 1969a, 1969b). This well-documented report caught the attention of Richard deCharms at Washington University in St. Louis. The question of whether achievement motivation could be enhanced in school settings intrigued deCharms. He began a four year study through which ten doctoral students received degrees, and, later, did follow-up studies to see what kind of persistence deCharms' interventions effected. deCharms' exhaustive study

involved two thousand black inner-city students. He found that achievement motivation could indeed be enhanced and that the effects were persistent over time, especially among male subjects (deCharms, 1989).

McClelland (1969) found that fantasy most sensitively reflected changes in motivational states, and fantasies concerned with doing well or better than before most accurately reflected increases in induced achievement motivation. McClelland (1969b) stated that a motive drives, directs and selects behaviour. McClelland (1969b) found that achievement-aroused subjects seemed more energized and learned certain tasks faster. Achievement motivated students more often directed their attention to achievement aspects of the environment--they tended to recall incomplete challenging work while low **nAch** subjects generally tended to recall completed tasks better.

Age

Researchers have made a number of attempts to develop achievement motivation in school children and to observe the effect of such training on their behaviour in and out of school. If adults can develop achievement motivation, why not try to develop it in children? "The question seemed eminently worth trying to answer, if only because teachers so often complain that many children are unmotivated" (McClelland, 1972, p. 129). McClelland's motive for research with children was clear. "If psychologists have invented a way for increasing motivation, it might well be applied to school children in such a way as to make them want to work harder and learn more." (McClelland, 1972, p. 129).

McClelland (1972) points out what, for this investigator, was a disturbing revelation--researchers have never shown that **nAch** is consistently related to academic performance--to grades in school, or to scores on tests of academic

talent. Yet studies were done because achievement motivation might work and because it ought certainly to help children to think more seriously about their work habits and career planning, even if it does not directly affect their grades. However, McClelland encouraged this investigator when he asserted that, since direct attempts to increase motivation in school children have been so rare, it seemed likely much might be learned just from making the attempt.

Further, the Harvard group, headed by McClelland, considered it "likely on theoretical grounds that increasing achievement motivation would have slight effects on academic performance" (McClelland, 1972, p. 130). Further, Rahman (1984) contended that it might be possible to train those low in **nAch** so that they could be motivated to become successful entrepreneurs. These findings encouraged this investigator to think that there could be some validity in giving achievement motivation training, even to grade four students in southern Alberta.

Tiwari (1984), on the other hand, suggested that achievement orientation is correlated to age and experiential background. Since maturational factors and social learning influence the development of **nAch** (Feshbach & Weiner, 1982), one might expect, with McClelland (1972), that **nAch** gains would be insignificant. A case in point is that Alschuler (1971) also found that changes in academic performance following achievement motivation training were inconsistent, small, and not impressive.

Maehr and Kleiber (1987) said that society needs to be concerned about the current state of achievement motivation at the macro level so that we retain a "competitive edge". Their paper referred to some preliminary data on about three thousand adults in white-collar occupations. They suggested that modest changes in personal incentives occur with age, and that goal directedness may vary with age. Their findings showed little age-related changes in achievement

motivation; motivational patterns appear to be minimally related to age during the working years of twenty to seventy years of age. Even though the age differential between the youngest and oldest subject in the present study would be less than 36 months, the investigator included age as a variable to relate to achievement motivation.

Kowatrakul and Stivers (1969) tried to give achievement motivation training to kindergarten-age children using games. The results were not impressive. This gave further support to McClelland's (McClelland, 1972, p. 136) contention that achievement motivation training is best suited to junior high and older. With younger children achievement action strategies were more effective than achievement thinking; this effect became less significant around age sixteen (McClelland, 1972, p. 137).

Parker and Johnson's (1981) study on affecting achievement motivation found similar results. They concluded that since "achievement motivation is learned, and its development begins early in life with a critical stage during early childhood, we must identify and plan pertinent experiences during these critical years to maximize development of achievement motivation." (Parker & Johnson, p. 1) They further itemize four behaviour patterns youngsters need to have modelled: active involvement, coping with frustration, self-challenges, and self-evaluation. Children need to learn how to set standards which they can reach. Play and sports help to develop **nAch** but teachers must manipulate probabilities of success and task incentive structures. This study further fuels the idea that fostering achievement motivation is not only a good thing to do with children--it could be essential to enjoyment of life.

Gender

Findings regarding sex difference varied amongst researchers. Early studies employed only male subjects. Later, boys showed greater effects of training than girls (Alschuler, 1971). In contrast, Alschuler (1973) found that training effected more long-range changes in girls' achievement-related activities outside school. deCharms (1976) found no sex difference, Researchers also found that performance in concrete subjects like physics, chemistry, and mathematics improved amongst high school boys in India who had received achievement motivation training compared to those who did not. Mastery courses in achievement motivation were more effective with girls compared to less-structured courses with boys (Alschuler, 1970). Because of Alschuler's findings, the investigator felt it would be advisable to include an investigation of gender differences in this fostering achievement motivation study.

Results were different for girls and boys; achievement motivation training had no significant effect on girls' participation in achievement related activities. Alschuler (1973) presented an important concept when he said that, even though the boys had learned a new achievement vocabulary and maybe could just talk a better game, the results are probably not only due to a desire by the boys to please the investigator. Achievement motivation training courses had demonstrable long term effects on achievement related activities outside the school. Investigating effectiveness of achievement motivation training pointed up some important variables: age, sex, concreteness of subject matter, and degree of structure of the achievement motivation training.

Basow (1986) studied 600 secondary school and 240 university students to examine effects of sex-typing on self-esteem, achievement orientation, and

attitudes toward women. Instrumental traits in achievement orientation were confirmed which Basow suggested could possible indicate a pancultural generality of sex- typing effects. This led the investigator in the present study to check gender differences in fostering achievement motivation at the grade four level in rural Southern Alberta.

Inglehart and Brown (1987) studied gender differences in academic achievement of 885 male and 271 female students between 1976 and 1981 at the University of Michigan medical school. What they found was, not so much differences in achievement itself, but differences in what motivated men as compared to women to achieve. Apparently, a male clock works just as well as a female clock. What's different is what makes them tick. According to Inglehart and Brown, if you want to predict male achievement, you are best advised to consider mastery-related values (like knowledge-based achievement tests) as predictors. On the other hand, if it is female achievement you want to predict, use person-related and social values as predictors. "These gender differences in values lead to different motivations to achieve which in turn influence the level of achievement" (Inglehart & Brown, 1987, p. 14).

Further, Inglehart, Nyquist and Brown (1987), in studying 160 male and 90 female subjects in a bachelor of arts-doctor of medicine program at the University of Michigan, found the same results and concluded that men's and women's achievement orientations arise out of different motivations and are influenced by different factors. Even though the present study investigated children, based on further persuaded to include a gender as one of the key variables in the present study. If gender marks a decided difference in motivation orientation in adults, perhaps a difference will show up in children, too.

Gower, Cole and Phillips (1987) investigated gender differences in undergraduate psychology students at Texas Christian University. Twenty-eight males and twenty-four females participated in a game called Prisoner's Dilemma. Males and females used different strategies to play the game, but, according to the researchers, achievement motivation could not adequately explain differences in game playing behaviour. "Regardless of gender, some individuals in a competitive situation are motivated by a desire to win and others are motivated by a desire to avoid losing" (Gower, Cole & Phillips, 1987, p. 4). This suggestion is consistent with Atkinson's (1957) theory of achievement motivation, but it was not sufficient to explain differences in playing strategies in the Prisoner's Dilemma study. The investigator in the present study was interested to see if gender would have a measurable bearing on changes in achievement motivation resulting from achievement motivation training.

Piedmont (1988) studied fifty-eight male and eighty-eight psychology students, investigating gender and fear of success (**FOS**). Piedmont claims that some women find themselves in an approach-avoidance conflict. While they have a motive to achieve and successfully compete against standards of excellence, they also have a motive to inhibit such performance because they associate success with social isolation and loss of femininity. Piedmont (1988) adds that fear of success is a salient predictor of behaviour only within a particular subset of women and only when it is aroused; it should not be over-generalized to all women. Since Piedmont's study associated **FOS** with social isolation, the dilemma which Piedmont puts before us looks like it could be related to the established inverse **nAch-nAff** relationship (Lindgren, 1976; Peterson et al., 1986; Nash, 1987; Gross, 1989). Further research could possibly show whether Piedmont's **nAch-FOS** relationship and Lindgren's **nAch-nAff** relationship are different facets of the same phenomenon.

Haynes, Comer, and Hamilton-Lee (1988) studied 72 female and 76 male tenth graders to find whether there were significant sex and achievement status differences in the use of learning and cognitive strategies, and what was the nature of the interaction between sex and achievement status. They found significant sex effects on eight of their 10 subscales; motivation and attitude were two. However, Grabinger and Jonassen (1988) did not find gender differences in need for achievement in 79 undergraduate education students who chose independent study courses. Grabinger and Jonassen found their subjects to be high in **nAch** and internal locus of control, but GPA, gender, major, and prior knowledge did not influence their decision to take independent studies. In the present study, because the children were much younger, the investigator hypothesized that no differences in achievement motivation would be attributed to gender differences.

Family Context

Berens (1977) found that **nAch** was related to child rearing practices. She suggested the possibility of an optimal range of mastery demands for socialization of high **nAch**. There needs to be a balance of interaction and support combined with controls, expectations and achievement demands. Low **nAch** boys got inadequate support and too much control; in fact, they received significantly more control than positive interaction. Low **nAch** girls got support but no goals, standards or controls. Girls had more positive interaction than control. Balanced patterns of socialization--neither too much nor too little of interaction, controls, expectations, achievement demands--were evident amongst high **nAch** boys and girls. Berens concluded that "the important factors appear to be expectations and demands for achievement and independence made at an appropriate age, in this sample around age 5, the age of school entrance, coupled with positive interaction

or support and a moderate amount of control) (Berens, 1977, p. 2). These factors led to high **nAch** in both sexes suggesting that there might be an optimal pattern for socialization which produces gender general **nAch**. This study supports my rationale for attempting to foster **nAch** at the grade four level which is younger than what McClelland expected effective **nAch** enhancement. Certainly the process variables which Berens found to be related to high **nAch** are similar to characteristics of effective classrooms and schools. So it seemed natural to use the techniques in classroom settings which Berens found effective in family settings. On the other hand, it is possible that presage variables originating at the family level would be stronger antecedents of achievement motivation than the treatment in this single study. If so, it would be important to include questions about the family in order to interpret statistical outcomes of this study.

Carr and Mednick (1988) also found that family influences were main sources of differences in achievement motivation. Non-traditional sex role training led to higher achievement motivation for girls, and traditional sex role training led to higher achievement motivation for boys. Ninety-seven boys and one hundred and three girls who ranged in age from four and a half to six and a half, and their mothers filled out questionnaires and did achievement motivation tests. They suggested that, since their data were verified by three separate measures, future researchers in achievement motivation studies should also use several measures of **nAch**. Their study showed that socialization practices have different effects on **nAch** depending on who is being nurtured. "What is good for the goose, may not be good for the gander" (Carr & Mednick, 1988, p. 178). Therefore, a study of achievement motivation should likely include questions of family context. The present study investigated family size and birth order with **nAch**.

Birth Order

Sampson (1962) using three separate samples of subjects, combined results from three studies and pointed out relationships betweens gender, birth order and need for achievement. First born females were more significantly involved in independence training than first born males which produced greater need for achievement and greater resistance to influence for first born females. First ordinal position males, on the other hand, had greater affiliative dependency and greater conformity to influence.

Kammeyer, Miller, & Mitchell (1972) also found that birth order was related to achievement motivation. The researchers suggested that younger minority boys were less achievement oriented because of the particular combination of relationships they have with their parents.

Falbo & Richman (1977) in a study of 1092 undergraduates (785 males and 307 females) found that father's age, gender, and family size were all related to need achievement. Younger fathers, males, and smaller families were associated with higher need achievement.

Hall and Lee (1981) studied 85 boys and 94 girls in an urban elementary school. They did the Ring Toss Game in a manner similar to the Pebble Toss Game in the present study. Results indicated that the firstborn boys set significantly higher goals and actually performed better on the ring-tossing task than all the other groups. Firstborn boys had greater need for achievement than first born girls or later-born children of either sex.

Kliewer and Weidner (1987) studied elementary school aged children and their parents. There were 41 girls and 32 boys from fourth, fifth and sixth grades in a private grade school in the Northwest. In their investigation of goal-setting

behaviour in the children and their parents' aspirations, the researchers found that mothers did not report different aspirations for their Type A (competitive, urgent, aggressive, easily provoked) and Type B (persons who do not display the above characteristics) children. Fathers, on the other hand, set high goals for their Type A sons and perceived that the sons did not attain them. Parents' aspirations were not consistently related to Type A behaviour in daughters. Based on these findings, Kleiwer and Weidner (1987) suggested that the father may play an important role in the development of Type A behaviour in sons.

Polit and Falbo (1987) added more information regarding birth order and family size and their relationship to other variables including achievement motivation. Their study was a quantitative literature review in which they compiled statistics that had been reported in 141 studies and analyzed them to find significant relationships. The purpose of their study was to see if only-children were advantaged or disadvantaged with respect to their siblinged counterparts. Only children scored significantly better than other groups in achievement motivation. This finding was reliable and persisted across four comparison groups. Two examples are sufficient to mention here. Achievement motivation was the most significant variable (in terms of advantages only-children had over their siblinged counterparts) out of 17 personality categories. When compared in specified family size comparisons, only-children had achievement motivation (out of 5 topic clusters) as the main difference between them and siblinged others. This was another reason why the investigator in the present achievement motivation study felt it was appropriate to include birth order and family size as pertinent variables.

The present study did not address complex intra-family relationships but, because family variables seem to be so consistently related to achievement need,

(Berens, 1977), (Carr and Mednick, 1988), (Sampson, 1962), (Kammeyer, Miller, & Mitchell, 1972), (Falbo & Richman, 1977), (Kliewer and Weidner, 1987), (Hall and Lee, 1981), (Polit and Falbo, 1987), the investigator chose to examine interaction of **nAch** and, at least, family size and birth order.

nAch-nAff Dichotomy

Sid and Lindgren (1982) found that women's **nAch** scores were correlated with scores on the Strong Vocational Interest Blank and the California Psychological Inventory scales. Sid and Lindgren found this to be unexpected because most studies report nonsignificant findings for female subjects. They suggested that for women in comparison to men commitment to a high-status profession seems more likely to require a suppression of **nAff** in favour of **nAch**. The **nAch-nAff** scores were positively correlated with GPA for both sexes. This also suggests that achievement motivation could be useful in affecting generic achievement gains. This suggests that achievement motivation training could be one means whereby teachers could ameliorate possibilities for gender equity, which is one solid reason for engaging in regular achievement motivation training.

Peterson and Roscoe (1986) administered Lindgren's (1976) **nAch-nAff** scale to 257 female undergraduates and found that students in child development studies were lowest in achievement need but highest in need for affiliation. Students in housing and interior design had the highest need for achievement. Service industry students had moderate need for achievement. Lindgren (1976) had also mentioned the inverse relationship between **nAch** and **nAff**. Gross (1989) said that gifted youth must deal with this forced-choice dilemma. According to Gross, it is very difficult for gifted youth to pursue excellence and maintain intimate relationships; most feel they have to choose one *or* the other. In

order to see if the inverse relationship between **nAch** and **nAff** would exist in the present sample, this investigator included a forced choice question in the demographic questionnaire. Students were required to respond whether in a group they would rather be the boss, a friend, or the winner, and give reasons for their answer. Answers could indicate respectively **nPow** (Power), **nAff** (Affiliation), or **nAch** (Achievement).

Rank in Class

One key finding was that the need to achieve did not always lead to superior performance at all sorts of tasks. Had it, suggests McClelland (1969b), researchers could have used superior task performance itself as a measure of motivation. **nAch** only led people to perform consistently better if tasks were "challenging" with a moderate probability of success. It is therefore unsafe to infer that high test scores mean higher **nAch**. Also, conscientious performance leading to high grades does not always indicate high **nAch**. In fact, a person's belief that they are achievement oriented is in no way connected with whether they get a high **nAch** score. Researchers must clearly differentiate attitudes towards achievement and **nAch** *per se*.

Summary of Research Studies

To summarize the research studies from the literature on achievement motivation there are six main points. First, one can say that teachers *can* foster (develop, teach, increase, train) achievement motivation. They are most effective with business people. Researchers have fostered achievement motivation in adults (McClelland & Winter, 1969b), high school students (Alschuler, 1973), St. Louis fifth grade to high school inner-city students (deCharms, 1976), and pre-school students (Koep, 1972).

Second, most researchers (McClelland, 1972), (Tiwari, 1984), (Maehr & Kleiber, 1987), (Kowatrakul & Stivers, 1969), (Parker & Johnson, 1981) found that age was a factor in achievement motivation. Effectiveness of achievement motivation training seems to be related to developmental level of subjects (McClelland, 1969). In fact, there was some indication that attempts to foster achievement motivation with subjects younger than high-school age would probably be ineffectual (McClelland, 1969). McClelland (1972) proposed that researchers would find that about age fifteen would be a threshold for effective achievement motivation training. However, researchers have shown that achievement motivation training has been effective with pre-school youngsters (Alschuler, 1971), (Koep, 1972) and upper elementary students (deCharms, 1976) which contradicted McClelland's (1969) earlier hypothesis. No writer suggested that achievement motivation training would be either harmful or completely unjustified by the law of diminishing returns.

Third, there are gender differences. Without controlling for various presage variables males tend to have higher **nAch**. (Alschuler, 1970, 1971, 1973), (deCharms, 1976), (Basow, 1986). However, when variables (such as values) are controlled for, gender alone does not explain differences in achievement motivation (Inglehart & Brown, 1987), (Inglehart, et al., 1987), (Gower, et al., 1987), (Piedmont, 1988).

Fourth, family context emerged as a significant factor in achievement motivation. Whenever birth order was used as a conjoint research variable, researchers found it to be significant (Sampson, 1962), (Kammeyer, et al., 1972), (Falbo & Richman, 1977), (Hall & Lee, 1981), (Kliewer & Weidner, 1987), (Polit & Falbo, 1987). Firstborn children had a far greater tendency to have higher achievement motivation than did later-borns. Related to birth order, other family

context variables were significant. Family size (Falbo & Richman, 1977). (Polit & Falbo, 1987), and father's age (Falbo & Richman, 1977) are two that stand out.

Fifth, it was unusual to find subjects who scored high in need for achievement *and* need for affiliation (Pearson & Roscoe, 1986). Because of the generally dichotomous interrelationship between these two variables, psychometricians have developed a host of validated measures (Ballif & Adkins, 1968), (Lindgren, 1976), (Fineman, 1977), (Ray, 1982), (Sid & Lindgren, 1982). The measurement tool, Gumpgookies, which was used in the present study, is a measure, based, to a certain extent, on the **nAch-nAff** dichotomy.

Sixth, achievement motivation and achievement itself are not always directly related (McClelland, 1969b). This is the bottom line of the whole question, and, even though McClelland was the researcher who first reported this observation, he spent years offering achievement motivation training in hopes that such training "might well be applied to school children in such a way as to make them want to work harder and learn more." (McClelland, 1972, p. 129).

Present Study

Since studies have generally concentrated on populations of academically-at-risk students, there is a need to establish what outcomes can be expected when teachers give achievement motivation training to students who are generally not at risk. The purpose of the present study was to address salient research questions which arise from a careful analysis of literature related to achievement motivation. In particular they included: First, could certain treatment activities significantly increase achievement motivation in grade four students? Second, would a rural setting have any significant effect? Third, what outcomes could an investigator expect from achievement motivation training with students who are not "turned off" to education? Fourth, in this particular study how would changes in achievement motivation correlate with an array of standard cross variables: age, gender, family size, birth order, and access to a personal computer. One purpose in fostering achievement motivation is to enhance correlative achievement. That is, increased achievement which, hopefully, would accompany increased achievement motivation. If correlative achievement is not a consistently predictable outcome of increased achievement motivation, then what other possibilities exist to justify bothering to increase achievement motivation at all? Therefore, this investigator reasoned that it would be appropriate to attempt to replicate the spirit of Alschuler's and deCharms' studies at a grade four level in a rural Southern Alberta setting.

Chapter III: Methodology

Research Design

The research design was a standard two by three factorial study consisting of three groups, with one receiving treatment procedures and one control group receiving no treatment, plus a second control group receiving a post-test only to evaluate possible response set in the first two groups. Treatment procedures consisted of experiencing **nAch** action strategies, conceptualizing **nAch** thoughts, relating the **nAch** syndrome to three areas of personal life, and practising what they learned. Control procedures consisted of regular classroom work in the control classroom. It was a single-blind study in that this investigator did not apprise the control groups what was taking place with the treatment group.

Sample and Selection

Approximately seventy grade four students were chosen from Stirling School, Raymond Northside Elementary School, and Magrath School. Stirling School was the treatment group and the other schools served as control groups. These schools were chosen for several reasons: Stirling School and Raymond Northside Elementary School have a reputation of being similar in academic achievement and they are culturally similar, and so the selection was done to reduce extreme variability of backgrounds. The investigator expected a certain commonality to exist among students who have predominantly similar culture. Grade four was chosen because academic achievement has been increased in subjects as old as adults and as young as grade five but this study examined effects of achievement motivation training with students as young as nine years old in grade four. This ran counter to findings by McClelland (1969) who suggested that achievement motivation is, predictably, not effective with subjects

younger than Junior High School age, but it concurs with deCharms (1976) grade five studies, Koep (1972) who found significant motivation changes in kindergarten children, Berens (1977) who asserted that achievement motivation training should start early, and Parker and Johnson (1981), who said adults must develop pertinent experiences during critical early years to maximize achievement motivation development.

Procedures

The examiner measured both classes for baseline achievement motivation scores, and administered a questionnaire to obtain information regarding age, sex, family size, birth order, distance lived from school, and access to a personal computer. The treatment group engaged in treatment activities.

Then the examiner again measured both classrooms for achievement motivation scores. The investigator then analyzed the data to see relationships between treatment activities, demographic variables and measurement scores.

Treatment procedures consisted of experiencing **nAch** action strategies, conceptualizing **nAch** thoughts, relating the **nAch** syndrome to three areas of personal life, and practising what they learned. For a detailed description of the procedures that the investigator used, please see Appendix E "A Mastery oriented **nAch** Course" in Alschuler (1971, pp. 195-211). deCharms' Origin Manual contains twenty-five exercises, each designed for use on a particular day of the week over a five week period. The course outline and student notes from the present study are included in Appendix B.

Instrument Description

This investigator used Gumpgookies to measure **nAch**. Gumpgookies is an objective-projective test consisting of a number of stylized drawings of a nonsense creature called a Gumpgookie performing various **nAch/nAff** related activities; the student then decides to what extent they are like the Gumpgookie. This is a very commonly used scale in getting valid **nAch** scores especially for young children. Gumpgookies has been extensively field validated. Bonnie L. Ballif and Dorothy C. Adkins (1968) developed the test at the University of Hawaii. They designed the test to measure motivation to achieve in school in young children from three and a half years old to eight years old. Reference Tests and Measurements in Child Development: Handbook II, (Volume 1, 1976, Page 423) listed the source from which the measure may be located. However this source no longer carried the measure at the time of this study. The investigator obtained test booklets and administration manuals from Dr. Robert Koep at the University of Lethbridge Faculty of Education. Dr. Koep used Gumpgookies in his dissertation (1972) on motivation in kindergarten children. Gumpgookies is a test consisting of seventy-five dichotomous items, each depicting two amorphous characters called Gumpgookies. The examiner describes each Gumpgookie orally, and children decide which one is theirs or most like them. The test authors constructed Gumpgookies to test five hypothetical components of motivation--school or work enjoyment, self-confidence, purposiveness, instrumental activity, and self-evaluation. In the initial format, problems in interpretations of extensive factor analyses revealed that response sets dominated some factors, depending on the position of the answer (left vs right and up vs down) and order of presentation of the textual material. The authors developed a method of factoring that would partial out these response sets and lead to substantively interpretable factors. The intent of the factoring was to substantiate a claim of content validity, not to lead

to highly dependable measures of each factor. The problem of response sets does not affect the total score, since examiners can control in advance answer position and order of presentation, as well as factors for later tests based on the original data. Examples of two items are given below.

This gumpgookie does what it wants to.
This gumpgookie does things well.
Which is your gumpgookie?

Learning to count makes this one feel good.
Learning to count makes this one feel bad.
Which is yours?

Gumpgookies was a precursor of a new improved sixty-item test called Animal Crackers which is like Gumpgookies in that they are both objective-projective techniques that require children to choose between alternative behaviours or attitudes, described verbally, that show differences in motivation. In Animal Crackers the behaviour is engaged in by a variety of little animals. Each test item consists of an illustration of two *identical* animals and two verbal descriptions.

In Animal Crackers the child is told that they have their "own" animals and that, although they look like the other animals, their own animals behave as the child behaves--the animals like what the child likes and they do what the child does. As the examiner points to each animal in turn and describes it, they ask the child to identify their own animal. Twinning of the animal pictures was intended to reduce response set but Ballif and Adkins (1970) reported that, through a factor analytic procedure, they had obtained a Gumpgookies program that yielded factors that were completely uncorrelated with the response set scores. The investigator in the present study did not use Animal Crackers for several reasons. First, he was unable to secure a copy. Second, Gumpgookies lent itself more favourably to group test administration because two Gumpgookies are depicted

acting out the examiner's verbal descriptions while the two Animal Crackers are identical to one another. Because of that, young children, using Animal Crackers, could more easily become confused as to which animal cracker the examiner meant unless they were tested individually. Third, Animal Crackers was designed to be used with pre-schoolers and first graders, while the subjects in the present study were grade four students, and Adkins & Ballif (1970) said that Gumpgookies was administered to fourth grade students in Hawaii. So, based on these considerations, it appeared to this investigator that Gumpgookies would be the best test available to measure achievement motivation in grade four school children, and completely adequate for the requirements of the present study.

Instrument Scoring

Gumpgookies includes a scoring key that identifies which answers indicate achievement motivation and which do not. The examiner scores items as right or wrong and a raw score is an indicator of motivation to achieve in school. This investigator used the demographic questionnaire (attached in Appendix D) to determine age, gender, family size, and birth order.

Data Collection

According to Gumpgookies administration manual, results have not been normed using male administrators. The test authors therefore recommended that a female person should administer Gumpgookies. Accordingly, this investigator engaged the services of an examiner, a certificated female teacher, to administer the test twice to the treatment and first control groups and once to the second control group. The test was administered to each class as a whole. The examiner read the script which accompanies the test and students marked one of two Gumpgookies in each cell of the test.

On Monday, May 7, 1990, the examiner went to Stirling School Grade Four Class and administered Gumpgookies as a pre-test to the treatment group. On Thursday, May 10, 1990, she administered it to the Grade Four Class in Raymond Northside Elementary School, the first control group as a pre-test. A month later, on June 1, 1990, the examiner administered Gumpgookies to the Magrath School Grade Four Class, the post-test-only control group. On June 6, 1990, the examiner administered Gumpgookies to the treatment group as a post-test. On June 8, 1990, she administered it to the first control group as a post-test. This investigator included a copy of the Gumpgookies test and administration manual in Appendix E.

Chapter IV: Results and Data Analysis

The investigator in the present study chose one-tailed T-Tests to determine significance between group means because the sample size was small (the treatment group and control group each had 20 students and the second control group had 27 students). The investigator selected one-tailed tests because he was only interested in increasing achievement motivation scores. If scores stayed the same, or went down, they would show that fostering achievement motivation did not result in **nAch** gains. This investigator used .05 level of significance throughout so that he would not commit a Type I error by rejecting the null hypotheses unless there was at least ninety-five percent confidence that it should be rejected.

If treatment did not increase **nAch** then it would be useless to do it. We don't want to put forward a tremendous effort just to stand still, or slip backwards. Therefore, because the investigator was only interested in treatment effects which proved the efficacy of the treatment activities, a one-tailed test of significance was all that was required to test hypotheses 1 and 2 (treatment effect and practice effect). Two-tailed tests were used to check interactions of demographic variables and Gumpgookies scores because the investigator was interested in any differences between means irrespective of the direction of the differences.

The investigator decided that, if the control post-test results *were not* significantly different from control pre test results, then differences in treatment results could be attributed to treatment. However, if control post-test scores *were* significantly different from control pre test scores, it could indicate practice effect. At this point it would be necessary to bring in the second control group which only took the post-test. If results from the second control group were more

like the first control *pre-test* it would clearly point to practice effect as a main reason. In the statistical analysis the investigator did not find a significant difference between pre and post-test scores for the first control group. The investigator did not have to use the results of the second control group to confirm or reject the possibility of practice effect because there was no statistical suspicion of practice effect.

A standard item alpha analysis of Gumpgookies items yielded .9434 for the pre-test and .9165 for the post-test. Although the reliability was high, the item mean of .8097 showed that the basal was too low--scores ceilinged-out consistently higher than expected. Based on these data, this investigator speculated that Gumpgookies was probably scaled lower than might have been appropriate for this age group. Another possible reason Gumpgookies did not appear adequately sensitive with this age of students could be the "notion of social desirability" (Feshbach & Weiner, 1982, p. 291). It is possible, since Gumpgookies was developed in the mid 1960s, that social conditions have influenced students this age to be more sophisticated and more able to select test items on a sense of what might be most "acceptable" to the examiner. This investigator would not use it again to measure achievement motivation in grade four students.

Gumpgookies scores were manifest below the .05 level for birth order, rank in class, and group preference. This investigator used pre-test and post-test Gumpgookies scores to analyze the scores of the treatment group and the first control group. An analysis of variance of pre-test results indicated no significant difference among the groups. The three groups' raw scores, means and standard deviations for both pre-test and post-test appear in Appendix F.

Chapter V: Discussion

The primary purpose of this study was to determine whether certain treatment activities could be increase achievement motivation scores in rural Southern Alberta grade four students. In the treatment group and first control group an examiner used Gumpgookies to determine each child's motivational level. The three samples then experienced different types of interaction. This chapter deals with the analysis of the data yielded by these procedures and the testing of the stated hypotheses considering that analysis.

Table 1 is a cross breakdown table which shows that means for all five testing conditions were similar. That is, there was little difference between pre and post-test scores for either the treatment or control groups. Analysis of variance showed that no two groups were significantly different at the 0.05 level. Since the pre-test means and the mean of the second control group were not significantly different, then differences in post-test means could be attributed either to treatment or to response set. However, that argument is strictly academic because there were no significant differences between post-tests, either. On the other hand, it cleared up the question of whether post-test scores could legitimately be pooled when doing analyses with demographic variables. Since means were similar, the investigator chose to pool all three experimental groups to generate a larger sample size (n=67) for demographic analyses.

Treatment Effect

Table 1

Mean Gumpgookies Scores in Pre- and Post-Tests

CLASS	Mean / Count / Std Dev	pre-test	post-test	Row Total
TREATMENT GROUP		61.05	59.15	60.10
		20	20	40
		10.76	11.31	10.94
PRE/POST CONTROL		59.20	58.75	58.98
		20	20	40
		11.55	10.62	10.95
post-test CONTROL			59.74	59.74
			27	27
			7.34	7.34
Column Total		60.13	59.27	59.59
		40	67	107
		11.06	9.52	10.08

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GUMPGOOK	PRE_TEST			
	20	61.05	10.76	2.41
	20	59.15	11.32	2.53
GUMPGOO2	post-test			

(Difference) Mean	Standard Deviation	Standard Error	2-tail Corr.	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
1.90	5.89	1.32	.86	.00	1.44	19	.17

The bottom part of Table 1 is a paired T-Test which compares pre-test and post-test scores of the treatment group. The difference was not significant (p=.083). Therefore, this investigator inferred no substantial effect from treatment or practice effect in the treatment group, nor from practice effect in the control group. The investigator failed to reject the first null hypothesis that

treatment would have no effect on Gumpgookies scores, and the second null-hypothesis that practice effect would have no effect on Gumpgookies scores.

Table 1 compares pre-test and post-test scores of the treatment group, the control group which received the same pre and post-tests as the treatment group, and the control group which received only the post-test. The table shows that T-tests did not reveal significant differences in Gumpgookies scores which this investigator could attribute to either treatment or practice effect. The investigator included this table to demonstrate that practice effect did not have a significant influence on Gumpgookies scores in the first control group. This helped to establish that any changes in scores of the treatment group could be attributed to treatment alone and not to response set. The investigator included the second control group to ascertain a possible practice effect. So the function of the second control group served its purpose.

One could be tempted to conclude prematurely that the null-hypotheses are confirmed, that there would be no difference effected by treatment or by response set. However, since Alschuler (1970) and deCharms (1976), who used similar treatment procedures, found significant differences with similar age students, this investigator speculates that Gumpgookies may not have been adequately sensitive for students this age. Alschuler and deCharms used thematic apperception tests to measure achievement motivation.

Practice Effect

Table 2

T-Test of Control Group Scores

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GUMPGOOK	PRE_TEST			
	20	59.20	11.55	2.58
	20	58.75	10.62	2.37
GUMPGOO2	post-test			

(Difference) Mean	Standard Deviation	Standard Error	2-tail Corr.	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
.45	4.62	1.03	.92	.00	.44	19	.67

Table 2 is a paired T-Test which compares pre-test and post-test scores of the control group. The table shows again that the T-Test did not detect significant differences (p=.33) in achievement motivation scores. This could indicate that there was negligible effect response set, and, since the results from the second control group were not significantly different from either the pre-test or post-test scores of the first control group, we can not reject hypothesis 2 that practice effect would have no effect on Gumpgookies scores.

The next item to be considered was age. At first the investigator thought it might be appropriate to look at age by split halves. Data were split at the median age of 120 months.

Age Effect

Table 3

T-Tests for Independent Samples of AGE

GROUP 1 - AGE EQ 1: YOUNGER
GROUP 2 - AGE EQ 2: OLDER

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GOMPGOO2 post-test				
GROUP 1	36	60.19	8.82	1.47
GROUP 2	31	58.19	10.33	1.86

	Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
1.37	.37	.86	65	.40	.85	59.41	.40

Nothing significant (p=.40) appeared when the younger students were compared to the older students. In a conversation with D. M. Connolly (1991) the investigator agreed that, relative to this study, differences in achievement motivation between younger or older grade four students was probably not the relevant issue. On the contrary, it was really just a question of whether treatment would have significant effect or not at this age--not whether effects would be significantly different for older grade four students than they would be for younger grade four students. Based on the literature regarding age and achievement motivation, the findings in this study concur with most and differ with one or two. McClelland (1972) expected that children under age fifteen would not show significant **nAch** gains. Tiwari (1984) found insignificant differences by age. Alschuler (1971), with teenagers, and Kowatrakul and Stivers (1969), with kindergarten-age children, found that results were not impressive. Maehr and Kleiber (1987) found that, even with adults, age was not a significant consideration. The results of this study concur that age was not a significant

factor. Parker and Johnson (1981) hoped that people would try to stimulate achievement motivation in children because its development begins in early childhood. Koep (1972) found significant increases in Gumpgookies scores in kindergarten students following his treatments. It could be that **nAch** has its significant roots earlier than grade four, which could account for that fact that, while age did not appear to be a factor at grade four, family variables (family size, and birth order) *were significant*. Perhaps Parker and Johnson are the researchers who have uncovered the rosetta stone of achievement motivation. Perhaps we should be concentrating our efforts on some age of pre-schooler. White's twenty-eight years of research on child development (1979, 1988) led him to believe that children establish their intellectual and emotional proclivities by three years old. According to White, it is at home, with parents, by age three, that people build significant foundations (White, 1979, 1988). This points to possible future research.

Gender Effect

Table 4

T-Tests for Independent Samples of GENDER

GROUP 1 - SEX EQ 0: MALE
GROUP 2 - SEX EQ 1: FEMALE

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GUMPGOO2 post-test				
GROUP 1	30	57.37	10.03	1.83
GROUP 2	37	60.81	8.93	1.47

	Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
1.26	.51	-1.49	65	.14	-1.47	58.75	.15

Table 4 shows that differences between girls' and boys' Gumpgookies scores were not significant. One notable item in Table 4 is that gender difference approaches significance ($p = 0.15$). While this significance is not adequate to confirm or reject any hypotheses, it is interesting to point out that other researchers (deCharms, 1969; Ryals, 1969; Alschuler, 1970 and 1973; Berens, 1972; Sid & Lindgren, 1982) found gender differences in achievement motivation scores to be significant. The literature varied on the question of gender difference in achievement motivation. The author of the present study mentioned in Chapter Two that findings regarding sex difference varied amongst researchers. deCharms (1969) found that achievement motivation training effects were persistent over time, especially among male subjects. A difference between the present study and deCharms (1969) is that deCharms' gender difference was most noticeable for persistence. However, in the present study, the investigator did no follow-up to measure possible persistent effects of achievement motivation

training. Seven years later, deCharms (1976) found no sex difference, while Alschuler (1970) found that training effected more long-range changes in girls' achievement related activities outside school. McClelland and Winter (1969a) found that performance in concrete subjects like physics, chemistry, and mathematics improved amongst high school boys in India who had received achievement motivation training compared to those who did not. Highly-structured mastery courses in achievement motivation were more effective with girls compared to less-structured courses with boys (Alschuler, 1970). The investigator used a high-structure mastery course approach in the present study, but the investigator did not used an alternative course structure; therefore comparisons between boys and girls scores in the present study can not be made on the basis of course structure as was the case in the Alschuler (1970) study. Sid and Lindgren (1982), Basow (1986), and Piedmont (1988) found that males generally had higher achievement motivation gains than females, although those researchers studied young adults and not children. Gower, Cole and Phillips (1987), and Grabinger and Jonassen (1988) found no sex differences. Two studies (Inglehart & Brown, 1987) and (Inglehart, et al., 1987) concluded that gender differences in achievement motivation were not manifestations of degree of motivation but kind of values supporting motivation. Haynes, et al., (1988) in his study of black high school students, found higher achievement motivation scores from girls. In the present study, there was no significant difference between achievement motivation scores of grade four girls and boys in rural Southern Alberta. Therefore, the investigator was not able to reject the null-hypothesis that sex would have no effect on Gumpgookies scores.

Berens (1977) found a relationship between **nAch** and child rearing practices. She suggested the possibility of an optimal range of mastery demands for socialization of high **nAch**. She found that a balance of interaction and

support combined with controls, expectations and achievement demands were factors associated with various levels of **nAch** scores. Low **nAch** boys got inadequate support and too much control; in fact, they received significantly more control than positive interaction. Low **nAch** girls got support but no goals, standards or controls. Girls had more positive interaction than control. Balanced patterns of socialization--neither too much nor too little of interaction, controls, expectations, achievement demands--were evident amongst high **nAch** boys and girls. Berens concluded that the important factors appear to be expectations and demands for achievement and independence made at an appropriate age, in this sample around age 5, the age of school entrance, coupled with positive interaction or support and a moderate amount of control. (Berens, p. 2) These factors led to high **nAch** in both sexes suggesting that there might be an optimal pattern for socialization which produces gender general **nAch**. The present study did not address child rearing practices so it did not shed any new light on Berens' considerations.

Sid and Lindgren (1982) found a correlation between women's **nAch** scores and scores on the Strong Vocational Interest Blank and the California Psychological Inventory scales. Sid and Lindgren found this to be unexpected because most studies report nonsignificant findings for female subjects. They suggested that for women in comparison to men commitment to a high-status profession seems more likely to require a suppression of **nAff** in favour of **nAch**. The **nAch-nAff** scores correlated positively with GPA for both sexes. This also suggests that achievement motivation could be useful in affecting generic achievement gains. This suggests that achievement motivation training could be one means whereby teachers could ameliorate gender equity possibilities, which is certainly a solid reason for engaging in regular achievement motivation training. The present study did not deal with adult scores and so the investigator was not able to make connections between findings in the two studies.

Results were different for girls and boys; achievement motivation training had no significant effect on girls' participation in achievement related activities. Alschuler (1973) presented an important concept when he said that, even though the boys had learned a new achievement vocabulary and maybe could just talk a better game, the results are probably not only due to a desire by the boys to please the investigator. Achievement motivation training courses had demonstrable long term effects on achievement related activities outside the school. Alschuler's investigating effectiveness of achievement motivation training pointed up some important variables: age, sex, concreteness of subject matter, and degree of structure of the achievement motivation training. However, in the present study age and sex variables showed no significant difference, and this investigator did not test concreteness of subject matter, and degree of structure of the achievement motivation training.

The next question was family size. In the present study number of children in the family was found to be related to Gumpgookies scores. The average family size in our study was 4.955 (SD 2.33). Families with under five children were coded as "smaller"; others were coded "larger".

Family Size Effect

Table 5

T-Tests for Independent Samples of FAMILY SIZE

GROUP 1 - FAMILY SIZE EQ 1: SMALLER
GROUP 2 - FAMILY SIZE EQ 2: LARGER

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GUMPGOO2 post-test				
GROUP 1	32	60.47	7.71	1.36
GROUP 2	35	58.17	10.92	1.85

	Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
2.01	.05	.99	65	.33	1.00	61.21	.32

Table 5 shows that students from families with fewer than five children had significantly higher Gumpgookies scores than students from families with five or more children. These results support those found by Falbo and Richman (1977).

Next this investigator checked for interaction between achievement motivation and birth order. Birth order was the only variable which conformed to all the literature which was reviewed on achievement motivation (Sampson, 1962), (Kammeyer, Miller, & Mitchell, 1972), (Falbo & Richman, 1977), (Kliewer and Weidner, 1987), (Hall and Lee, 1981), (Polit and Falbo, 1987). First-born children in the present sample had significantly higher Gumpgookies scores ($p=.03$) than later born children. There were no only-children in the sample, so the investigator was not able to test for differences between only-children and siblinged children.

Birth Order Effect

Table 6

T-Tests for Independent Samples of BIRTH ORDER

GROUP 1 - BIRTHORD EQ 1: FIRSTBORN
GROUP 2 - BIRTHORD EQ 2: LATERBORN

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GUMPGOO2 post-test				
GROUP 1	13	63.00	6.89	1.91
GROUP 2	54	58.37	9.90	1.35

	Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
2.06	.17	1.59	65	.12	1.98	25.45	.06

On the question of birth order in the present study, first-born children had higher Gumpgookies scores, than later-born children. These findings concur with Sampson (1962), (Kammeyer, Miller, & Mitchell, 1972), (Falbo & Richman, 1977), (Kliewer and Weidner, 1987), (Hall and Lee, 1981), (Polit and Falbo, 1987), the investigator chose to examine interaction of **nAch** and, at least, family size and birth order. However, concurrent and conflicting findings are reported in Ernst and Angst (1983). They found that achievement motivation decreases as sibship size increases if background variables are not controlled. However, when background variables are controlled, sibship size alone explained only small amounts of the variations in achievement motivation. Ernst and Angst (1983) reviewed considerable literature on birth order and its correlates, and they reexamined important hypotheses with their own representative samples. They found that there is a negative correlation between sibship size and school achievement. "Firstborns show better school achievement than laterborns.

Youngest children achieve less than their elder sibs. School achievement is inversely related to birth order within sibship size. School achievement of single children is lower than that of firstborns. Single children show lower school achievement than children with sibs" (Ernst & Angst, 1983, p. 247). Relationships between birth order and achievement need require further research, particularly questions dealing with complexities surrounding sibship size. Since a significant relationship was indicated between Gumpgookies scores and birth order, the investigator concluded that it would be appropriate to reject null-hypothesis, that birth order would have no effect on Gumpgookies scores.

No significant effects were found for time spent in the community, distance from school, or computer use. Table 7 shows the statistics which relate to time spent in the community. The investigator included this variable to check whether a particular school context had an influence on **nAch**. Students new to a school could have carried over an influence from their previous school, and therefore might carry detectable differences in achievement motivation when compared to the rest of the students in their present school. The statistics did not support that notion.

Length of Residence Effect

Table 7

T-Tests for Independent Samples of TIMEHERE

GROUP 1 - TIMEHERE EQ 1: LESS THAN 4 YEARS
GROUP 2 - TIMEHERE EQ 2: 4 OR MORE YEARS

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GUMPG002 post-test				
GROUP 1	18	57.39	11.12	2.62
GROUP 2	49	59.96	8.89	1.27

	Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
1.56	.23	-.98	65	.33	-.88	25.43	.39

Distance from school was intended to check whether rural students (those who needed rides to school) were in any way different from the town students who were within walking distance of the school. The analysis showed no significant difference between groups.

Distance from School Effect

Table 8

T-Tests for Independent Samples of DISTANCE

GROUP 1 - DISTANCE EQ 1: WALK
GROUP 2 - DISTANCE EQ 2: RIDE

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GUMPGOO2 post-test				
GROUP 1	39	60.10	9.03	1.45
GROUP 2	28	58.11	10.22	1.93

	Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
1.28	.48	.84	65	.40	.83	53.75	.41

The investigator also wanted to know whether frequency of access to a computer would connect with achievement motivation. It did not.

Computer Use Effect

Table 9

T-Tests for Independent Samples of COMPUTER USE

GROUP 1 - COMP_USE EQ 1: AT LEAST WEEKLY
GROUP 2 - COMP_USE EQ 2: LESS THAN WEEKLY

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GUMPGOO2 post-test				
GROUP 1	49	59.90	8.60	1.23
GROUP 2	18	57.56	11.79	2.78

	Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
1.88	.09	.89	65	.38	.77	23.96	.45

There were no significant relationships between Gumpgookies scores and age, gender, family size, length of residence in the community, distance from school, or amount of computer use. With respect to these six variables the investigator concluded that it would be inappropriate to reject null-hypotheses 3, 4, 5, 7, 8, 9.

The tenth hypothesis was that rank in class would not be correlated with Gumpgookies scores. First the investigator used a T-Test to compare means of the top and bottom half of the class. Surprisingly, the top of the class had significantly lower (p=.03) Gumpgookies scores than the bottom of the class.

Rank in Class Effect

Table 10

T-Tests for Independent Samples of RANK IN CLASS

GROUP 1 - RANKINCL EQ 1: Top Half
GROUP 2 - RANKINCL EQ 2: Bottom Half

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GUMPGOO2 post-test				
GROUP 1	10	54.40	13.18	4.17
GROUP 2	10	63.90	6.81	2.15

	Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
3.75	.06	-2.02	18	.06	-2.02	13.48	.06

Since a significant relationship was indicated between Gumpgookies scores and rank in class, the investigator concluded that it would be appropriate to reject the null-hypothesis 10 that rank in class would not be correlated with Gumpgookies scores.

The questionnaire contained a question which asked students whether in a group they would prefer to be thought of as the boss (need power) the friend (need affiliation) or the winner (need achievement). The investigator coded "winner"as 1 and other answers 2. Only 12 students indicated that they would prefer to be a "winner" in a group. The mean Gumpgookies score of this small group was not significantly different from the rest of the sample. Therefore, the investigator failed to reject hypothesis 11.

Group Preference Effect

Table 11

T-Tests for Independent Samples of GROUP PREFERENCE

GROUP 1 - GROUPREF EQ 1: WINNER
GROUP 2 - GROUPREF EQ 2: OTHER

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GUMPGOO2 post-test				
GROUP 1	12	55.75	9.91	2.86
GROUP 2	55	60.04	9.35	1.26

	Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
1.12	.73	-1.42	65	.16	-1.37	15.57	.19

T-tests for independent samples of GROUPREF

GROUP 1 - GROUPREF EQ 1: FRIEND
GROUP 2 - GROUPREF EQ 2: OTHER

Variable	Number of Cases	Mean	Standard Deviation	Standard Error
GUMPGOO2 post-test				
GROUP 1	49	61.24	8.30	1.19
GROUP 2	18	53.89	10.75	2.53

	Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.	t Value	Degrees of Freedom	2-tail Prob.
1.68	.16	2.96	65	.004	2.63	24.85	.01

Oddly enough, when frequencies were tallied on this question, data indicated that 6 selected "boss", 49 selected "friend", and 12 selected "winner". It appears that students who self-reported high need for affiliation (they said they would prefer to be thought of as a "friend" in a group) had significantly higher

(P=.01) **nAch** scores in this sample. This phenomenon contradicts Lindgren (1976), Peterson and Roscoe (1986), and Gross (1989), all of whom indicated a **nAch-nAff** dichotomy. All of these researchers posited that it was uncommon to have high scores in both motives at once. There are several possible explanations for this apparent anomaly. First, stating their group preference is a self-report measure, and, hence, somewhat suspect. An objective assessment of need for affiliation was not used in this study. Second, student responses could have been influenced by the social desirability concept described by Feshbach and Weiner (1982). Third, one answer to a single subjective question should hardly be expected to generate an adequate assessment of a ubiquitous motive.

An answer to the question, whether students who were not already academically at risk would obtain different results from students in the deCharms and Alschuler studies, has not been fully answered. In this study, treatment effect was not measurable using Gumpgookies. Yet there was an interaction effect between Gumpgookies scores and rank in class. The lower half of the class had higher **bAch** scores. The Harvard researchers that **nAch** and school achievement might not be related because school was not challenging. Perhaps school *is* challenging for students in the bottom half of the class. Perhaps that could provide a partial explanation of why deCharms and Alschuler got results with their at-risk students and this investigator found a significant reciprocal relationship between Gumpgookies and rank in class.

Ten significant Pearson correlation coefficients emerged, six of them at the .05 level of significance and four at the .01 level. The investigator included them for comic relief at the end of a long paper because interpreting them was rather humorous. For example, family size and birth order were positively correlated ($r=.76$, $p<.01$). This means you can't be the fifth child born unless there were at

least five children in the family. Length of residence in the community was positively correlated with family size ($r=.30$, $p<.05$). This means that the longer you live in Stirling, Raymond, or Magrath the more likely you are to have a large family. Time in town was related to birth order ($r=.25$, $p<.05$). This only stands to reason because you can't be the fifth child unless there are at least five children, and you aren't likely to be from a family that big until you've lived in Stirling, Raymond, or Magrath for at least five years. Distance from school was negatively correlated with family size ($r=-.32$, $p<.01$), and birth order ($r=-.26$, $p<.05$). The big families live in town so it is more likely to be the fifth child if you live in town. Girls used the computer more than boys ($r=.27$, $p<.05$) and boys were more commonly in the top half of the class ($r=.29$, $p<.05$) so the more you used a computer the more likely you would be in the bottom of the class. Students from large families were more likely to be in the top of the class ($r=.24$, $p<.05$). Finally, the lower your rank in class the more likely you were to have a higher Gumpgookies pre-test score ($r=-.49$, $p<.01$). These statistics were included just for fun. They remind one of the balloonist who flew over some lost hikers. When they called up, "Where are we?", he answered, "Down there." And when they called, exasperated, "Where are *you*?", he answered, "Up here." The answers were perfectly true and perfectly useless.

Summary

Grade four students in rural Southern Alberta did not obtain significantly higher Gumpgookies (achievement motivation) scores following four weeks of achievement motivation training modelled after Alschuler and deCharms. However, statistical analyses indicated significant interactions of Gumpgookies scores with birth order, and rank in class.

McClelland demonstrated repeatedly that adult business people could develop achievement motivation. Alschuler and deCharms found that classroom treatment procedures could yield increased student achievement motivation. The purpose of this study was to investigate the extent to which treatment activities could foster achievement motivation in a sample of rural Southern Alberta grade four students. To accomplish this, the investigator employed a combination of the methods used by Alschuler with adolescents, and deCharms with younger students. The treatment group experienced achievement motivation action strategies, conceptualized achievement motivation thoughts, related the achievement motivation syndrome to three areas of personal life, and practised what they learned. Two control groups were grade four classes in rural Alberta; one received pre- and post-tests, the other the post-test only. The investigator used the Gumpgookies to quantify achievement motivation.

Research studies from the literature on achievement motivation, indicated that teachers can teach, increase, train, and foster achievement motivation. Business people had the most effective results. Effects of achievement motivation training become less effective as the age, experience and developmental level of the subjects decreases. However, researchers have shown that achievement motivation training has been effective with pre-school youngsters, and no writer suggested that achievement motivation training would be either harmful or completely unjustified by the law of diminishing returns. The literature on fostering achievement motivation indicated that researchers have fostered achievement motivation in adults, high school students, St. Louis fifth grade to high school inner-city students, and pre-school students. Further, effectiveness of achievement motivation training seems to be related to developmental level of subjects. In fact, McClelland predicted that it might be ineffectual with subjects younger than high-school age. However, later successful treatment results were

found in pre- school, and upper elementary students, which contradicted McClelland's earlier hypothesis. Results of the present study concur with McClelland.

In the Purpose section (in Chapter 1) of this thesis, the investigator posed three main research questions. This study has provided answers (albeit tentative) to these questions. First, can a teacher significantly increase **nAch** in rural Southern Alberta grade four students? Using the Alschuler's and deCharms' methods, and measuring achievement motivation with Gumpgookies, it appears that the answer is "no". Second, what method(s) is/are most effective in fostering achievement motivation? Although the literature indicated that Alschuler's and deCharms' methods would be most effective, the measurement instrument was unable to detect significant change in Gumpgookies scores after treatment. We did not answer the question directly. We only found out that Alschuler's and deCharms' methods may *not* be the best, or that the measurement instrument was not sufficiently sensitive for our sample. Third, what correlations might exist between achievement motivation scores and other standard cross variables such as age, gender, family size, and birth order? In the treatment group, Pearson Correlations showed that Gumpgookies scores were related to age, family size, birth order, and rank in class. Younger students had higher scores. Students from families with fewer than five children had higher scores than children from families with five or more children. Early born children had higher scores than later born children, especially when split by first born and later born. Children in the top half of the class had lower Gumpgookies scores than children in the bottom half of the class. The two control groups showed no significant correlations between Gumpgookies scores and any demographic variables. Town students had no advantage over bus students. Students who were not "turned off" to education did not significantly change Gumpgookies scores after treatment.

On the basis of the results of this study, the investigator failed to reject null-hypotheses 1, 2, 3, 4, 5, 7, 8, 9 and 11 (treatment effect, practice effect, age, gender, family size, length of residence, distance from school, access to a computer, and group preference), but was justified in rejecting null-hypotheses 6, and 10 (birth order, and rank in class).

Recommendations for Further Research

1. White and Mouw (1976) found **nAch** to be an equal or better predictor of reading achievement than IQ. The present investigator feels that White and Mouw (1976) uncovered an important observation which should be replicated in future research.

2. Carr and Mednick (1988) suggested that, since their data were verified by three separate measures, future researchers in achievement motivation studies should also use several measures of **nAch**. An obvious future study would be to replicate the present study with a battery of more sensitive measures of **nAch**.

3. According to Parker and Johnson (1981) we should be concentrating our research efforts on some age of pre-schooler. White's twenty-eight years of research on child development (1979, 1988) led him to believe that children establish their intellectual and emotional proclivities by three years old. This points to possible future research to see at what age achievement motivation becomes established.

4. Regarding family context variables of birth order, family size, gender, first-born children in the present study, and in the literature, generally had higher Gumpgookies scores than later-born children. It would appear that research is required to see what conditions can increase achievement motivation in later- born children, and

children from large families. Also, what factors account for gender differences in achievement motivation, and what can be done for children who are not the favoured gender. Certainly Piedmont's study investigating gender and fear of success will need to be replicated as societal values change. Research could possibly show whether Piedmont's **nAch-FOS** relationship and Lindgren's **nAch-nAff** relationship are different facets of the same phenomenon.

5. As we study why achievement motivation and correlative achievement are not more consistently related to academic performance--to grades in school, or to scores on tests of academic talent, (McClelland, 1972) we may find it valuable to test hypotheses relating to interaction between achievement motivation and self-efficacy.

6. Since, in terms of rank in class, the bottom half of the treatment class had significant increases in **nAch** scores, future studies may indicate whether achievement motivation training would be useful in special education or resource room settings.

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Appendices

Appendix A: Course Outlines--deCharms & Alschuler

The investigator in the present study included deCharms' course outline so that the reader can ascertain the congruity between it and the course outline of the present study. The idea was to replicate the spirit and concepts of the deCharms course since the deCharms course yielded significant changes in achievement motivation scores.

Day 1. My goals in life.
Day 2. We must be aware of ourselves.
Day 3. My goals for today.
Day 4. Check on progress.
Day 5. My goals for the weekend.

Day 6. Check on progress over the weekend.
Day 7. Training to be an Origin.
- a. Personal responsibility
- b. Prepares
- c. Plans
- d. Practises
- e. Persists
- f. Patience
- g. Performs
- h. Progress
- i. Perfecting

Day 8. Is it good to be an Origin?
Day 9. Looking at an Origin.
Day 10. Being an Origin over the weekend

Day 11. Checking our progress.
Day 12. Treating others as pawns.
Day 13. The experience of being a pawn.
Day 14. Treating others as Origins.
Day 15. The experience of being treated as an Origin.

Day 16. What I can't do.
Day 17. What I can be and do.
Day 18. Goal Sheet.
Day 19a. Examination of the importance of my goals to me.
Day 19b. Examination of my present ability to reach each goal.
Day 20. My goals for the vacation.

Day 21. Checking my progress over the vacation.
Day 22a. Acknowledging the source of blocks.
Day 22b. Reducing personal and other blocks.
Day 23. To get a goal--review and preparation.
Day 24. To get a goal--achievement plan.
Day 25. Checking our progress. Folding up.

The investigator in the present study included the following Mastery Oriented **nAch** Course Contract Scheme which was Alschuler's course outline. Each unit represents one week of the course. The reader may note that the course outline for the treatment group in the present study is a combination of deCharms' and Alschuler's outlines, but mostly like the Alschuler outline.

Mastery Oriented **nAch** Course Contract Scheme (Alschuler, 1971, p. 197)

I. **nAch** Action Strategies (**experience**)
To learn to recognize and use four **nAch** action strategies:
1. realistic goal setting
2. proper use of feedback
3. taking personal responsibility
4. researching the environment

II. **nAch** Thoughts (**conceptualize**)
To learn the ten **nAch** thoughts and the goal-setting patterns they form
To relate these to the action strategies

III. Self Study (**relate**)
To have the student relate **nAch** syndrome to three areas of the student's own life
1. reality demands
2. self-image and personal goals
3. values of groups and culture to which he belongs.

IV. Goal Setting (**practice**)
To have the student actually apply what the student has learned to a personal achievement goal.

Appendix B: Course Outline--Present Study

Following is the course outline from the Present Study

Monday, May 7 - Thursday, June 7, 1990

Day 1 Gumpgookies pre-test
Day 2 Setting Reasonable Goals (Origami Game)
Day 3 Origami Game
Day 4 Chicken and Dare Errors
Day 5 We can set meaningful goals in our own lives.

Day 6 Proper Use of Feedback (Pebble Toss Game)
Day 7 Group Pebble Toss
Day 8 Group Pebble Toss
Day 9 Setting Reasonable Goals (Theory)
Day 10 Group Pebble Toss

Day 11 Victoria Day
Day 12 Taking Personal Responsibility (Darts Dice Game)
Day 13 Darts Dice Game
Day 14 Darts Dice Game
Day 15 Friday May 25, 1990

Day 16 The Ten Ideas
Day 17 What is and is not Achievement Imagery
Day 18 Writing real AIMs
Day 19 The **nAch** Match Game
Day 20 The Goal Setting Pattern

Day 21 The Goal Setting Pattern
Day 22 The Origin- Pawn Concept
Day 23 Achievement Motivation Summary
Day 24 Gumpgookies post-test

Following is a transcript of the notes from a treatment group student log book which shows details of daily treatment activities.

Week One

Day 1 Monday May 7 1990
Gumpgookies

Day 2 Tuesday May 8 1990
Setting Reasonable Goals

I learned how to do origami.
Goal_____ Did_____.

Day 3 Wednesday May 9 1990
I learned how to fold paper mushrooms.
Goal_____Did_____.

Day 4 Thursday May 10 1990

CHICKEN	REASONABLE	DARE
ERROR	GOAL	ERROR

As I made mushrooms, I found out how many I could make in six minutes. Now I can set a high but not unreasonable goal.
Goal_____Did_____.

Day 5 Friday May 11 1990
We can set meaningful goals in our own lives.

1. Set
2. Write
3. Say
4. Picture
5. Do

My goal for the weekend is to (action) (number) times.
Goal_____Did_____.

Week Two

Proper Use of Feedback

Day 6 Monday May 14 1990

I am going to throw pebbles from the nine point line into a bucket.
_____ line _____
_____ line _____
_____ line _____
I learned not to make a chicken error or a dare error. If I stand too close, I make more pebbles but fewer points. If I stand too far back, I don't make as many pebbles but more points per pebble. I should stand where it is reasonable for me.

Day 7 Tuesday May 15 1990

Group Pebble Toss

Goal _____ point line _____ points
Did _____ points
Goal _____ point line _____ points
Did _____ points

Day 8 Wednesday May 16 1990

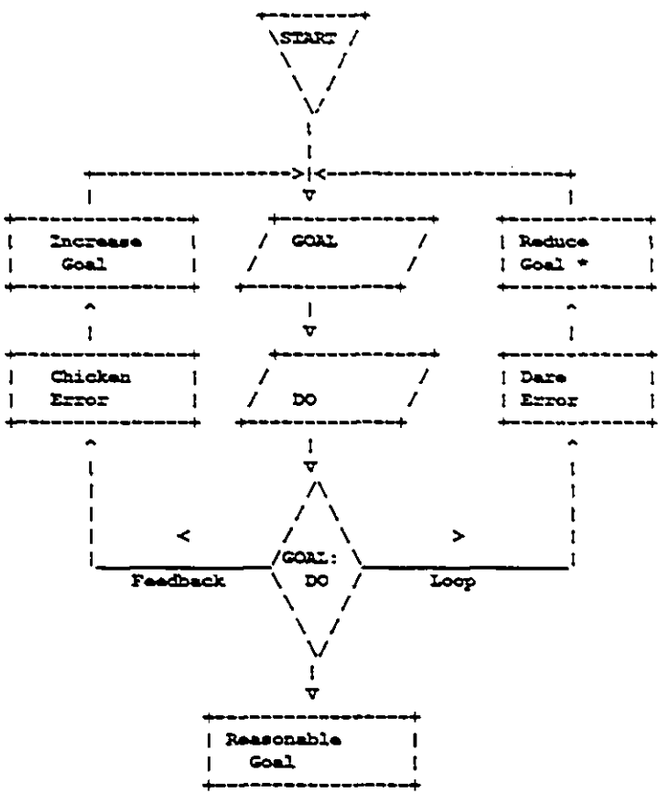
Group Pebble Toss

Goal _____ point line _____ points
Did _____ points

Day 9 Thursday May 17 1990

The following diagram is a schematic representation of the method to determine reasonable goals by means of a feedback loop.

Figure 2. Feedback Loop to Determine a Reasonable Goal



* Feedback enables us to set reasonable goals. Goal reduction is one answer to a dare error. Also consider:

1. Practice
2. Training

Doing things gives us feedback and helps us know what is a reasonable goal.

Goal _____ point line _____ points

Did _____ points

Day 10 Friday May 18, 1990

Feedback in pebble toss teaches that we can get more points as a group if we individually set reasonable goals.

Week Three

Taking Personal Responsibility

Day 11 Monday May 21, 1990

Victoria Day

Day 12 Tuesday May 22, 1990

The Darts Dice Game

Leaving my life up to chance is like playing a game with dice. Using a dart, my success depends more on my skill than chance.

Day 13 Wednesday May 23, 1990

You can get to 100 faster throwing darts than rolling dice if you are a skilful dart thrower.

Day 14 Thursday May 24, 1990

	WIN	LOSE
DARTS	YES	
DICE		

Darts is usually better than dice because you can aim in darts.

Day 15 Friday May 25, 1990

Nine games played: darts won 7 dice won 2.

In life, people who improve their skills can usually succeed more often than people who leave their lives to chance. Get training. Practise. You will improve your chances. Depending on skill is better than depending on chance. Of the twenty-three games we played, darts won twenty-two times; dice won once. Skill is more reliable than chance.

Week Four

Day 16 Monday May 28, 1990

The Ten Ideas
1. AIM (Acronym for Achievement IMagery)

2. Need NEED
3. Success Feelings SuF
4. Failure Feelings FaF
5. Hope of Success HOS
6. Fear of Failure FOF
7. Personal Obstacles PO
8. World Obstacles WO
9. Actions ACT
10. Help HELP

1. Unique accomplishment

2. Improvement

3. Friends

4. Being best at something

5. Being in charge of something

6. Finishing some task

7. Sticking at a difficult task for a long time

The teacher underlined examples of Achievement imagery.

Day 17 Tuesday May 29, 1990

Achievement Aims

What is AIM? (Striving for Excellence)

1. Competing with self (CS)

2. Competing with others (CO)

3. Trying to accomplish something unique (UA)

4. Developing skills through some long-term involvement (LTI)

What is not AIM?

- Task Imagery
- Affiliation Imagery
- Power Imagery
- Material Gain

Grade four wrote up any aim and detailed the nine other thoughts.

Day 18 Wednesday May 30, 1990

We wrote up a real AIM following Achievement Imagery criteria--CS, CO, UA, LTI

Day 19 Thursday May 31, 1990

The **nAch** Match Game
We matched phrases with their ten associated ideas.

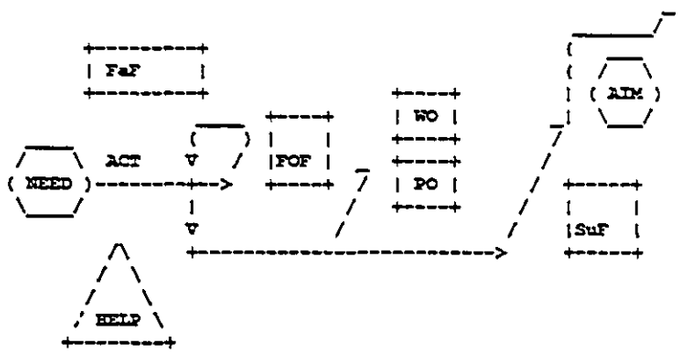
1. AIM
2. Need
3. SuF
4. FaF
5. HOS
6. FOF
7. PO
8. WO
9. ACT
10. HELP

Day 20 Friday June 1, 1990

We wrote up a second AIM and passed it off with the teacher. We diagrammed the goal setting pattern.

Figure 3. Diagram of the Goal Setting Pattern

After Alschuler (1971)



Week Five

Day 21 Monday June 4, 1990

If your mind can conceive it,
And your heart can believe it,

Then your brain can achieve it.

Day 22 Tuesday June 5, 1990
Origin Pawn Concept

An Origin:

1. Takes Personal Responsibility
2. Prepares Work Carefully
3. Plans life to reach goals
4. Practises Skills
5. Persists in Work
6. has Patience
7. Performs actions to reach goals
8. checks Progress
9. moves towards Perfecting skills

Most people like to choose for themselves rather than have others tell them everything. A pawn gets pushed around and has the least power.
An origin acts independently.
Day 23 Wednesday June 6, 1990

Achievement Motivation Summary

Activity	What We Learned
Origami Game	Set Reasonable Goals (Chicken/Dare Errors)
Pebble Toss	Proper Use of Feedback
Darts/Dice Game	Taking Personal Responsibility
10 Thoughts	What Achievers Think
nAch Match Game	Practise Learning Thoughts
AIM Game	Identify Achievement Imagery
Diagram Goal Setting Pattern	We Must ACT on our ideas
Origin Pawn	Origins choose and act independantly

Day 24 Thursday June 7, 1990
Gumpgookies post-test

Appendix C: Copies of Permission Letters

CONCENT LETTER

Dear Parent or Guardian:

I am conducting a study of achievement motivation. The purpose of this study is to investigate to what extent achievement motivation can be increased in rural southern Alberta Grade four students. I anticipate that your child will benefit from participation in this study by becoming familiar with concepts and procedures which, in similar studies, have been shown to increase achievement motivation. I would like your permission for your child to participate in this study.

As part of this research your child will be asked to experience achievement motivation action strategies, conceptualize achievement motivation thoughts, relate the achievement motivation syndrome to three areas of personal life, and practise what is learned. Please note that all information will be handled in a confidential and professional manner. When responses are released, they will be reported in summary form only. Further, all names, locations and any other identifying information will *not* be included in any discussion of the results. You also have the right to withdraw your child from the study without prejudice at any time.

If you choose to do so, please indicate your willingness to allow your child to participate by signing this letter in the space provided below, and return the letter to the school with your child.

I very much appreciate your assistance in this study. If you have any questions please feel free to call me at home or school (Home 756-3458, School 756-3355). Also feel free to contact any member of the Faculty of Education Human Subjects Research Committee if you wish additional information. The Chairperson of the Committee is Doctor N. C. Grigg.

Yours sincerely,

Jim Hillyer

Jim Hillyer, Stirling School 756-3355

(Please detach and forward the signed portion)

FOSTERING ACHIEVEMENT MOTIVATION

I agree to allow my child,_____, to participate in this study.

_____ _____
Name Signature

_____
Date

[illegible]

[illegible]

[illegible]

I agree to allow [illegible] participate in this study.

Name _____ Signature _____

Position _____ Date _____

(Please forward the signed portion)

FOSTERING ACHIEVEMENT MOTIVATION

I agree to allow one Grade four class in my jurisdiction to participate in this study.

SAM HUXLEY
Name

SUPERINTENDENT OF SCHOOLS
Position

Stirling School
Stirling School Dist. 647

[signature]
Signature

March 28, 1990.
Date

(Please forward the signed portion)

FOSTERING ACHIEVEMENT MOTIVATION

I agree to allow one Grade four class in my jurisdiction to participate in this study.

John R. Hickson
Name

John R. Hickson
Signature

Principal
Position

April 2 1990
Date

Stirling School
Stirling School Dist. 647

(Please forward the signed portion)

FOSTERING ACHIEVEMENT MOTIVATION

I agree to allow one Grade four class in my jurisdiction to participate in this study.

John Waddell
Name

John Waddell
Signature

County of Warner No. 5
Position

May 7, 1990
Date

(Please forward the signed portion)

FOSTERING ACHIEVEMENT MOTIVATION

I agree to allow one Grade four class in my jurisdiction to participate in this study.

DEL OLSEN
Name

Del Olsen
Signature

PRINCIPAL
Position

Mar 24/90
Date

(Please forward the signed portion)

FOSTERING ACHIEVEMENT MOTIVATION

I agree to allow my one Grade four class in my jurisdiction to participate in this study.

Darrel E. Nelson
Name

Darrel E Nelson
Signature

Grade 4 Teacher
Position

Apr 23/90
Date

(Please forward the signed portion)

FOSTERING ACHIEVEMENT MOTIVATION

I agree to allow one Grade four class in my jurisdiction to participate in this study.

Neil Nordquist
Name

Neil Nordquist
Signature

Principal
Position

April 23, 1990
Date

(Please forward the signed portion)

FOSTERING ACHIEVEMENT MOTIVATION

I agree to allow my one Grade four class in my jurisdiction to participate in this study.

Lance Harker
Name

Signature

Grade Four Teacher
Position

April 23, 1990
Date

Magrath School

CONSENT LETTER

Dear Madam:

I am conducting a study of achievement motivation. The purpose of this study is to investigate to what extent achievement motivation can be increased in rural southern Alberta Grade four students. I anticipate that students in one of your classrooms will benefit from participation in this study by becoming familiar with concepts and procedures which, in similar studies, have been shown to increase achievement motivation. I would like your permission for one grade four classroom in your jurisdiction to participate in this study.

As part of this research students will be asked to act as a control group and would respond to a short oral individually-administered scale to obtain post-test measurements of achievement motivation. Please note that all information will be handled in a confidential and professional manner. When responses are released, they will be reported in summary form only. Further, all names, locations and any other identifying information will not be included in any discussion of the results. Parents will be contacted with individual letters of consent and will be informed that they have every right to withdraw their child from the study without prejudice at any time.

If you choose to do so, please indicate your willingness to allow one classroom in your jurisdiction to participate by signing this letter in the space provided below, and return the letter to the the Faculty of Education Human Subjects Research Committee, Faculty of Education, University of Lethbridge.

I very much appreciate your assistance in this study. If you have any questions please feel free to call me at home or school (Home 756-3458, School 756-3355). Also feel free to contact any member of the Faculty of Education Human Subjects Research Committee if you wish additional information. The Chairperson of the Committee is Doctor N. C. Grigg. Doctor M. Winzer is the Supervisor of the Thesis Committee.

Yours sincerely,

_____

Jim Hillyer, Stirling School 756-3355

M. A. Hillyer

Appendix D: Copy of the Questionnaire

Questionnaire:

Number of children in family 05

Your order of birth 03

Number of children living at home 05

How long have you lived in Magrath, Raymond, Stirling?

10 complete years

__ __ additional months

How far do you live from the school? 3 mile

How do you usually get to school? School

In a group would you rather be the boss? _____
the friend? ✓
the winner? _____

Why? Because if you where the boss no one would like you. So I am going to be a friend.

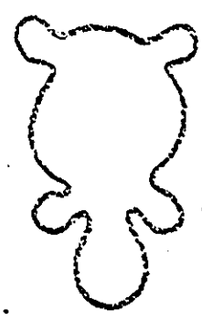
Check how often you get to use a computer. Make only one check.

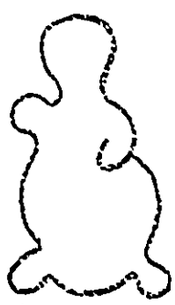
9 ____ several times \
8 ____ once }-- per -- day
7 ✓ less than once/

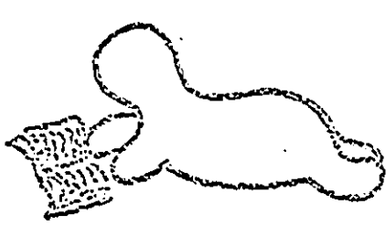
6 ____ several times \
5 ____ once }-- per -- week
4 ____ less than once/

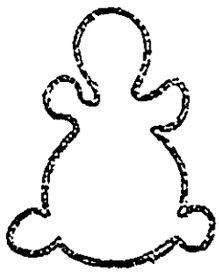
3 ____ several times \
2 ____ once }-- per -- month
1 ____ less than once/

Appendix E: Gumpgookies, Scoring Key and Manual

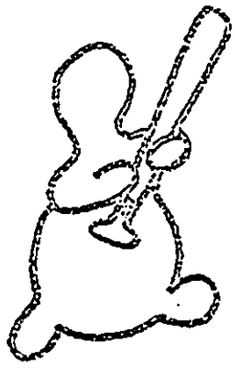


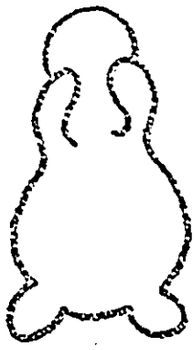


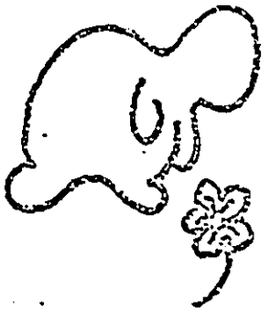




Did you know that around us live little Gumpgookies? They all look just alike, but they do different things. They laugh and play and work just like boys and girls. Everyone has his own Gumpgookie.





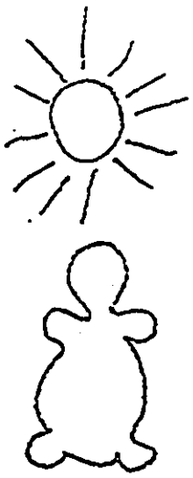


You have your very own Gumpgookie.
It looks like other Gumpgookies but
it does only what you do.

Will you help me find your Gumpgookie?
Look at each pair of Gumpgookies and
mark an X on the Gumpgookie <u>that</u>
<u>follows you and does what you do</u>.

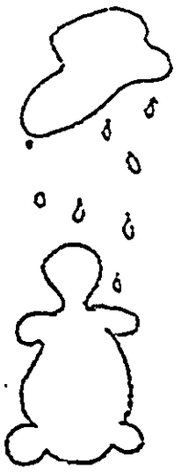
Remember, if you jump, it will jump,
And if you don't like to jump, it
won't like to jump.

Mark your own Gumpgookie in each
picture.

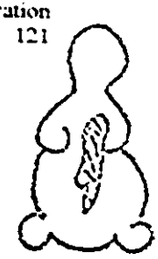


This Gumpgookie likes sunshine.

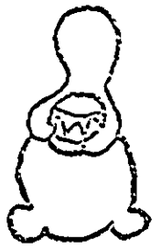
vi



This Gumpgookie likes rain.



This Gumpgookie plays with a stick.



This Gumpgookie plays with a ball.

vii

This Gumpgookie likes songs.

This Gumpgookie likes cats.

viii

This one likes dogs.

This Gumpgookie likes stories.

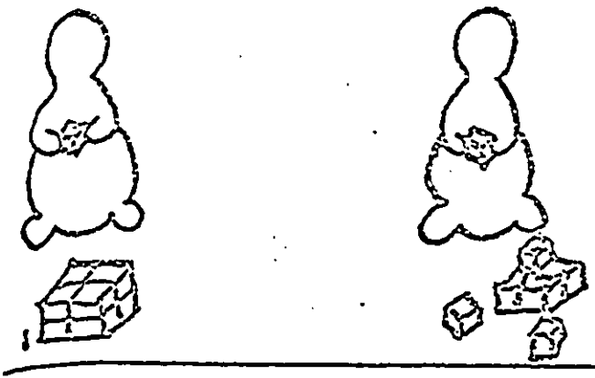
ix

Go on to the next page.

These Gumpgookies are building houses.

This one's house is almost finished.

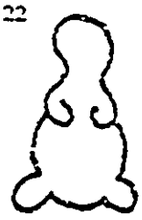
This one's house fell down.



1

Today--

Something bad will happen to this Gumpgookie.

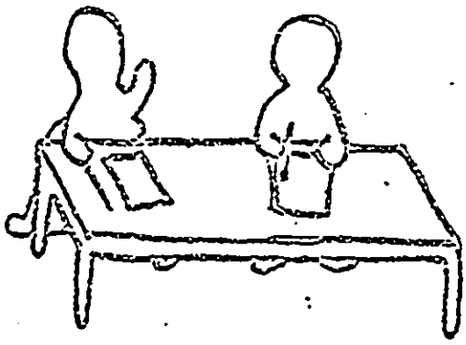


Something good will happen to this Gumpgookie.

2

This Gumpgookie wants someone to help write its name.

This Gumpgookie writes its name with no help.



3

This one likes to be at school.

This one likes to stay at home.

4

Teacher asked these Gumpgookies to do something.

This one will do it.

This one will forget to do it.

5

Go on to the next page.

This Gumpgookie tries to do things well.

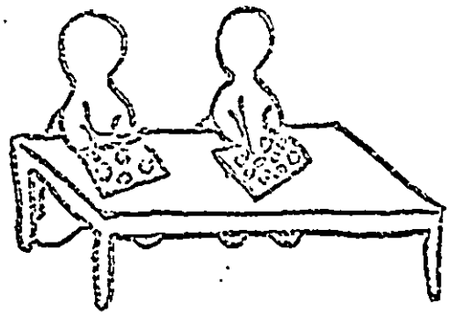
This one doesn't care.

6

These Gumpgookies are drawing circles.

This one is getting them right.

This one is drawing a lot.



7

This Gumpgookie will win someday.

This Gumpgookie will never win.

8

These Gumpgookies have some work to do.

This one is looking around.

This one is working.

9

These Gumpgookies both go to school.

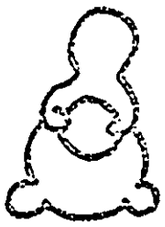
This one's mother makes it go.

This one wants to go to learn.

Go on to the next page.

This one drops the ball.

This one catches it.



11

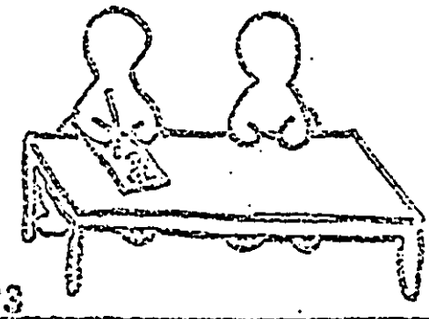
Learning to count makes this one feel good.

Learning to count makes this one feel bad.

12

This Gumpgookie is trying to write.

This Gumpgookie is watching.



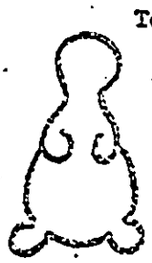
13

This one likes to play all the time.

This one likes to learn.

14

Teacher is reading a story.



This one stays to hear it all.

This one goes outside.

15

Go on to the next page.

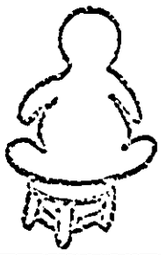
This Gumpgookie learns one new thing.

This Gumpgookie learns lots of new things.

16

These Gumpgookies lost their paintings.

This one is making another painting.



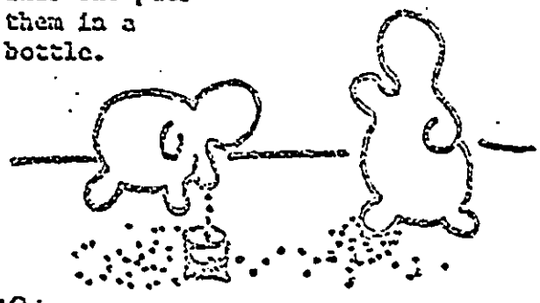
This one is sitting down.

17

These Gumpgookies see some ants in the dirt.

This one puts them in a bottle.

This one steps on them.



18

This one plays with things.

This one helps the teacher.

19

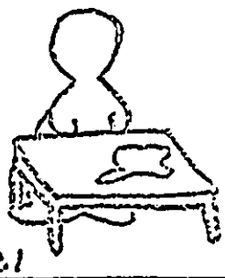
Teacher knows what this one is doing.

Teacher doesn't know what this one is doing.

Go on to the next page.

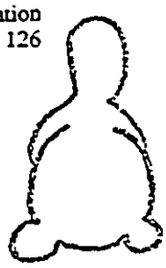
Sometimes cleaning up at school isn't fun.

This one stops.

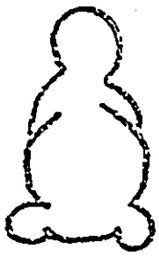


This one works anyway.

21



This is one of the Gumpgookies in the class.



This is the best Gumpgookie in the class.

22

It is time for Gumpgookies to tell stories.

This one has a story to tell.

This one doesn't know any story to tell.

23

Teacher is showing the Gumpgookies how to do something.

This one is watching carefully.

This one is looking around.

24

Teacher said there is no prize for the winners.

This one stopped trying to win.

This one kept trying.

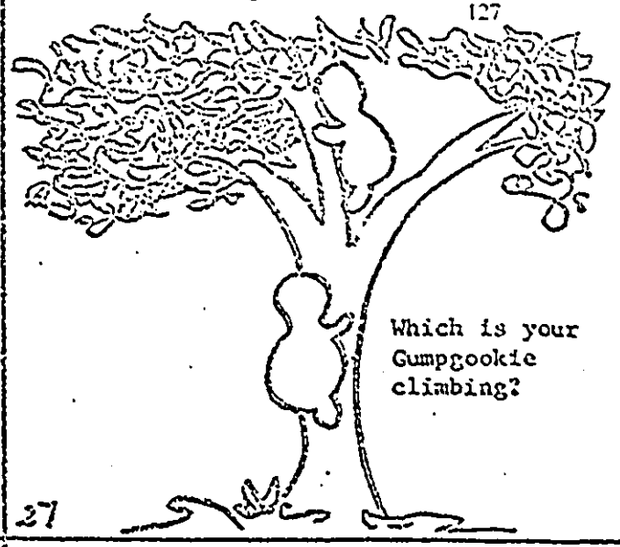
25

Go on to the next page.

This Gumpgookie doesn't like school.

This Gumpgookie does.

26



Which is your Gumpgookie climbing?

27

This one does its best when someone is watching.

This Gumpgookie always does its best.

28

This one likes to tell stories.

This one likes to listen.

29

These Gumpgookies are playing a game.

This one stops and rests.

This one keeps on playing.

Go on to the next page.

This one hides its paintings.

This one shows its paintings to others.

31

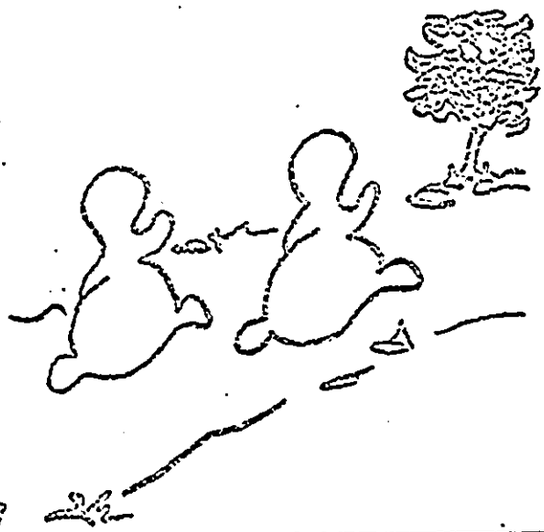
Teacher is unhappy with the Gumpgookies.

This one thinks teacher is wrong.

This one thinks teacher is right.

32

Which is your Gumpgookie running to the tree?



33

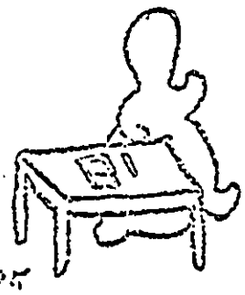
This one tells mother what it does in school.

This one forgets.

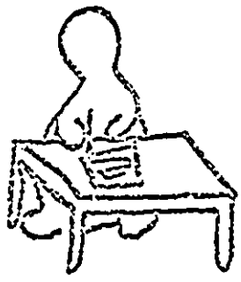
34

These Gumpgookies could not write their names.

This one gave up.



This one tried again and again.



35

Go on to the next page.

This Gumpgookie doesn't show mother the things it makes.

This Gumpgookie does.

36

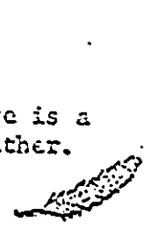
These Gumpgookies have lots of things.

This one doesn't bring them to school.

This one does.

37

Here is a feather.

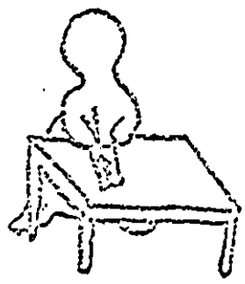


This Gumpgookie doesn't look at it.

This one wants to see the bird it came from.

38

Which is your Gumpgookie drawing pictures to show what it can do?



39

This one has lots of things to do.

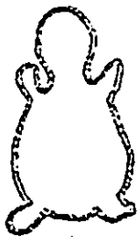
This one doesn't have anything to do.

40

Go on to the next page.

This one likes the house it has.

This one wants to build a prettier house.



41

This one is doing well in school.

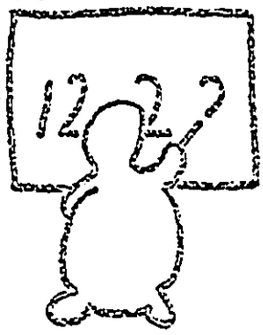
This one wants to do well in school.

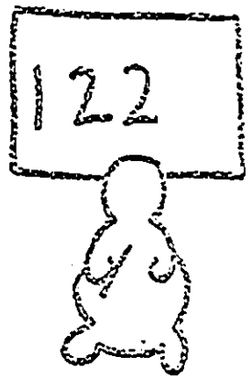
42

Teacher thinks this one can do a little better.

Teacher thinks this one can't do any better.

43





Writing numbers isn't easy.

This Gumpgookie keeps trying.

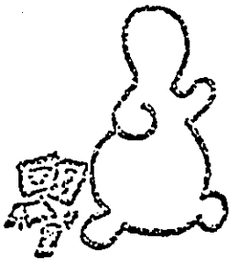
This Gumpgookie stops trying.

44

This Gumpgookie keeps the things it makes.

45

This one can't find its things.



Go on to the next page.

This Gumpgookie does what it wants to.

This Gumpgookie does things well.

46

This Gumpgookie has rich friends.

This Gumpgookie has smart friends.

47

It's playtime--

This one is watching teacher drawing.

This one is watching others playing.

48

Teacher asked: "Who can tell what this story is about?"

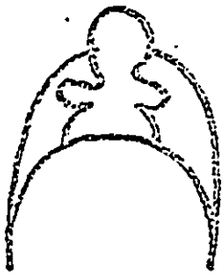
This one can't.

This one can.

49

Here are two Gumpgookies getting up in the morning.

This one thinks it will be a bad day.



This one thinks it will be a good day.

50

Go on to the next page.

These Gumpgookies both lost the race.

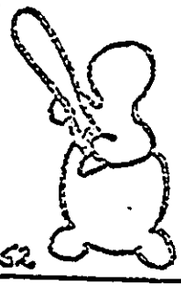
This one will win tomorrow.

This one will lose again tomorrow.

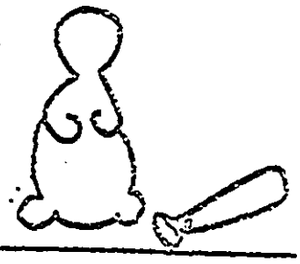
S1

These Gumpgookies want to play ball well.

This one tries to hit the ball.

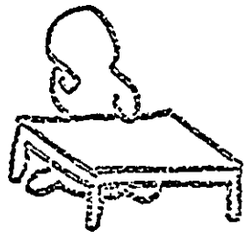


This one will try later.

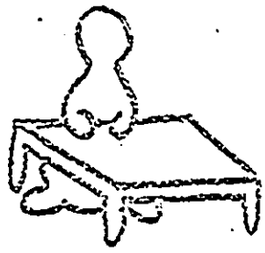


S2

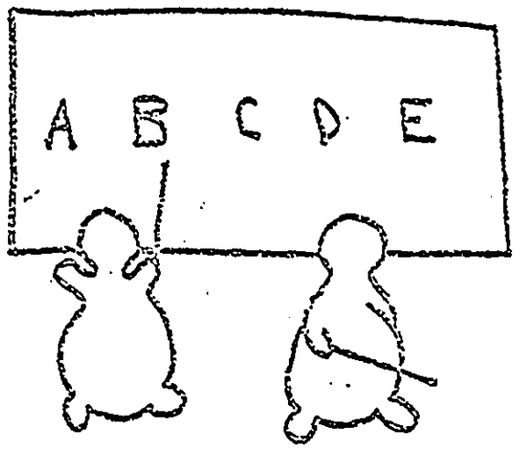
This one is tired of school.



This one isn't tired.



S3



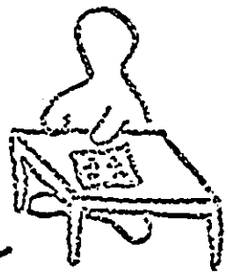
This Gumpgookie can point to the letter B.

This Gumpgookie thinks all letters look the same.

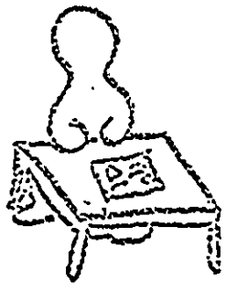
S4

These Gumpgookies are working.

This one wants to stop now.

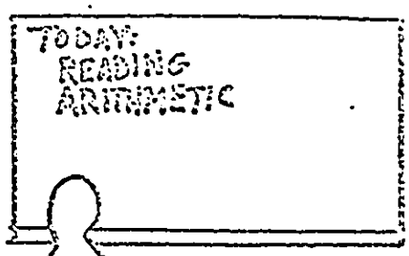


This one wants to work a little longer.



S5

Go on to the next page.



This is the board where teacher shows what the Gumpgookies will do in school today.

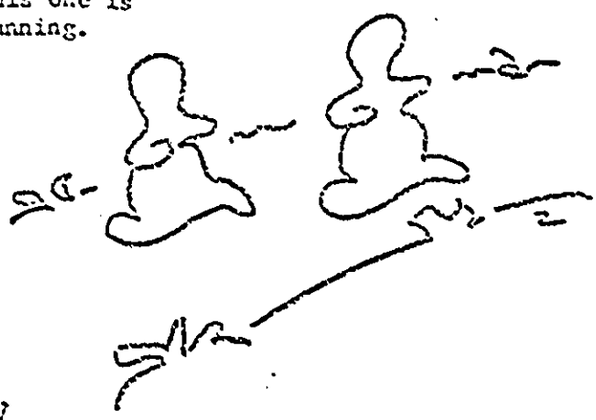
This one looks at it.

This one doesn't look at it.

56

This one is running.

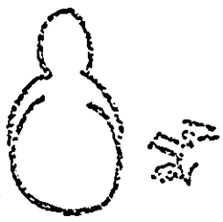
This one is winning.



57

These Gumpgookies should be looking at books.

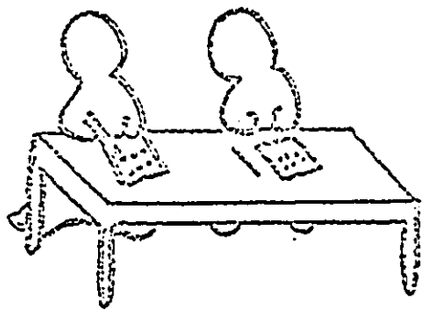
This one is playing.



This one is reading.

58

These Gumpgookies are learning to count.



This one is getting smarter.

This one is getting tired.

59

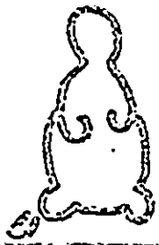
This one wants to be leader of the country.

This one wants to be king of the world.

60

Go on to the next page.

This one likes teacher.



This one doesn't.

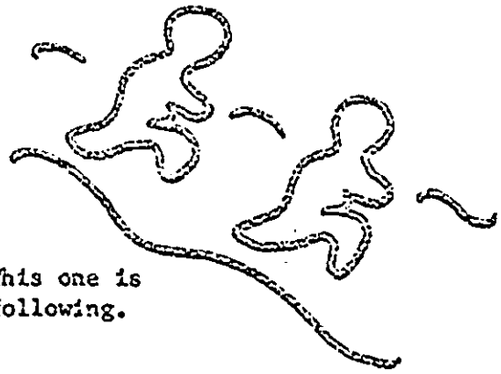
61

This Gumpgookie wants someone to read stories to it.

This Gumpgookie wants to read stories itself.

62

These Gumpgookies are playing "follow the leader."



This one is following.

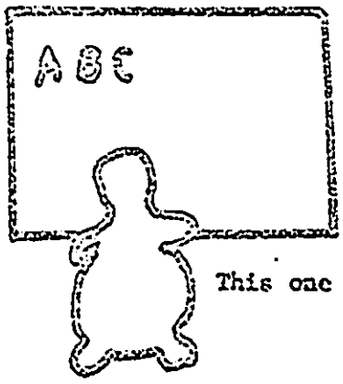
This one is leading.

63

This one needs help getting dressed.

This one dresses itself.

64



These Gumpgookies are playing school.

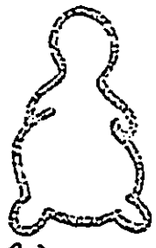
This one is the teacher.

This one is in the class.

65

Go on to the next page.

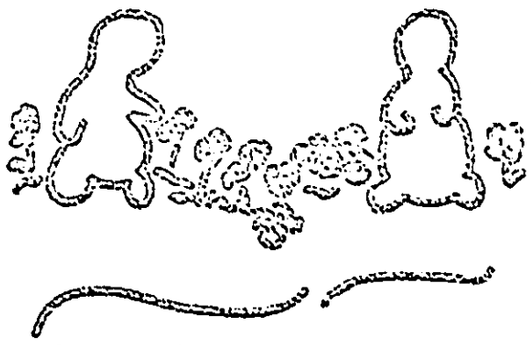
This one knows when its work is good.



This one doesn't know when its work is good.

66

These Gumpgockies have just learned to count.



This one is counting flowers.

This one is looking around.

67

This one thinks school is fun.

This one is tired of school.

68

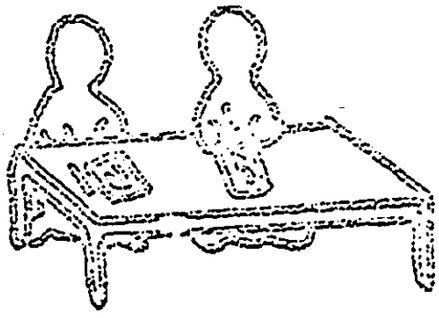
This one jumped over the stick.

This one fell down.

69

This one doesn't want its name on its paper.

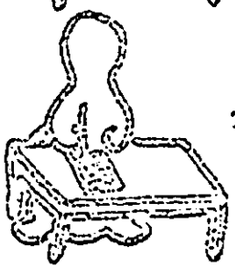
This one wants its name on its paper.



70

Go on to the next page.

This one is just starting its work.

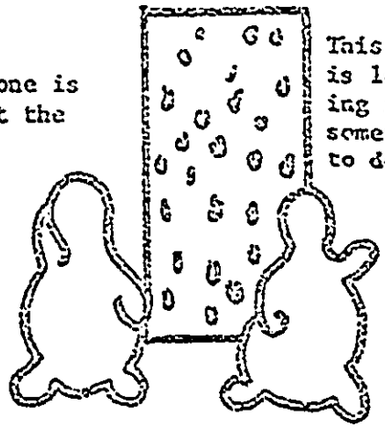


This one is almost done.

90

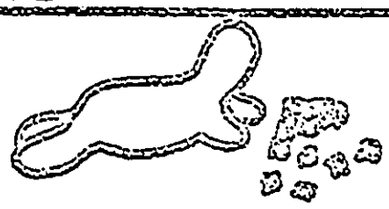
It is raining.

This one is mad at the rain.



This one is looking for something to do.

92



Which is your Gumpgookie spelling?

94

Which is your Gumpgookie putting a puzzle together?

96

This one is trying a new dance.

This one is doing an old dance.

98

Instructions for Administration of Gumpgookies (February, 1970)

Individual Form for Preschoolers
Group Form for Non-readers
Group Form for Readers

Examiners

It is recommended that the examiner have had experience in working with young children. Although experience in individual testing is not prerequisite, it is highly desirable. Some background in education or psychology is greatly preferred. The essential requirement for all examiners is that they be able to establish good testing rapport with the child or group. In no instance should the test be administered by a child's teacher, his mother, or any other person who has frequent contact with him or the class. Inasmuch as the effects of male examiners have not yet been investigated (only female examiners having been used up to the present time), it is recommended that for the time being only female examiners be employed.

Training examiners to use Gumpgookies can be accomplished in three to four hours and should include a discussion of

administration procedures as well as two or three trial runs.

Individual Form for Preschoolers

Procedures. The examiner should first establish a friendly interaction and good testing rapport with the child. The test should be administered in a quiet room with only the examiner and the child present. Two chairs should be placed at one side of a table so that the examiner sits next to the child and both are facing the test book. The examiner should sit so that he can comfortably point to the illustrations with one hand while recording responses with the other. The score sheet should be kept in an inconspicuous position. Before beginning the test, the examiner should be sure that the child is comfortable and that any distracting objects have been removed from the area.

The introduction should be read to the child without any additional comments by the examiner. Any relevant questions may be answered, but the child should be encouraged to stay with the test. Throughout the test, comments on how well the child is doing may be made as long as they are given randomly and are not contingent upon the response of the child. If the child should become especially tired or restless during the test, a short break for a drink of water

or a little movement is permitted.

The examiner should read the text and point to each gumpgookie as it is described, beginning with the gumpgookie indicated in parentheses beside the first phrase for each item. On page iv and v of the introduction, the examiner should point to the picture of the boy or girl, according to the sex of the child, and then to the corresponding gumpgookie.

Four practice items follow the introduction, appearing in blocks vi, vii, viii and ix. For these items, the examiner should read the text and wait for the child to respond. It may be necessary to repeat the text and remind the child that he is to point to his gumpgookie, i.e., the gumpgookie that likes what he likes and does what he does. After the child responds, the examiner should ask him which object he, the child, likes best. The child may respond by speaking or pointing. If the child's choice of a gumpgookie is consistent with his choice as to which object he liked, the examiner should reassure him that he is proceeding correctly. If his response is inconsistent, however, the examiner should explain that if the child likes one of the objects, then his gumpgookie is the one which also likes that object. The child should then be given another opportunity to select his

gumpgookie. Exactly the same procedure should be used for the next three practice items. It is essential that the child understand exactly what to do before he begins the actual test. If the examiner has any doubt as to whether or not the child knows what to do, the four practice items should be repeated in the same manner until the examiner is confident that the child understands the procedure. If the child does not appear to understand the procedure after going over the practice items several times, the examiner should not administer the test.

Beginning with the first item, there should be a minimum of interaction between the examiner and the child. The examiner should read each item carefully, pointing to the appropriate gumpgookie as it is described, and then remove his hand in order to allow the child to point to his gumpgookie. Each item number corresponds to a number on the answer sheet. As the child points to his gumpgookie, the examiner should mark the appropriate column on the answer sheet. The items should be read with expression but not in any way that would bias the child's decisions. The child should respond as soon as he has listened to the entire question. After all of the items have been completed, the examiner should thank the child for helping the examiner find

the child's gumpgookie in each of the pictures.

Scoring. In each of the dichotomous items, one of the gumpgookies exhibits a greater degree of motivation to achieve than the others. Hence, the response indicating the greater degree of motivation is scored one and the alternative response, zero.

The answer sheet for Gumpgookies should be completed with the following information: the child's name, his sex, and his age in years and months. If the time between a child's birth date and the test date is, for example, 5 years, two months, and 16 or more days, round the number of months upward--i.e., record the age as 63 months. If the calculated age is 5 years, two months, and 15 or fewer days, round the number of months downward--i.e., record the age as 62 months. The child's birth date and the date the test is administered should be recorded, as well as the name of the teacher, the name of the examiner, identification of the class, and the time required to give the test. For some purposes a notation regarding ethnic group background may be added, along with an identification number of the child.

The blocks labeled Practice Items are to be used to record the child's responses to the practice items. If the child's choice of his gumpgookie is consistent with his

choice of what he likes best, the column labeled C should be checked; if the child's choice of his gumpgookie is inconsistent with his choice of what he likes best, the column labeled I should be checked. Answers to the test items are keyed in one of two ways--either left and right or up and down. Some items are in the left and right positions, some are in up and down positions, and some are diagonal. Items with figures placed in side by side positions on the page are always keyed left or right, and items with figures placed in up and down or diagonal positions are always keyed up or down. The score sheet contains two blank columns to the right of the item numbers. If the child responds by pointing to the gumpgookie in the left or up position, a check is put in the L/U column by the corresponding item number. Right or down responses are recorded with a check in the R/D column. After the answer sheets have been scored by use of a key, the total number of motivated responses should be written in the space provided.

Scoring Key for 75-Item Gumpgookies Test
April, 1969

Item No.	Correct Response	Item No.	Correct Response	Item No.	Correct Response
1	L	26	D	51	U
2	D	27	U	52	L
3	R	28	D	53	D
4	U	29	U	54	L
5	U	30	R	55	R
6	L	31	R	56	U
7	L	32	D	57	R
8	U	33	U	58	R
9	D	34	U	59	L
10	D	35	R	60	D
11	R	36	D	61	U
12	U	37	D	62	D
13	L	38	R	63	D
14	D	39	L	64	D
15	U	40	U	65	U
16	R	41	D	66	U
17	U	42	L	67	L
18	L	43	U	68	U
19	D	44	L	69	U
20	L	45	L	70	R
21	R	46	D	71	D
22	D	47	D	72	R
23	U	48	U	73	R
24	L	49	D	74	D
25	D	50	R	75	U

CHILDREN'S ANSWER SHEET (75 Items)

Bonnie L. Baliff and Dorothy G. Adkins

ID# _____ Name _____ Sex _____

Date ____/____/____

Birthday ____/____/____

Chronological Age ____/____/____

____ months

Teacher _____ Type of Class ____

Examiner _____ ID# _____

75 items

____ (# wrong)

____ TOTAL # RIGHT

PRACTICE ITEMS:

C		I
	-1-	
	-2-	
	-3-	
	-4-	

Item No.	I/E	R/D	Item No.	I/E	R/D	Item No.	I/E	R/D
1			26			51		
2			27			52		
3			28			53		
4			29			54		
5			30			55		
6			31			56		
7			32			57		
8			33			58		
9			34			59		
10			35			60		
11			36			61		
12			37			62		
13			38			63		
14			39			64		
15			40			65		
16			41			66		
17			42			67		
18			43			68		
19			44			69		
20			45			70		
21			46			71		
22			47			72		
23			48			73		
24			49			74		
25			50			75		

Time Ended _____

Time Begun _____

Difference _____

Experimental Edition
Form III

GUMPGOOKIES

Do Not Write in This Box

Name:_____	Date:_____
Sex: M_____ F_____	Examiner:_____
Age Years:_____Months:____	Teacher:_____
Birth Date:_____	Class ID#:_____
Ethnic Origin:_____	City & State:_____
Socio-Economic Status:____	Sample:_____
Religion:_____	

Appendix F: Raw Data

STUDNUM STUDNUM

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	1.4	1.5	1.5
	2	1	1.4	1.5	3.0
	3	1	1.4	1.5	4.5
	4	1	1.4	1.5	6.0
	5	1	1.4	1.5	7.5
	7	1	1.4	1.5	9.0
	8	1	1.4	1.5	10.4
	9	1	1.4	1.5	11.9
	10	1	1.4	1.5	13.4
	11	1	1.4	1.5	14.9
	13	1	1.4	1.5	16.4
	14	1	1.4	1.5	17.9
	15	1	1.4	1.5	19.4
	16	1	1.4	1.5	20.9
	18	1	1.4	1.5	22.4
	19	1	1.4	1.5	23.9
	20	1	1.4	1.5	25.4
	21	1	1.4	1.5	26.9
	22	1	1.4	1.5	28.4
	23	1	1.4	1.5	29.9
	24	1	1.4	1.5	31.3
	25	1	1.4	1.5	32.8
	26	1	1.4	1.5	34.3
	27	1	1.4	1.5	35.8
	28	1	1.4	1.5	37.3
	29	1	1.4	1.5	38.8
	30	1	1.4	1.5	40.3
	31	1	1.4	1.5	41.8
	32	1	1.4	1.5	43.3
	33	1	1.4	1.5	44.8
	34	1	1.4	1.5	46.3
	35	1	1.4	1.5	47.8
	36	1	1.4	1.5	49.3
	37	1	1.4	1.5	50.7
	39	1	1.4	1.5	52.2
	42	1	1.4	1.5	53.7
	44	1	1.4	1.5	55.2
	45	1	1.4	1.5	56.7
	46	1	1.4	1.5	58.2
	47	1	1.4	1.5	59.7
	48	1	1.4	1.5	61.2
	49	1	1.4	1.5	62.7
	50	1	1.4	1.5	64.2
	51	1	1.4	1.5	65.7
	52	1	1.4	1.5	67.2
	53	1	1.4	1.5	68.7
	54	1	1.4	1.5	70.1
	55	1	1.4	1.5	71.6
	56	1	1.4	1.5	73.1
	57	1	1.4	1.5	74.6
	58	1	1.4	1.5	76.1
	59	1	1.4	1.5	77.6
	60	1	1.4	1.5	79.1
	61	1	1.4	1.5	80.6
	62	1	1.4	1.5	82.1

63	1	1.4	1.5	83.6
64	1	1.4	1.5	85.1
65	1	1.4	1.5	86.6
66	1	1.4	1.5	88.1
67	1	1.4	1.5	89.6
68	1	1.4	1.5	91.0
69	1	1.4	1.5	92.5
70	1	1.4	1.5	94.0
71	1	1.4	1.5	95.5
72	1	1.4	1.5	97.0
73	1	1.4	1.5	98.5
74	1	1.4	1.5	100.0
.	3	4.3	Missing	
Total	70	100.0	100.0	

Mean	38.478	Std err	2.673	Median	37.000
Mode	1.000	Std dev	21.877	Variance	478.587
Kurtosis	-1.251	S E Kurt	.578	Skewness	-.054
S E Skew	.293	Range	73.000	Minimum	1.000
Maximum	74.000	Sum	2578.000		

Valid cases 67 Missing cases 3

SEX SEX

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
MALE	0	30	42.9	44.8	44.8
FEMALE	1	37	52.9	55.2	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	.552	Std err	.061	Median	1.000
Mode	1.000	Std dev	.501	Variance	.251
Kurtosis	-2.015	S E Kurt	.578	Skewness	-.215
S E Skew	.293	Range	1.000	Minimum	.000
Maximum	1.000	Sum	37.000		

Valid cases 67 Missing cases 3

AGE AGE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	112	2	2.9	3.0	3.0
	113	4	5.7	6.0	9.0
	114	3	4.3	4.5	13.4
	115	1	1.4	1.5	14.9
	116	5	7.1	7.5	22.4
	117	1	1.4	1.5	23.9
	118	4	5.7	6.0	29.9
	119	7	10.0	10.4	40.3
	120	9	12.9	13.4	53.7
	121	4	5.7	6.0	59.7
	122	6	8.6	9.0	68.7
	123	5	7.1	7.5	76.1
	124	4	5.7	6.0	82.1
	125	4	5.7	6.0	88.1
	126	4	5.7	6.0	94.0
	128	1	1.4	1.5	95.5
	129	1	1.4	1.5	97.0
	130	1	1.4	1.5	98.5
	132	1	1.4	1.5	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	120.373	Std err	.548	Median	120.000
Mode	120.000	Std dev	4.488	Variance	20.147
Kurtosis	-.192	S E Kurt	.578	Skewness	.126
S E Skew	.293	Range	20.000	Minimum	112.000
Maximum	132.000	Sum	8065.000		

Valid cases 67 Missing cases 3

RELIGION RELIGION

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
LDS	1	51	72.9	76.1	76.1
UNITED	2	4	5.7	6.0	82.1
CATHOLIC	3	3	4.3	4.5	86.6
BUDDHIST	4	1	1.4	1.5	88.1
NOTGIVEN	6	8	11.4	11.9	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	1.791	Std err	.203	Median	1.000
Mode	1.000	Std dev	1.665	Variance	2.774
Kurtosis	2.381	S E Kurt	.578	Skewness	1.986
S E Skew	.293	Range	5.000	Minimum	1.000
Maximum	6.000	Sum	120.000		

Valid cases 67 Missing cases 3

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CLASS_ID CLASS_ID

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
TREATMENT GROUP	1	20	28.6	29.9	29.9
PRE/POST CONTROL	2	20	28.6	29.9	59.7
POSTTEST ONLY CONTRO	3	27	38.6	40.3	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	2.104	Std err	.102	Median	2.000
Mode	3.000	Std dev	.837	Variance	.701
Kurtosis	-1.550	S E Kurt	.578	Skewness	-.202
S E Skew	.293	Range	2.000	Minimum	1.000
Maximum	3.000	Sum	141.000		

Valid cases 67 Missing cases 3

KIDSINFA KIDSINFA

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	2	5	7.1	7.5	7.5
	3	14	20.0	20.9	28.4
	4	13	18.6	19.4	47.8
	5	14	20.0	20.9	68.7
	6	10	14.3	14.9	83.6
	7	5	7.1	7.5	91.0
	8	2	2.9	3.0	94.0
	10	1	1.4	1.5	95.5
	11	2	2.9	3.0	98.5
	15	1	1.4	1.5	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	4.955	Std err	.285	Median	5.000
Mode	3.000	Std dev	2.332	Variance	5.437
Kurtosis	4.922	S E Kurt	.578	Skewness	1.785
S E Skew	.293	Range	13.000	Minimum	2.000
Maximum	15.000	Sum	332.000		

Valid cases 67 Missing cases 3

BIRTHORD BIRTHORD

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	13	18.6	19.4	19.4
	2	17	24.3	25.4	44.8
	3	17	24.3	25.4	70.1
	4	6	8.6	9.0	79.1
	5	6	8.6	9.0	88.1
	6	7	10.0	10.4	98.5
	13	1	1.4	1.5	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	3.090	Std err	.243	Median	3.000
Mode	2.000	Std dev	1.990	Variance	3.962
Kurtosis	7.966	S E Kurt	.578	Skewness	2.083
S E Skew	.293	Range	12.000	Minimum	1.000
Maximum	13.000	Sum	207.000		

Valid cases 67 Missing cases 3

KIDSHOME KIDSHOME

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	2	2.9	3.0	3.0
	2	6	8.6	9.0	11.9
	3	15	21.4	22.4	34.3
	4	15	21.4	22.4	56.7
	5	15	21.4	22.4	79.1
	6	6	8.6	9.0	88.1
	7	5	7.1	7.5	95.5
	8	1	1.4	1.5	97.0
	9	1	1.4	1.5	98.5
	11	1	1.4	1.5	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	4.373	Std err	.224	Median	4.000
Mode	3.000	Std dev	1.833	Variance	3.359
Kurtosis	1.779	S E Kurt	.578	Skewness	.917
S E Skew	.293	Range	10.000	Minimum	1.000
Maximum	11.000	Sum	293.000		

Valid cases 67 Missing cases 3

TIMEHERE TIMEHERE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
0 FULL YEARS IN LOCA	0	5	7.1	7.5	7.5
1 FULL YEAR IN LOCA	1	4	5.7	6.0	13.4
2 FULL YEARS IN LOCA	2	6	8.6	9.0	22.4
3 FULL YEARS IN LOCA	3	3	4.3	4.5	26.9
4 FULL YEARS IN LOCA	4	49	70.0	73.1	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	3.299	Std err	.158	Median	4.000
Mode	4.000	Std dev	1.291	Variance	1.667
Kurtosis	1.232	S E Kurt	.578	Skewness	-1.628
S E Skew	.293	Range	4.000	Minimum	.000
Maximum	4.000	Sum	221.000		

Valid cases 67 Missing cases 3

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DISTANCE DISTANCE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
WALK 0-2 BLOCKS	1	13	18.6	19.4	19.4
WALK OVER 2 BLOCKS	2	3	4.3	4.5	23.9
BIKE	3	23	32.9	34.3	58.2
PARENT RIDE	4	11	15.7	16.4	74.6
BUS	5	17	24.3	25.4	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	3.239	Std err	.172	Median	3.000
Mode	3.000	Std dev	1.404	Variance	1.972
Kurtosis	-1.004	S E Kurt	.578	Skewness	-.305
S E Skew	.293	Range	4.000	Minimum	1.000
Maximum	5.000	Sum	217.000		

Valid cases 67 Missing cases 3

GROUPREF GRP_PREF

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
BOSS	1	6	8.6	9.0	9.0
FRIEND	2	49	70.0	73.1	82.1
WINNER	3	12	17.1	17.9	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	2.090	Std err	.063	Median	2.000
Mode	2.000	Std dev	.514	Variance	.265
Kurtosis	.818	S E Kurt	.578	Skewness	.145
S E Skew	.293	Range	2.000	Minimum	1.000
Maximum	3.000	Sum	140.000		

Valid cases 67 Missing cases 3

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AIMCOUNT AIMCOUNT

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	61	87.1	91.0	91.0
	1	6	8.6	9.0	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	.090	Std err	.035	Median	.000
Mode	.000	Std dev	.288	Variance	.083
Kurtosis	6.854	S E Kurt	.578	Skewness	2.941
S E Skew	.293	Range	1.000	Minimum	.000
Maximum	1.000	Sum	6.000		

Valid cases 67 Missing cases 3

COMP_USE COMP_USE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
< ONCE MONTHLY	1	6	8.6	9.0	9.0
ONCE MONTHLY	2	2	2.9	3.0	11.9
> ONCE MONTHLY	3	6	8.6	9.0	20.9
ONCE WEEKLY	5	14	20.0	20.9	41.8
> ONCE WEEKLY	6	21	30.0	31.3	73.1
< ONCE DAILY	7	4	5.7	6.0	79.1
ONCE DAILY	8	5	7.1	7.5	86.6
> ONCE DAILY	9	9	12.9	13.4	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	5.567	Std err	.278	Median	6.000
Mode	6.000	Std dev	2.278	Variance	5.189
Kurtosis	-.282	S E Kurt	.578	Skewness	-.419
S E Skew	.293	Range	8.000	Minimum	1.000
Maximum	9.000	Sum	373.000		

Valid cases 67 Missing cases 3

COMPCOOK PRE_TEST

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	27	38.6	40.3	40.3
	34	2	2.9	3.0	43.3
	35	1	1.4	1.5	44.8
	38	1	1.4	1.5	46.3
	41	1	1.4	1.5	47.8
	42	1	1.4	1.5	49.3
	44	1	1.4	1.5	50.7
	54	1	1.4	1.5	52.2
	57	1	1.4	1.5	53.7
	58	1	1.4	1.5	55.2
	59	1	1.4	1.5	56.7
	60	1	1.4	1.5	58.2
	61	1	1.4	1.5	59.7
	62	1	1.4	1.5	61.2
	63	7	10.0	10.4	71.6
	64	2	2.9	3.0	74.6
	65	2	2.9	3.0	77.6
	66	6	8.6	9.0	86.6
	67	1	1.4	1.5	88.1
	68	1	1.4	1.5	89.6
	69	1	1.4	1.5	91.0
	70	2	2.9	3.0	94.0
	71	2	2.9	3.0	97.0
	72	1	1.4	1.5	98.5
	73	1	1.4	1.5	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	35.896	Std err	3.776	Median	44.000
Mode	.000	Std dev	30.905	Variance	955.125
Kurtosis	-1.854	S E Kurt	.578	Skewness	-.212
S E Skew	.293	Range	73.000	Minimum	.000
Maximum	73.000	Sum	2405.000		

Valid cases 67 Missing cases 3

TESTTYPE TESTTYPE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
PRETEST	1	40	57.1	59.7	59.7
POSTTEST	2	27	38.6	40.3	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	1.403	Std err	.060	Median	1.000
Mode	1.000	Std dev	.494	Variance	.244
Kurtosis	-1.894	S E Kurt	.578	Skewness	.405
S E Skew	.293	Range	1.000	Minimum	1.000
Maximum	2.000	Sum	94.000		

Valid cases 67 Missing cases 3

RANKCINCL RANKCINCL

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	47	67.1	70.1	70.1
	1	1	1.4	1.5	71.6
	2	1	1.4	1.5	73.1
	3	1	1.4	1.5	74.6
	4	1	1.4	1.5	76.1
	5	1	1.4	1.5	77.6
	6	1	1.4	1.5	79.1
	7	1	1.4	1.5	80.6
	8	1	1.4	1.5	82.1
	9	1	1.4	1.5	83.6
	10	1	1.4	1.5	85.1
	11	1	1.4	1.5	86.6
	12	1	1.4	1.5	88.1
	13	1	1.4	1.5	89.6
	14	1	1.4	1.5	91.0
	15	1	1.4	1.5	92.5
	17	2	2.9	3.0	95.5
	18	1	1.4	1.5	97.0
	19	2	2.9	3.0	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	3.134	Std err	.706	Median	.000
Mode	.000	Std dev	5.781	Variance	33.421
Kurtosis	1.487	S E Kurt	.578	Skewness	1.695
S E Skew	.293	Range	19.000	Minimum	.000
Maximum	19.000	Sum	210.000		

Valid cases 67 Missing cases 3

GUMPGOO2 POSTTEST

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	28	1	1.4	1.5	1.5
	35	1	1.4	1.5	3.0
	37	1	1.4	1.5	4.5
	38	1	1.4	1.5	6.0
	39	1	1.4	1.5	7.5
	42	1	1.4	1.5	9.0
	45	1	1.4	1.5	10.4
	48	1	1.4	1.5	11.9
	50	2	2.9	3.0	14.9
	51	1	1.4	1.5	16.4
	52	2	2.9	3.0	19.4
	53	2	2.9	3.0	22.4
	55	1	1.4	1.5	23.9
	56	1	1.4	1.5	25.4
	57	3	4.3	4.5	29.9
	58	2	2.9	3.0	32.8
	59	5	7.1	7.5	40.3
	60	6	8.6	9.0	49.3
	61	5	7.1	7.5	56.7
	62	4	5.7	6.0	62.7
	63	1	1.4	1.5	64.2
	64	1	1.4	1.5	65.7
	65	2	2.9	3.0	68.7
	66	5	7.1	7.5	76.1
	67	3	4.3	4.5	80.6
	68	4	5.7	6.0	86.6
	69	4	5.7	6.0	92.5
	70	2	2.9	3.0	95.5
	71	1	1.4	1.5	97.0
	72	1	1.4	1.5	98.5
	73	1	1.4	1.5	100.0
	.	3	4.3	Missing	
	Total	70	100.0	100.0	

Mean	59.269	Std err	1.163	Median	61.000
Mode	60.000	Std dev	9.523	Variance	90.684
Kurtosis	1.475	S E Kurt	.578	Skewness	-1.235
S E Skew	.293	Range	45.000	Minimum	28.000
Maximum	73.000	Sum	3971.000		

Valid cases 67 Missing cases 3