Changes in Experimental Subject Selection and Reporting
in Psychological Research (1917-1997)

by

Grace Sau-Yan Chan
B.A., University of Victoria, 1974

A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF ARTS

in the Department of Educational Psychology and Leadership Studies

We accept this thesis as conforming
to the required standard

[redacted]

Dr. W.A.R. Boyer, Supervisor (Department of Educational Psychology and Leadership Studies)

[redacted]

Dr. J.O. Anderson, Departmental Member (Department of Educational Psychology and Leadership Studies)

[redacted]

Dr. C.E. Harris, Outside Member (Department of Educational Psychology and Leadership Studies)

[redacted]

Dr. T.G. Fleming, External Examiner (Department of Curriculum and Instruction)

University of Victoria

Supervisor: Dr. W.A.R. Boyer

ABSTRACT

The purpose of this study is to identify the trends and changes, detect bias and inadequacy in subject selection and reporting over the last 80 to 90 years in the history of psychology. Using the archival research method and the content analysis technique, this study examines demographic information of participants, sample selection procedures, and reporting practices in 384 sampled research articles published in three mainstream psychological journals. Using 13 predetermined categories based on the APA suggested content of subject subsection, subject information was systematically coded in 20-year intervals (1917, 1937, 1957, 1977, and 1997). Findings indicated an overall inadequacy in reporting of subject information, with gradual improvement over the years. Other findings revealed the lack of random sampling in research, and a bias toward the use of college and university students, as well as white, middle class children.

Examiners:

[redacted]

Dr. W.A.R. Boyer, Supervisor (Department of Educational Psychology and Leadership Studies)

[redacted]

Dr. J.O. Anderson, Department Member (Department of Educational Psychology and Leadership Studies)

[redacted]

Dr. C.E. Harris, Outside member (Department of Educational Psychology and Leadership Studies)

[redacted]

Dr. T.G. Fleming, External Examiner (Department of Curriculum and Instruction)

Table of Contents

Page

Abstract ii

Table of Contents iii

List of Tables v

List of Figures vi

Chapter 1 - Introduction 1

Introduction 1

Historical background of the role of research participants 1

Statement of the problem 4

Purpose of the study 4

Definition of terms 6

Assumptions 8

Chapter 2 - Review of Literature 10

Research using the content analysis methods 10

College students as research participants 10

Minorities, children, and females as research participants 13

Research on reporting and description of research participants 15

APA guidelines on subject description 15

Reporting of children samples 17

Reporting standards in varied populations 19

Research on subject characteristics 22

Characteristics of college students 22

Characteristics of volunteer subjects 23

Other literature on research participants 26

Literature on sampling issues 28

Chapter 3 - Methodology 31
Archival research 31
Content analysis 32
Research design 35
Method 35
Samples 35
Coding categories 38
Intercoder reliability 39
Analysis 40

Chapter 4 - Results 42
Reported subject information 42
Analysis of categories 43
Intercoder reliability 68

Chapter 5 - Discussion 70
Subject reporting and selection 70
Conclusions 77
Implications 79
Recommendations 81

References 85

List of Tables

		Page
Table 1	Reported Subject Information	43
Table 2	Number of Subjects Used	44
Table 3	Samples with over 100 Subjects	45
Table 4	Sex of Subjects Reported	46
Table 5	Percentage of Male Subjects Used in Research	47
Table 6	Research Using 40-60% Male Subjects	48
Table 7	Age of Subjects Reported	50
Table 8	Age Groups of Subjects	51
Table 9	Types of Subjects	52
Table 10	Types of Subjects in C.D.	53
Table 11	Geographic Location Reported	54
Table 12	Named Institution Reported	55
Table 13	Subjects' Institutional Affiliation Reported	56
Table 14	Types of Institution Reported in J.E.P. and J.Ed.P.	56
Table 15	Types of Institution Reported in C.D.	57
Table 16	Selection Procedures Reported	58
Table 17	Reward Reported	60
Table 18	Reward Used in J.E.P.in 1977 and 1997	61
Table 19	Exclusions and Reasons Reported	62
Table 20	Race / Ethnicity Reported	63
Table 21	SES Reported	65
Table 22	Other Information Reported	66

List of Figures

		Page
Figure 1	Percentage of reported subject information	43
Figure 2	Number of subjects used	45
Figure 3	Samples with over 100 subjects	46
Figure 4	Sex of subjects reported	47
Figure 5	Percentage of male subjects used	48
Figure 6	Research using between 40-60% male subjects	49
Figure 7	Age of subjects reported	50
Figure 8	Age groups of subjects	51
Figure 9	Types of subjects	52
Figure 10	Geographical location reported	54
Figure 11	Named institution reported	55
Figure 12	Subjects' institutional affiliation reported	56
Figure 13	Types of institution reported	57
Figure 14	Selection procedure reported	59
Figure 15	Reward reported	60
Figure 16	Reward used in J.E.P. in 1977 and 1997	61
Figure 17	Exclusions and reasons reported	62
Figure 18	Race/ethnicity reported	64
Figure 19	SES reported	65
Figure 20	Other information reported	67

CHAPTER 1 - INTRODUCTION

One important aim of research in educational, developmental, and other fields of psychology is that researchers make general statements about their findings (Plutchik, 1983). Generalizations, from the researchers' perspective, about various populations can only be made when they have adequate sampling of the larger populations. Over the years, research methods textbooks have outlined the importance of defining the population of interest, and of finding techniques to randomly sample the population (Goodwin, 1995; Gall, Borg, & Gall, 1996). It is evident, however, that most psychologists rarely practice these strategies taught in the textbooks. Actual random sampling from the target population is rare. A cursory overview of psychological literature reveals that psychologists in their studies primarily involve college students, especially those enrolled in introductory psychology courses as participants (Smart, 1966).

Criticism is sometimes made that our psychological knowledge is based on the studies of college sophomores or white rats (Smart, 1966; Goodwin,1995). Much psychological research is done using subjects who are convenient and accessible rather than random samples of defined populations. Such criticism has implications for external validity which is the degree to which research findings can be generalized. It is suggested that only research designs with a high degree of external validity permit wide generalization (Baltes, Reese, & Nesselroade, 1977). If subjects selection bias is commonly found in psychological research, it is questionable whether the samples are representative or the generalizations legitimate. It would be useful to examine how these concerns regarding research participants arise.

Historical Background of the Role of Research Participants

Psychology as a field of research developed out of already existing fields like philosophy and physiology. When Wundt established the first psychology laboratory in Leipsig in 1879, often regarded as the birth date of modern psychology, he based his work on traditional investigative practices of physiology. Wundt proposed to apply

procedures of physiological experimentation to the study of such matters as consciousness and inner experience, in the belief that the inner world of private experiences could be methodically explored.

The participants in Wundt's laboratory were asked to assume the role of observers. They were either researchers themselves or graduate students, highly skilled and motivated, engaging in the introspective technique of self-experimentation. Introspective reactions to psychological stimuli were complex and time-consuming, performed by well-trained participants. Each individual's conscious responses was given immediately, allowing no time for reflection.

Boring (1953) noted that observers were only considered worthy to provide data for publication after having performed thousands of introspective reactions. These observers were sometimes referred to as "reagents", defined in natural science as any substance that takes part in or brings about a particular reaction (Schultz, 1969). Schultz (1969) found that the subjects were like "recording instruments, objectively noting the characteristics of their focus of observation" (p.215). Subjects were objective, detached machines accurately reporting the observed processes. They were, however, the objects of investigation and data source while the experimenters acted as experimental manipulators of the apparatus.

In Wundt's laboratory, the division of labor in the experimental situation was found in the unique interaction between the experimenter's role and the subject's role, with members of the research community participating as subjects. For example, Wundt appeared regularly as a subject or data source in his students' research. Even though he contributed much of the theory underlying these experiments, he did not take on the role of the experimenter. This suggested that the data source was considered to require more psychological sophistication than did the experimenter (Danziger, 1990). Common mental processes measured under restricted conditions were the object of study.

At the same time, researchers such as Charcot and others were using experimental hypnosis as another model of experimentation in France (Danziger, 1985). In clinical experiments, a clear distinction was made between the role of the male experimenters and the role of the generally female subjects. It usually began in a medical context with

physician-patient relationships continuing into experimental situations where patients were being compared to normal, healthy subjects. The term "subject" designated the participants as the objects of medical care and, eventually, the term was generalized to refer to any individual under psychological investigation.

In addition to these two models, other models of experimentation were emerging. In 1884, Galton set up an anthropometric laboratory for testing the mental faculties of ordinary people from the general population of naive subjects who had never been tested or studied before. The roles of the investigator and the participants were unchangeable, with the investigator having expert knowledge about the individual tested, and the participants paying for the service. Results of the measurement were given to individuals tested, and information was provided about their abilities to perform specific tasks (Danziger, 1990).

Galton (1907) also introduced the study of twins as a method to assess the relative contribution of "nature and nurture". The nature-nurture problem interested many child psychologists including Gesell, who founded a psychology clinic in 1911, and conducted research that established maturational standards for children (Thorne & Henley, 1997).

Among his many contributions and influences, Galton, through studies on physiological measures and intelligence, facilitated the development of methodological and statistical techniques including correlation and regression toward the mean. As the self-observation method was gradually replaced by assumed practices of greater objectivity, the analysis of patterns within expert observers' individual responses was achieved by studying aggregates and groups of subjects using descriptive statistics. This brought about a change in the kind of human subjects studied from the expert participants to the untrained and naive participants. As Danziger (1990) noted, "psychological characteristics of the collective rather than individual subjects" (p.74) were the focus, and average values from group data were regarded as appropriate tools for scientific psychological investigation.

In 1913, Watson published a famous paper "Psychology as the Behaviorist Views It" which proposed a radical departure from the study of inner consciousness, and advocated overt and observable behavior as the subject matter of psychology.

Behaviorism brought about a total change in the role human subjects play in research. Human subjects had to behave like machines (Schultz, 1969). The research participants were like mechanical objects reacting to the manipulation and control of the experimenter, in sequences of associative stimulus-response bonds.

By 1930, Behaviorism was well established as the dominant viewpoint in experimental psychology, and the period between 1913 and 1950 was referred to as the Behaviorist era (Leahy, 1997). Eventually, the pendulum swung back to the cognitive perspective of mental processes which had been neglected for decades.

As changes occur in the science of psychology over the years, the role of human subjects has also gone through changes. This proposed study will employ archival research in order to study existing records of participant demographics using a non-experimental research methodology. It will be descriptive in nature in order to understand better the changes in the history of subject use in psychological research.

Statement of the Problem

Who were the participants in psychological research and what changes occurred in subject selection and reporting practices over the last 80-90 years in the history of psychology? Using a content analysis technique, this study examined demographic information of research participants in major psychological journal articles. Taking a historical perspective, the analysis sampled research published at different periods of time, at 20-year intervals, through the short history of psychology between 1910s and 1990s in the fields of basic (*Journal of Experimental Psychology*), educational (*Journal of Educational Psychology*), and developmental psychology (*Child Development*).

Purpose of Study

The purpose of this study is to chart demographic information regarding participants in psychological research, and how selection and reporting of this information has changed through the history of psychology. As seen from the brief history of psychology, there were varying views regarding the role of research participants.

Criticisms have been made regarding the bias in subject selection and the vast number of studies which were based on data supplied by subjects who were not representative of the general population.

This study historically examined published articles in mainstream psychological journals in various fields of study including basic, educational, and developmental research in psychology betwen 1917 and 1997. Using the archival research method, journal articles were analyzed to gather information concerning the participants in historical research. Therefore, the specific purpose of this study was to find out if criticisms of bias in the data sources of psychological research can be substantiated. If such bias does exist, it is also important to study the implications and examine the consequences. Future researchers should be aware and should make every attempt to avoid such bias in their research. Using a non-experimental and descriptive methodology, existing records published between the 1910s to the 1990s were examined systematically in 20-year intervals to identify the trends and changes in subject selection and reporting.

Although not testing hypotheses, this study focuses on a number of areas regarding subjects in research. First, it is expected that bias will be found in the gender, educational level, age, and race of subjects. Second, it is anticipated that changes in subject selection have occurred over the years and, third, that subject selection and reporting are not adequately addressed in research articles. Overall, the significance of this study involves the identification of whether or not a bias in data sources from 1910s to the 1990s has occurred and the implications of this narrow data base on psychological knowledge. Another purpose is to find out the extent of inadequate reporting of important subject information in research reports.

Previous studies have identified various forms of bias in short time periods in specific areas of research as well as inadequacy in the reporting of subject information. This study however, sampled a longer time span from different areas of research, hoping to observe changes, to understand the issue from a broader perspective, and to attempt to address some the relating issues and problems.

Definition of Terms

Archival Research

Through archival research, one examines available records of past events. These records will include books, documents, manuscripts, records of public information, and many other forms of archival data that were set up for other purposes. Archival research uses these existing records which were collected before the time of the study and not for the purpose of the study (Ray, 1997). This study examined articles in three mainstream psychological journals published between 1917 and 1997.

Content Analysis

Content analysis is a research technique involving a systematic counting of the frequency of occurrence of ideas, themes, concepts, and terms in any form of verbally communicated material (Goodwin, 1995; Sutherland, 1990). It is a systematic, quantitative and qualitative procedure studying particular aspects and descriptions of the content of materials under investigation.

Generalizability

Generalizability is the accuracy with which findings in research can be transferred to situations and groups other than those originally studied (Goldenson, ed., 1984). It is an inference or the process of making an inference or drawing general conclusions that what is true for known members of a sample is also true of other unknown members in the population (Sutherland, 1990).

External Validity

External validity refers to the degree to which the results of research findings can be generalized. Campbell and Stanley (1966) originated the usage of this concept and listed a number of dimensions involved in designing externally valid studies. External validity concerns generalizing from an observation of a small data set to other potential data sets from a larger domain. External validity is a question to be considered at the design stage of research, and only designs with a high degree of external validity permit wide generalization (Baltes, et al., 1977).

Subject

Any person, animal, or organism on whom an experiment is conducted is referred to as a subject. It is a name given to research participants indicating their taking part in an activity when their experiences are being reported and evaluated. In the early years of experimentation, subjects were referred to as "observers", and in recent years, they are referred to as "participants" in research reports.

Population

A population is all possible cases of what the researchers are interested in studying. It is all the members of an identifiable group (Goodwin, 1995) which might be small or large in size. Usually, the population of interest is too large for every member in it to be tested. A subgroup of that population called the sample will be selected for testing.

Sample

A sample is part of a population, usually randomly selected to be representative of the whole population on which data are gathered (Sutherland, 1990). It is a function of a population of subjects drawn in order to generalize about or to describe the population as a whole (Goldenson, ed., 1984). The sample is selected, consisting of cases actually studied. If the sample is truly representative, the experimental findings should apply to the population as a whole.

Random Sample

A random sample is a sample drawn from a population in a way that each member of the population has an equal chance of being selected as a member of the sample, and that only chance dictates which unit is selected in a random sample (Goldenson, ed., 1984). By using proper sampling procedures, a small number of units of a population is presumed to be representative of the population, which enable the nature of that population to be inferred from the sample.

Representativeness

A sample is said to be representative when it reflects the population as a whole. A representative sample accurately symbolizes and reproduces essential

A sample is said to be representative when it reflects the population as a whole. A representative sample accurately symbolizes and reproduces essential characteristics of its population. It was said that representativeness is the foundation of scientific sampling (Goldenson, ed., 1984).

Sampling Bias

Sampling bias occurs when any factors or method of sampling makes the sample nonrepresentative of the population from which it was drawn. A bias is an error in a particular direction. A biased sample has the tendency to produce distorted results and misleading conclusions because data collected are incomplete when the sample is not representative of the population of interest.

Convenience Sample

Used frequently in psychological research, the sampling is opportunistic when no special sampling procedure is used , and the only criterion in choosing a sample is convenience. Volunteers from a group of available people who meet the general requirement of the study are used as subjects in research (Goodwin, 1995).

Assumptions

The following assumptions were expected to prevail throughout the study: Psychological research should reflect changes that occur in the existing society. Furthermore, in the present pluralistic society, it is the opinion of the author that researchers need to eliminate bias and be aware of issues of gender, race, ethnicity, and special social and interest groups. It is expected that journal reports would reflect these changes, and that journal editors would be gatekeepers, ensuring clarity regarding desirable representation of these research subjects.

Summary of Chapter 1

The role of research participants had gone through some changes through the history of psychology. The historical background of these changes are reviewed in this chapter. Important terms and concepts related to this study are also defined. It has been said that psychologists know a great deal about college students and white rats. This study

analyzes research in journal articles from different eras to examine the trends and practices of researchers in the area of subject selection and reporting.

Organization of Thesis

Chapter 1 is an introduction outlining the purpose of the study. Historical background of research participants and their significance at different periods of time are discussed. The research question is stated and important terms and concepts are defined and discussed.

Chapter 2 is a review of relevant literature. Prior research on journal articles using the content analysis research technique will be reviewed. Also, research methodology such as selection of subjects, problems and biases, sampling issues, concerns about external validity and generalizability, and other issues are discussed.

Chapter 3 describes content analysis as a research technique, details about the journals selected, and the different time periods examined. Also included are descriptions of the data collection procedures and the categories. Methods of data analysis and statistical presentations are included.

CHAPTER 2 - REVIEW OF LITERATURE

Introduction

This chapter reviews literature in areas relating to subject selection biases and inadequate reporting practices in psychological research. It includes research in the content analysis form, literature on subject description and reporting, studies on the characteristics of subjects and related topics, and literature on research methodology.

Research Using the Content Analysis Methods

In the area of content analysis, a number of journal articles deal specifically with topics of college students, ethnic minorities, women, and children as research participants. Research on subject reporting and description will also be reviewed.

College Students as Research Participants

R.G. Smart (1966) examined the types of bias operating in subject selection in psychological research. Smart's (1966) research looked for evidence in a systematic way to support the idea that psychological knowledge was derived primarily from studies of college sophomores. Articles from two major American Psychological Association journals were examined for information concerning the types of subjects used. Non-psychiatric human groups in every article in volumes 64-67 of the *Journal of Abnormal and Social Psychology* (1962-1964) (J.A.S.P.) and volumes 65-68 of the *Journal of Experimental Psychology* (1963-1964) (J.E.P.) were examined and classified. Subjects were classified into seven categories including introductory psychology students, other college students, high school students, public school students, preschool students, samples of general population, and special adult groups. Data indicated that 73% of the 342 studies examined in J.A.S.P., and 85.7% of the articles in J.E.P. used college students as subjects in experiments. Non-school and subjects from the general adult population appeared to be ignored in these articles with merely a 0.6% in J.A.S.P. and 0% in J.E.P.

Smart (1966) pointed out that with the use of college students as prime research subjects, about 80% of the research studied was performed on only 6.3% of the total

population who attended college in Canada. This research finding was based on an estimate for Canada derived from the 1961 Census of Canada. Another finding was that there was an over-representation of male subjects in the articles examined. According to Smart (1966), in the area of social and personality psychology the subjects were predominantly male college students as represented by analysis of J.A.S.P. articles. This result was also discovered in the area of basic psychological research as represented by the J.E.P. Smart (1966) further disclosed that this type of subject selection bias was also found in other journals including *Psychological Reports* and *American Journal of Psychology*. Smart (1966) raised concerns about the consequences of such a bias toward the use of college students as participants, indicating that they were not representative of the general adult population.

Higbee and colleagues conducted a series of studies concerning some research trends in social psychology during the 1960s and 1970s (Higbee & Wells, 1972; Higbee, Lott, & Graves, 1976; Higbee, Millard, & Folkman, 1982). As an extension to Christie's (1965) discussion of research trends based on analyses of 139 articles published in the J.A.S.P in 1949 and 1959, Higbee and Wells (1972) analyzed 132 articles published in the 1969 issues of the *Journal of Personality and Social Psychology* (J.P.S.P.). The articles were categorized into three areas including research design, statistical techniques, and subjects. Higbee and Wells (1972) observed an increase in using college students in research from 20% in 1949 to 76% in 1969, and a decrease of using general adult population from 27% in 1949 to 9% in 1969 in J.P.S.P. Similar results were obtained by Schultz (1969) in his review of the same journals for the period of 1966 to 1967, indicating that there was a heavy usage of college students as subjects and an extremely small percentage of studies sampling the general adult population.

A further analysis by Higbee, Lott, and Graves (1976) showed that the use of college students did not decline in articles published in the 1970 to 1972 issues of J.P.S.P. This review was done on additional journals (*Journal of Social Psychology*, *Journal of Experimental Social Psychology* and *Sociometry*) and additional years since the researchers believed that generalizations made from their previous study was limited by the fact that they surveyed only one journal for only one year. According to these

authors, the predominant use of college students as subjects did not affect the generalizability and relevance of the studies.

With continued interest in these methodological issues, Higbee, Millard, and Folkman (1982) conducted another study employing four mainstream social psychology journals over the period extending from 1978 to 1979 to compare with the data of their previous analyses. Using the same categories as in previous studies (Higbee & Wells, 1972; Higbee et al., 1976), 639 articles were analyzed. Although there were differences among the journals, college students continued to predominantly serve as subjects in research, more than all other sample categories combined.

Sears (1986) suggested that the over-dependence on "a narrow data base of college student subjects tested in the academic laboratory with academic like materials" (p.515) might result in a distorted portrait of human nature, and flaw the conclusions of the science of psychology. He cited research in social psychology that occurred around World Was II which used a wide variety of subject populations and research sites. For example, Lazarsfeld, Berelson, and Gaudet (1948) investigated radio listeners and voters; Cartwright (1949) looked at the civilian end of the war effort; Festinger, Schachter, and Back (1950) investigated residents of housing projects; and Coch and French (1948) studied industrial workers in factories. These research designs were compared to later generations of research designs which focused on the use of laboratory experiments and college sophomore as research subjects.

In his study, Sears (1986) coded 301 articles published during 1980 and 178 articles during 1985 in three sociopsychological journals including the *Journal of Personality and Social Psychology, Personality and Social Psychology Bulletin*, and *Journal of Experimental Social Psychology*. Subjects were coded into four categories: North American undergraduate psychology students, other North American undergraduates, other school related students, or adults. The site of the research was coded as either laboratory or natural habitat. Findings indicate that North American college undergraduates were the most popular choice of subjects in research. In 1980, 75% of the studies coded used undergraduates as subjects and 53% of them were from psychology classes. Other school related students made up 7% , and adults 18% of the studies. The

1985 analysis showed very similar results in heavy reliance on undergraduate subjects in laboratory experiments.

Further analysis (Sears, 1986) of subject population in prestigious research in selected texts in social psychology revealed an increase of college students subjects from 32% in pre-1960 research to 63% in post-1960 (1965-1982) research. These numbers were based on 121 articles and 165 articles, respectively coded for the two periods of research in social psychology. Results from these content analyses indicated that college students were the most likely participants in published research in the selected books of readings between 1965 to 1982.

Minorities, Children, and Females as Research Participants

In 1992, Sandra Graham raised concerns about research based almost exclusively on white, middle-class people. Graham's analysis included six respected APA journals in the development, educational, clinical, and social/personality fields. These APA journals were content-analyzed for the status of African-American research between 1970 to 1989. Journals included were *Development Psychology, Journal of Educational Psychology, Journal of Personality and Social Psychology, Journal of Applied Psychology, Journal of Consulting and Clinical Psychology,* and *Journal of Counseling Psychology.* All the empirical articles published in these six journals for a 20-year period were reviewed, and articles about African-Americans were coded in detailed categories. Graham (1992) found that the overall percentage of studies on African-Americans was only 3.6%, with a steady decrease from 5.2% in the 1970 to 1974 publication period, and to 2.0% in the 1985 to 1989 period. In total, of the 14,542 articles examined, 526 dealt with African-Americans. Further analyses were done on these African-American articles including topics, methodological characteristics, socioeconomic status of subjects, experimenter race, and the use of brief reports. Graham (1992) argued that there had been a growing exclusion of research on African-American participants in the major journals. According to Graham (1992), mainstream psychology is "in danger of becoming raceless" (p.629) in the 1990s.

Also on the issue of racial and minority research, Ponterotto (1988) conducted a content analysis on the *Journal of Counseling Psychology* over the 11-year period from 1976 to 1986. Of the 934 articles and brief reports published, 53 (5.7%) had a racial/ethnic minority focus. When non-ethnic characteristics of the samples of the 47 articles with racial and ethnic focus were examined, it was found that 83.6% of the samples were students, and only 16.3% were non-students. This characteristic of over-reliance on student samples appeared to be common in research. One major criticism of heavy reliance on student samples was that they were not reflective of the larger non-student, lower income minority populations. For example, Scherman and Doan (1985) reviewed counseling research in the *Journal of Counseling Psychology* over a 5-year period and found that 60.4% of the samples were college students and therefore not necessarily reflective of minority populations.

In the area of developmental research, White and Duker (1973) provided some information about samples of children. A total of 207 articles from the journals *Child Development, Journal of Educational Psychology, Psychology in the Schools*, and *Developmental Psychology,* published between 1964 and 1970, were surveyed. It was found that very little information was provided regarding the samples, making it hard to evaluate the representativeness of the samples. Some results indicated that developmental research subjects tended to be drawn from middle-class or university-affiliated schools. White and Duker (1973) stated "Psychology professors practice research on the most readily available bodies: their graduate students, their colleagues' children, their graduate students' children, and those children that live near the university" (p.703). It appeared that researchers frequently used available samples of convenient subjects in their experiments.

Low and Joliceour (1994) assessed the progress of women participants in health-related research. They reviewed 1050 articles published in the *New England Journal of Medicine,* the *American Journal of Psychiatry,* and the *Journal of Consulting and Clinical Psychology* in 1982, and again in 1991-1992 to determine if women participants had increased. Findings indicated that in health-related research, particularly in medical research, women had been underrepresented. For example, Blanchard and Griebel

(1995) observed gender bias in pre-clinical research of psychopharmacology of anxiety which was considered to be a predominantly female disorder. It was found that studies were based mostly on male subjects when female subjects should have been included since preliminary research had suggested gender differences in the mechanisms of behavioral and physiological responses to stress and threat.

In other research, Crawford and Marecek (1989) discussed 'womanless' psychology of the past 50 years of psychological research. They stated that 'womanless' psychology was "reflected in the disproportionate use of males as experimental subjects" (p.149). Historically, researchers have demonstrated a preference for male subjects (Smart, 1966). This consistent preference would result in "the construction of theories and models of behavior that have little or no relevance for females" (McHugh, Koeske, & Frieze, 1986, p.884).

Reporting and Description of Research Participants

It appeared, as well, that description of research participants had been neglected in published reports. Schultz (1969) found that 3.6% of the articles published in the *Journal of Experimental Psychology* between 1963 and 1964 did not mention where the subjects were obtained, who they were, and if they were male or female. Although the neglect was noted by Schultz in a small percentage of articles, this becomes noteworthy in a field that prides itself on clear description. Over the years there had been a number of studies (e.g. Betan & Roberts, 1995; Miller, 1987; Phares & Lum, 1996) on the reporting and description of subjects as well as suggested standard of reporting in different areas of research. It would be useful to first review the guidelines regarding subject reporting proposed by the American Psychological Association.

APA Guidelines on Subjects Description

The description of research participants is found in a subsection of the method section in reports of empirical studies. The third edition of the Publication Manual (1983) suggested the content of the subjects subsection as follows:

> The subsection on subjects answers these questions: Who participated in the study? How many participants were there? How were they selected? Give the total number of participants and the number assigned to each experimental condition. If any participants did not complete the experiment, give the number of participants and the reasons they did not continue. When human are the participants, report the procedures for selecting and assigning subjects and the agreements and payments made. Give major demographic characteristics such as general geographic location, type of institutional affiliation, sex, and age (p.26).

Compared to the third edition, there is less direction in the fourth edition of the Publication Manual (1994):

> Appropriate identification of research participants and clientele is critical to the science and practice of psychology, particularly for assessing the results (making comparisons across groups), generalizing the findings, and making comparison in replications, literature reviews, or secondary data analyses. The sample should be adequately described, and it should be representative (if it is not, give the underlying reasons). Conclusions and interpretations should not go beyond what the sample would warrant. When humans are the participants, report the procedures for selecting and assigning them and the agreements and payments made. Report major demographic characteristics such as sex and age. When a particular demographic characteristic is an experimental variable or is important for the interpretation of results, describe the group specifically - for example, in terms of racial and ethnic designation, national origin, level of education, health status, and language preference and use (p.13).

Gall, Borg, and Gall (1996) observed that traditionally, the individuals in a sample are referred to as subjects in research reports. However, the fourth edition of the Publication Manual (1994) recommended changing the term "subject" to more descriptive terms:

> Write about the people in your study in a way that acknowledges their participation. Replace the impersonal term subjects with a more descriptive term when possible - participants, individuals, college students, children, or respondents, for example.... (p.49).

The heading of this subsection had been shifted from "Subjects" to "Participants" in many research reports published in recent years as a result of following the recommended guidelines.

Reporting of Children Samples

In their review of developmental journal articles, White and Duker (1973) stated that all children were not alike, and they could behave differently due to attributes such as sex, race, background and other variables. There was a need to know how and from where they were selected in order to understand what the samples represent. Of the 207 articles they examined, White and Duker (1973) found that "the journals' reporting of the characteristics of children is a hit-and-miss affair" (p.700). All of the 207 articles (100%) reported the number of subjects in the samples, 67% reported sex, 61% age, and 62% grade of children. References made to the school or institution that the children attended were found in 77% of the articles. However, the references were often vague and meaningless, referring to "a public school", or "a suburban school district", perhaps attributed to the need for anonymity required by research ethics review board.

There was little information regarding the social economic status (SES) of samples using children. White and Duker (1973) found that out of 31% that reported social class, 29% were without supporting data or any objective measurement. For example, the description "a school in a middle class residential area" was often given without mentioning how "middle-class" was measured. This could be due to the fact that there is a known standard method for discerning SES in the United States via the lunch programs which was not specified in the articles. None of the articles used any census tract data which could provide a lot of background information and would be readily available.

White and Duker (1973) also discussed how some psychologists argued against reporting certain characteristics of children in their samples. Some argued it was unimportant to report characteristics such as the SES, background of parents, ethnicity; still others felt that it was discriminatory to report such data. However, McLoyd and Randolph (1984) pointed out that information about the social class of Afro-American children was essential to describe the samples adequately. White and Duker (1973) wrote

"until we have done our homework on the variables that coincide with behavioral differences in children, we have an obligation to report those that are available and relevant" (p.702).

As for the selection of sample, only 40% of articles reported how an individual child was selected, and 29% (61 out of 207) provided information about the types of schools sampled. White and Duker (1973) suggested some standard characteristics for reporting samples of children such as all the background information, school information including test scores, and details regarding how the sample was selected. There was also a recommendation that the editors of journals require and insist on better reporting of sample characteristics. It appears that while considering the issue of anonymity in research ethics, it is still possible to provide more adequate information about samples.

Miller's (1987) survey of articles published in *Child Development* and *Developmental Psychology* found that, in reporting sample characteristics, researchers often used vague phrases such as "approximately" and "predominantly white" rather than describing the characteristics more specifically.

Miller (1987) pointed out that researchers often failed to say anything about how samples were recruited. A number of important questions regarding sample recruitment were listed. It was important to ask what the initial pool from which subjects were solicited, the percentage of potential participants who did in fact agree to participate, and how many or what percentage stayed with the research. In his survey, Miller (1987) found that only 12% reported with exactness how their samples were recruited, and disclosed the proportion of those who agreed to participate from all potential participants. Also, 36% reported the number of subjects who did not complete the experiment. In general, Miller (1987) observed that subjects in developmental psychology were predominately white, middle-class, and lived in cities near universities. Blacks were used only for specific focus of research, and children living in inner city and rural settings were underrepresented.

In a more recent content analysis of journal articles published in 1992 in the *Journal of Clinical Child Psychology* and the *Journal of Pediatric Psychology*, Betan, Roberts, and McCluskey-Fawcett (1995) found that the majority of articles did not report rates of

participation or provide adequate information about sample characteristics and the characteristics of the research process such as population type, setting of sample, participant pool identification, and participant recruitment. Betan et al. (1995) emphasized the importance of reporting the rate of consent in research involving children. Consent rate is defined as "the proportion of those individuals initially approached in the population about research participation that is represented by the final sample in a study" (p.228). It was stated that "selective nonparticipation as a result of consent procedures" and "self-selected samples" may be "creating a significant bias in children participant samples"(p.228). With limited information readers would not be able to assess the representativeness of samples and generalizability of the findings of child research.

In a 1996 study, Phares and Lum reviewed sample demographics in 684 articles published for the years 1990 through July of 1994 in four journals dealing solely with clinical issues in childhood and adolescence and two APA journals that publish clinical child research amongst other research. Data collected on sample demographics from these articles indicated that 80.4% of the studies did not include any mention of parental marital status, and 36.7% did not include SES, race, or ethnicity of the participants. In addition, the authors found a lack of consistency in the presentation of family demographic data in the published research findings. Phares and Lum (1996) suggested that "at a minimum, researchers should include information about gender, age, family constellation, race, ethnicity, and SES in research involving children and family", and "in addition, any other demographic variables that might influence the interpretation of the results of that study should be included" (p.799).

Reporting Standards in Varied Populations

In his review of minority samples, Ponterotto (1988) found that only 30.6% of the studies surveyed described social economic status characteristics of the sample. He stressed the importance of describing SES of minority samples even though many of these samples were university-based and were taken for granted as middle-class samples. Ponterotto (1988) stated "Given that individual students at universities can be quite

heterogeneous with regards to family and personal income, it appears that an adequate SES description of the sample is usually warranted" (p.414).

In the experimental literature in aphasia, Brookshire (1983) observed that there was great inconsistency in reporting how subject samples were selected and described. He studied 52 reports involving adult aphasic subjects in five journals in the 1970s and early 1980s and found striking inconsistency across journals concerning the report of various subject characteristics. Overall, age of subjects was the only characteristic reported in 91% of the articles, and no other subject characteristics were reported in more than 65% of the articles. Characteristics important to aphasic research such as severity of aphasia, duration, type of aphasia, etiology, and lesion lateralization were reported in only 49% to 64%of the studies. Gender, education, and source of subjects were reported 48%, 35%, and 28% of the studies respectively.

Brookshire (1983) further discussed the importance of adequate description of subjects. Inadequate description was found to have negative effects on generalization to other groups and potential replication and extensions of experiment by other researchers. Several characteristics were suggested to be routinely included as basic information about the subjects in published reports. These were age, education, source of subjects, gender, and variables specifically related to aphasia including lesion location, handedness, etiology, time postonset, severity of aphasia, and type of aphasia.

In another study reviewing child language intervention literature, Wickstrom, Goldstein, and Johnson (1985) tried to determine the content and consistency of subject description. They analyzed 40 articles on language intervention studies from seven journals published between 1978 and 1983 using various categories of variables. The 21 categories used for analysis include general demographic variables, language variables, nonlinguistic development and status variables and other variables. It was found that out of 21 variables, age, sex, and diagnosis were reported consistently at 100%, 93%, and 83% respectively. There was great inconsistency found in the amount of information on variables reported not only across journals but also within them.

Wickstrom et al. (1985) found such subject description practices unacceptable and believed that it should be a cause for concern. They stated "more comprehensive

descriptions should assist others to more adequately interpret, employ, and extend research findings" (p.283). Due to the lack of standards and guidelines, the authors suggested some important areas to be included in subject description which might include "subject selection criteria, language assessment results, diagnosis and etiology, development and behavioral history, learning and intervention history, and demographic characteristics" (p. 283).

In a later report, Schmitt and Meline (1990) came up with 18 variables to analyze subject description in addition to the 21 variables used by the previous researchers. They reviewed 92 reports on language-impaired children published in six journals from 1983 to 1988 and found very little consistency among and within journals. Published reports often did not describe important variables. In fact only seven of the variables were found to meet the criteria of "standard" subject description occurring 75% of the time or more in these language-impaired children research. The authors suggested that researchers should describe important demographic, language, and nonlinguistic information about their subjects to enhance replicability and external validity of their studies.

The research committee of the Council of Learning Disabilities (CLD) noted in 1984 that subject description in learning disability research reports were vague and inconsistent, and recommended some guidelines for reports. However, the concern remained eight years later, and again the committee attempted to identify the minimum standards for subject description in 1992. It was suggested that at a minimum, information to be included in subject description should include the number of subjects, gender, age, race or ethnicity, intellectual status, and subjects' relevant achievement levels (CLD, 1992). The research committee also believed that "journal editors can exercise their influence in assuring better participant descriptions ...." and "minimum standards for description of subjects in learning disability research are essential data and that every reasonable effort should be made to provide this information" (CLD, 1992, p.69).

In summary, research has shown the inadequacy of subject reporting and description. Essential demographic information and sample selection procedures were omitted from many research reports. Despite of the concern of some researchers, there is

still a lack of consistencies and guidelines for more complete reporting of sample characteristics.

Research on Subject Characteristics

Characteristics of College Students

Use of college students as research participants had been found to be a common practice in many areas of psychological research. Schultz (1969) studied the nature of human subjects and found that there were important consequences in using college students as the primary focus of research. He stated that college students would never be truly representative of the total adult population in a number of ways. Smart (1966) also believed that college students differ from non-college population in a wide variety of characteristics of crucial importance to many aspects of psychology. Sears (1986) called the use of college students a "narrow data base", and discussed in detail how college students differ systematically from other late adolescents and the general adult population.

One characteristic of college students is that they usually represent a narrow age range, primarily between ages 18 and 24. Also, they are "concentrated at the upper level of educational background" (Sears, 1986, p.521). Smart (1966) commented, "such students are probably at the peak of their learning and intellectual abilities and this could mean that many findings in learning, especially verbal learning, could be special to the college students with limited applicability to other groups" (p.119). Smart (1966) also noted that some might argue that the learning principles would be the same in any group. However, it would be difficult to know this as the question had not been investigated.

Another characteristic of college students observed by Schultz (1969) and Smart (1966) was that they tend to come from upper and middle-class families. Differences had been found, for example, in child rearing practices, social skills, and other factors in families of different social economic status (Smart, 1966).

Sears (1986) observed several other characteristics of college students that were relevant in particular to the area of social psychology. Describing the "narrow data base", he cited research and stated that college students do not have a firm sense of self as older

adults do (Erikson, 1963), and have less crystallized social and political attitudes than do older people (Jennings & Niemi, 1981; Kirkpatrick, 1976). Sears (1986) also found students to have "usually strong cognitive skills, strong needs for peer approval, and tendencies to be compliant to authority" (p.527). In addition, college students' behavior is found to be easily socially influenced, they readily change their attitudes and their self-esteem is fragile. Ross, Green, and House (1977) also found evidence of "false consensus effects" in late adolescent participants. False consensus effects are egocentric biases in which one's own behavior or attitudes are seen as typical of everyone else's. These findings suggest that college students are susceptible to influence, and this could have an important impact on research results, especially in the area of social psychology.

This research suggests important differences between samples of college students and the general population. Such differences imply that "much research in social psychology does not generalize beyond college students" (Kreiner, Alvarado, & Shockly, 1997, p.516).

Characteristics of Volunteer Subjects

The "narrow data base" of college students become even more "narrow" under closer inspection - most of them volunteer to participate in psychological experiments. Robert Rosenthal (1965) did a thorough analysis on the volunteer subject and found evidence of differences between volunteers and non-volunteers. In analyzing the act of volunteering, Rosenthal (1965) pointed out that "offering one's service as a subject in a psychological experiment is not a random act" (p.390). Rate of volunteering and the willingness to volunteer might increase or decrease due to many factors. Rosenthal (1965) postulated that "one major variable contributing to the decision to volunteer to participate in either an experiment or a survey is the subjective probability of subsequently being favorably evaluated by the investigator" (p.391). This appeared to relate to Sears' (1986) observation of late adolescents who have incompletely formulated their sense of self, and are therefore more likely to comply to authority and have egocentric biases.

As for volunteer characteristics, Rosenthal (1965) and Rosenthal and Rosnow (1975) summarized findings that differentiate volunteers from non-volunteers in psychological research. They stated with some degree of confidence that volunteers tended to manifest greater intellectual ability, interest, and motivation. This seemed to match the characteristic of college student subjects described by Sears (1986). It is not surprising since volunteer subjects described by Rosenthal (1965) and Rosenthal and Rosnow (1975) were mainly college students subjects. Volunteers were found to be younger, (particularly the females), more unconventional, less authoritarian, more sociable, and to manifest greater needs for social approval. They were also found to perform better in difficult motor task, to be better educated, and to have earned higher grades at college (Rosenthal, 1965; Rosenthal & Rosnow, 1975). There were also many other variables that needed further investigation including the need for arousal, birth-order, and gender differences in anxiety, adjustment, and conforming levels of volunteers.

Rosenthal (1965) concluded that it was very likely that a sample of volunteer subjects would differ from the unsampled non-volunteer in any psychological experiment. One implication was that, in terms of subject selection procedure, this was a violation of the requirement of random sampling and thus placed limitations on the generalizability of the findings. The effect of using volunteer subjects was little known. It was suggested by Rosenthal (1965) that there should be investigations using both volunteers and non-volunteers to find out if the use of volunteer subjects did indeed make a difference. Rosnow and Rosenthal (1997, 1999) stated that even when the volunteers are randomly assigned to the experimental and control conditions, the use of volunteers may still lead to biased conclusions.

Personality differences between responders and non-responders to a survey questionnaire was reported by Lubin, Levitt, and Zuckerman (1962). In a more recent study, Green (1991) found that when 600 classroom teachers were surveyed on the use of research and attitudes toward research, there were differences between early and late responders, as well as non-responders. When interviewed by phone later, the original non-responders were found to have a less positive attitude toward the topic and less favorable views of themselves as researchers and teachers.

Studying personality differences between volunteers and non-volunteers, Cowles and Davis (1987) discovered that interactions between characteristics were related to participation in research. Undergraduates were asked to indicate their willingness to volunteer for research, and were also tested on the Eysenck Personality Inventory. It was found that the students' scores on Neuroticism-Stability interacted with scores on Extroversion-Introversion. Those classified as stable extroverts were more likely to volunteer than those classified as stable introverts, but neurotic extroverts were less likely to volunteer than neurotic introverts.

Lasagna and von Felsinger (1954) discussed the use of volunteers to provide data as a "normal" baseline in clinical research. They served as a standard of reference against which data from abnormal subjects may be measured. In a pharmacological study, 56 subjects, mainly college students, between 21 and 28 years of age received unspecified drugs as part of the experiment. Analysis of the routine Roschach tests and psychological interviews done at the beginning revealed an unusually high incidence of psychological maladjustment among these subjects. This finding raised the question of the representativeness of a "normal" sample of volunteers from the population of college students.

Further discussion (Lasagna & von Felsinger, 1954), in examining the reasons for volunteering, showed that a number of volunteers participated in experiments primarily for monetary rewards. Other volunteered, hoping to find professional advice, or find a drug to help their problems. Some volunteered in search of new experiences, or to escape from personal problems and drives. The authors suggested that "generalization and predictions deserve to be exceptionally reserved when volunteers are the sole source of data" (p.360), and "an awareness of the problem involved and care in eliciting and describing data will help in avoiding error and improving precision" (p.361).

In studying memory characteristics of 80 college students who volunteered for research, Kreiner, Alvarado, and Shockley (1997) found significant differences in a number of memory abilities when this group was compared with the general population. The results provided evidence that researchers should be cautious in assuming that

samples of college-student volunteers were accurate representative of the population in memory abilities.

Other Literature on Research Participants

To investigate the role of incentives in psychological research, Brower (1948) tested two groups of college students on the use of a visuo-motor conflict apparatus. Fifty-nine students, recruited from an introductory psychology class of 135 students, were put in the voluntary group. Another 149 students from other sections of the course were required to take the experiment, making up the full number.

Experimental results revealed that there was considerable variation in the time and error score of the two groups even though the sample had been drawn from the same population. Data strongly suggested that differential motivation might be operating in the voluntary and compulsory groups within this study. Brower (1948) suggested the situation was such that "a large body of psychological data derived from the university laboratory represent widely heterogeneous and skewed groups", and "further research along these lines will be required to establish the limitations involved in the continued utilization of college students as subjects for psychological experimentation" (p.146).

Students' attitudes toward compulsory participation in experiments were studied by Gustav (1962) using a sentence completion test on 281 college students in introductory psychology classes. Responses were categorized into three groups: favorable, unfavorable, and factual responses. Favorable responses included expressions of interest, curiosity, and enjoyment about psychological experiments, being eager to sample an experience, and willingness to conform to course requirement. Unfavorable responses of the participants included expressions of annoyance, fear, feeling the pressure of time, boredom, nervousness, and disappointments. Factual responses from the participants indicated what happened objectively, not revealing the feelings of these participants. Gustav (1962) discussed possible ways in which experimental results might be distorted as a result of subject's attitudes towards compulsory participation in experiments. Subjects who reported they were bored or felt pressed for time would go through the motions in a superficial, perfunctory fashion. Those that were irritated might deliberately

change their responses in revenge for being imposed upon. Some were apprehensive about what would happen during the experiment and this fear and tension could change their responses. This study demonstrated the possibility of result distortion when college students face compulsory participation in experiments.

In a more recent study, Korn and Hogan (1992) conducted three experiments to study the effect of incentives and aversiveness of treatment on willingness to participate in research. Grade points (0%, 1%, or 5%) and monetary ($2 or $10) incentives were offered to participants. Effects of these incentives on their willingness to participate in hypothetical experiments involving varying degree of aversiveness were measured. Results indicated that willingness to participate was greater with larger incentives and lower for more aversive treatments.

The importance of reporting methods of recruitment was demonstrated in the research of Tomporowski, Simpson, and Hager (1993). Findings indicated performance of students who were recruited by the monetary incentive method were significantly higher on tests of sustained attention and recognition memory when compared to the course-credit incentive and the course requirement.

Due to course requirement and monetary incentives, college students had the opportunity to serve as subjects in many experiments. It had been found that previous experience as subjects had an effect on performance in later experiments (Orne, 1962). The relationship between the amount of experience the subject had in psychological research and their performance in later experiments was investigated by Holmes (1967). Findings indicated that experienced subjects were more aware of the reinforcement contingency in a verbal conditioning experiment, and they were also more cooperative. In another study, experienced subjects perceived experiments as more valuable and scientific, and they showed higher levels of intention to cooperate, when compared to less experienced subjects. Thus, subjects' perceptions, intentions, and performance in experiments were found to be affected by their experience levels.

It is known that university psychology programs often utilize some form of subject pool to recruit students as participants in research. Participation in more experiments could increase participant level of awareness, cooperation, and understanding of what is

expected of them, thus making participants experiment-wise. Holmes (1967) concluded from his studies that performance of the experienced subjects could be a source of bias like the bias of using mainly volunteer subjects.

Literature on Sampling Issues

Research methodology textbooks usually devote pages to the importance of random sampling and describing sampling issues and techniques (e.g. Gall et al., 1996; Goodwin, 1995; Ray, 1997). Since it is usually not possible to study all members of the populations in which they are interested, researchers have to test samples from which they can generalize to the larger population. An appropriately chosen sample is a part of a larger population and can be used to describe the larger population with varying degrees of accuracy (Plutchik, 1983). Statisticians have shown that using randomly selected samples would allow generalizations to be made about a population. In a random sample, every member of the actual or hypothetical population has an equal chance of being included within the sample.

The type of sampling procedure used by researchers often determines the external validity (Campbell & Stanley, 1966) of an experiment, that is, the extent to which findings can be generalized (Craig & Metze, 1986). Generalizability from a sample to the population depends critically on the representativeness of the sample. Shaughnessy and Zechmeister (1997) pointed out that "Selection bias occurs when the procedure used to select the sample result in the overrepresentation of some segment of the population, or conversely, in the exclusion or underrepresentation of a significant segment" (p.136). Often, researchers obtain the most easily accessible and convenient samples rather than select subjects through sampling techniques designed to yield generalizable results. Brookshire (1983) stated that "experiments which do not permit such generalization will be of limited value" (p.342).

For example, in analyzing the conduct and publication of research on Afro-American children, McLoyd and Randolph (1984) commented that the external validity of the majority of these studies was problematic because samples were not random and

descriptions of samples were inadequate. In fact, the authors were surprised that random sampling was so infrequent in the studies they surveyed.

An example of selection bias can be found in the area of psychotherapy research. It was reported that although minorities made up approximately 27% of the population of the United States according to the 1994 U.S. Bureau of Census, major psychotherapy studies had been based almost exclusively on well-educated and predominantly white sample populations (Miranda, 1996). The under-representation of minorities in psychotherapy studies could likely limit the ability to inform public policy regarding effective treatments for these minorities. It was believed that data collected appropriately from adequate samples of minorities in studies could help professionals to gain important knowledge and to ensure provision of services to these diverse populations.

Summary of Chapter 2

This chapter summarized the literature on research participants in various areas of psychological experimentation. Studies examined here used the content analysis method to estimate the use of college students, minorities, children, and females as subjects. It was revealed that there was a heavy dependence on college students as research participants, under-representation of minority and female participants, as well as inadequate reporting of information regarding children. Literature regarding the reporting and description of subjects showed that inadequate subject description was common. There were also research on characteristics of college students and volunteer as research participants, as well as other related issues including subjects' attitudes, experiences, and incentives to participate. College students were found to differ in a number of characteristics when compared to non-college populations, and volunteers were different from non-volunteers in a variety of ways as indicated by research. Also, it was shown that subjects' attitude towards experiments could distort experimental results, experiences in participating could affect performance, and larger monetary incentives results in better performance as well as higher willingness to participate in more aversive conditions.

The literature on research participants focused on select participant types using very short or brief period of time. The general impression portrayed was that the human subjects who provided data for most psychological research were primarily white, male, college students who volunteered or were required to participate rather than randomly selected subjects representative of the general population. Compared to previous research which used limited time frame and narrow focus, this study proposes a more extensive and broader examination of the history of subject use. By examining participant types and reporting using systematic and methodical procedures, this proposed study intends to find out the changes and extent of subject selection bias through the history of psychology in the twentieth century.

The following chapter will outline the method of this study including a description of content analysis as a research technique in general, and a detailed discussion of the procedures and coding categories to be used in this study.

CHAPTER 3 - METHODOLOGY

This chapter describes the archival research methodology of content analysis which is a systematic archival research technique. The research design as well as the methods of data analysis will be outlined.

Archival Research

To investigate the historical content of psychological research, this study will use a technique of archival research and content analysis. Archival research has been firmly established as a research tradition in the behavioral sciences (Dane, 1990) and it uses information that has already been collected for some other purpose. Bordens and Abbott (1996) called it a "nonexperimental strategy that involves studying existing records" (p.162).

Since archival materials contain an overwhelming amount of information, researchers should have specific research questions in mind and focus on specific aspects of the material. It was stated by Bordons and Abbott (1996) that archival research is purely descriptive, and researchers are able to identify trends or correlations. Archival researchers work with information generated before the research began and deal with people's products rather than with people themselves (Dane, 1990). Archival data are encoded in various forms of written documents as well as visual and audio media, ranging from public information such as census data, newspaper, journal articles, court records, to private information such as health history data, educational records, and diaries.

The most obvious advantage of archival research is the amount of information available that allows access to behaviors and practices that would otherwise be unobservable. Archival research can also converge with results of laboratory research to increase external validity. Since the information exists already, archival information is nonreactive, eliminating the possibility of subject reactivity in the collection of data (Goodwin, 1995; Shaughnessy & Zechmeister, 1997). Subject reactivity occurs when the

subjects' knowledge of being observed would influence their behavior (Goodwin, 1995), and thus would affect the results of the experiment.

However, archival research also presents some disadvantages that can create problems for researchers. Even though a vast amount of information is available, access to some pertinent records may be difficult or impossible. Thus, the data available might not be a representative sample. Another disadvantage of archival research is that the accuracy and appropriateness of the data depend entirely on the people who created the records (Heiman, 1999). Heiman (1999) states that archival data "may contain verbose, open-ended description requiring much subjective interpretation on our part" (p.337). Researchers can "attempt to quantify such description using content analysis, but different record keepers may give such different descriptions that a consistent, reliable approach is not possible" (Heiman, 1999, p.337).

As in other research methods, experimenter bias can pose a problem with archival research, with researchers selecting only those records that support their hypotheses, and interpreting content in ways that are biased by their own expectations (Goodwin, 1995). This is not an easy problem to avoid completely because of the vast amount of data available that can often be open to different interpretations. To reduce the effects of bias, there is a need for development of specific plans and systematic methods to work out careful procedures and operational definitions of the variables. It is also necessary to establish criteria for finding records, obtaining samples, transforming the collected information into usable data, analyzing those data, and using the results to draw conclusions (Goodwin, 1995; Heiman, 1999).

Content Analysis

Content analysis is a systematic archival method which involves the use of any communication medium in written, audio, visual, pictorial, or oral forms. The unit of analysis in content analysis is found in records rather than the behavior of subjects. Berelson (1952) defined content analysis as "a research technique for the objective, systematic, and quantitative description of the manifest content of communication" (p.18). It is also a technique for "making inferences by objectively identifying specific

characteristics of messages" (Shaughnessy & Zechmeister, 1997, p.173). Content analysis is used to analyze written or spoken records for the occurrence of events, items, or behavior, and even though simple in appearance, it can become as complex as any other research technique. Content analysis is an observational technique in essence, and all factors involved in observational research also apply to content analysis (Bordens & Abbott, 1996). It should be performed within the context of a well developed research idea and design, including clearly defined response categories and methods of quantifying data.

Holsti (1969) described three defining characteristics of content analysis. First, it should be objective with each step guided by an explicit set of rules or procedures. This is necessary to eliminate any subjective influence of the researcher and adhere to rules by which data will be collected and categorized. Second, content analysis should be systematic when information is assigned to predetermined categories including data favorable and unfavorable to the researcher's position. Third, content analysis, rather than generating disconnected facts, should have generality in which findings should fit within a theoretical, empirical, or applied context (Holsti, 1969). It was also pointed out that components such as changes in content over time and the extent of the content conforming to some external standard would be important for investigating the content communicated in a message (Holsti, 1969).

The first step in performing content analysis is the identification of documents relevant to the research purpose. It is also important to specify research questions, or hypotheses, or objectives, and select representative samples of documents to analyze (Gall, et al., 1996; Shaughnessy & Zechmeister, 1997). Since the content analysis of a biased sample may produce biased results, it is necessary to use relevant material to ensure validity of results. Like other research designs, generalizability of results from the content analysis technique depends on the nature of the sample used.

It is also important for researchers to carefully define the response categories which should "reflect the purpose of the research, be exhaustive, be mutually exclusive, be independent, and be derived from one classification system" (Bordens & Abbott, 1996, p.164). Clear operational definitions of terms and categories are most important.

Categories should not be too narrowly defined or be overly restrictive, allowing meaningful categories relevant to the hypothesis to be included (Bordens & Abbott, 1996).

In performing content analysis the research will also need to decide on units of analysis, units of observation, sampling techniques, and coding before starting data collection. The units of classification for quantitative analysis can include words, phrases, themes, and units such as space and time, and any other units of relevance pertinent to answering the research question. Dane (1990) suggested that researchers should establish a systematic sampling procedure which could provide a representative sample from which generalization to the entire set of observation units is possible. The planned procedure could involve sequential and at-random choosing of, for example, a day of the week, or a time period.

It has been pointed out that clear and explicit rules must be developed in content analysis so that two raters coding the same material independently will have similar ratings (Leary, 1995). Bordens and Abbott (1996) suggested that experimenter bias could be a problem when the analysis is done by the researcher who knows the hypothesis or has a particular point of view. Evaluating interrater reliability can be used to prevent such a bias.

The type of quantification procedure one selects for content analysis depends on the units of observation and coding procedures selected (Dane, 1990). The most common procedure is to measure frequency, this involves counting the number of times a given variable appears in the observational unit. Relationships among variables could be discovered when it is determined that certain items show up more often than others. Other procedures include measuring the amount of space used in written material, or the amount of time in audio or visual materials appropriated to the variables.

In considering the limitations of content analysis, Bordens and Abbott (1996) found this type of research to be purely descriptive, and causal relationships cannot be established among variables. Also, sometimes there could be a problem with the durability of findings, and the results from a content analysis could be invalidated over time. For example, Bordens and Abbott (1996) cited Greenberg's (1980) content analysis

of prime-time television shows revealed that when compared to Whites, Blacks were portrayed often as having lower-status jobs and athletic physiques. An updated content analysis in the 1990s would probably show Greenberg's findings to be no longer valid because at present Blacks are more likely to be portrayed in higher status roles than in the past.

From the vantage point of time, even though results from content analysis could be invalidated eventually, the changes that occur over time would be valuable information for a broader examination of specific issues. Using the Greenberg (1980) example, researchers could examine whether changes had occurred in the media portrayal of Blacks between the 1970s and the 1990s, why those changes happened, as well as study attitude changes in the society, and other implications relating to the shift. From this point of view, it is believed that any content analysis can stand the test of time simply because it provides invaluable information for a specific variable or issue from a particular time in history. This information could be meaningful and useful, to promote better understanding of an issue, allowing further investigation and research.

Research Design

Method

Using the content analysis research method and taking a historical perspective, this study on subject selection and reporting analyzed research published in three mainstream psychological journals in 20 years intervals over the last 80-90 years in the fields of basic, educational, and developmental research. This examination focused on changes in subjects selection and reporting over the years.

Samples

Journals analyzed in this research will be selected by their 'age,' the length of publication, and ratings of quality. They include the *Journal of Experimental Psychology* (J.E.P), first published in 1916, and *Journal of Educational Psychology* (J.Ed.P.), first published in 1910. *Child Development* (C.D.), first published in 1930, is also examined to find out which children were used as subjects in developmental research. These three

journals are mainstream outlets of psychological research in their fields, maintaining a high standard for publication from the early years to the present time.

Much effort was devoted to determine a relative ranking of psychological journals in the 1970s. This included evaluations from psychology department chairs (Mace & Warner, 1973), members of the APA (Koulack & Keselman, 1975), and members of the Society for Research in Child Development (SRCD) (Peery & Adams, 1981). According to the summary of seven separate rankings by Porter (1978), each of the three journals selected for this study were ranked highly, in the top 25 journals on average. Also, ratings by the members of the APA (Koulack & Keselman, 1975) ranked these journals among the top 20 journals in terms of excellence. In the qualitative ratings of human development journals, SRCD members were asked to list the ten best journals and rank them, C.D. received 284 nominations and ranked first, becoming the most frequently nominated developmental journal (Peery & Adams, 1981).

Taking a historical perspective, these three journals were systematically sampled in 20-year intervals. The choice of the 20-year intervals is based roughly on the main trends and currents in the history of psychology as outlined by Leahey (1997). In the 1910s, the period of the First World War, Watson proclaimed his manifesto. The behaviorist era lasted from the 1910s to the 1950s, with its development between the 1910s and the 1930s, and the formulation of behaviorism taking place between the 1930s and the 1950s. The 1950s marked the post World War II era, when behaviorism settled into eclecticism, and cognitive science began with the emergence of early cognitive theories. Leahey (1997) called the period between 1958 to 1978 the years of turmoil when behaviorism was being challenged, humanistic psychology took off, and cognitive psychology asserted itself. The era of the 1970s to the 1990s is a period of contemporary psychology dominated by the cognitive science. From the history of psychology, it appears that ideas and trends take about 20 years to develop and settle in, and for changes to be noticed.

Starting from 1997 backwards, J.E.P. and J.Ed.P. were sampled from the years 1997, 1977, 1957, 1937, and 1917. J.E.P. had been divided into several separate journals since 1975, and this study will sample the J.E.P.: General in the 1977 and 1997 volumes. C.D. was sampled from the years 1997, 1977, 1957, and 1937, but not 1917 as it began in

1930. The following table shows the approximate number of articles published in each of the years in each of the journals being sampled:

Year	J.E.P.	J.Ed.P.	C.D.
1997	22	64	74
1977	24	100	236
1957	69	59	43
1937	101	77	42
1917	32	40	--
total	248	340	395

To choose an adequate sample size, it is first determined that the target population of this analysis is the total number of articles published in the three journals estimated to be approximately between 15,000 and 20,000, based on the yearly averages. According to the sample size table (Krejcie & Morgan, 1970), a sample size of 377 is needed for a finite population of 20,000 at a 95% confidence level.

With the great variation in the number of articles published in the 14 volume / sample in the above table, it was determined that the first 28 articles in each volume would form the sample for that year (28 x 14). This resulted in a total of 392 articles sampled. When the total number of articles in any volume is less than 28, articles in the following volume were added. Only empirical research articles were analyzed, excluding commentaries, meta-analyses, and any articles that did not directly use participants. Thus, the actual total number of usable articles was fewer than 392 based on the availability of articles, but more than the sample size of 377 as suggested by Krejcie and Morgan (1970).

The "Subjects" or "Participants" section of each article was the unit of analysis, or the recording unit (Holsti, 1969) in this study. As suggested by Dane (1990), there is the need to establish a systematic sampling procedure that involves random choosing in a sequential manner. This is to avoid having to observe everything included in the unit of analysis, and to provide a representative sample from which the researcher can generalize to the entire set of observational units.

Coding Categories

The categories selected for coding are based on the suggested content of the subject subsection as outlined in the third edition of the *Publication Manual* of APA (APA, 1983). The third edition gave more directions than other editions on the topic of subject description. It was suggested that researchers describe who participated in the experiment, how many subjects there were, how subjects were selected, numbers assigned to each condition, numbers who did not complete the experiment and the reasons, payment agreement, and demographic characteristics including age, sex, type of institutional affiliation, and general geographic location. The following categories were used in this study to code subject descriptions in the articles sampled:

1. Number of subjects
2. Gender - number of males and females
3. Age
4. Who participated? - e.g. students, patients, etc.
5. General geographical location
6. Type of institution - e.g. universities, day-care centers, etc.
7. Assignment to conditions
8. Procedure for selection
9. Rewards - e.g. course credit, payment, etc.
10. Exclusions and reasons
11. Race or ethnicity
12. Social economic status (SES)
13. Other information - e.g. test scores, level of abilities, etc.

Each article was coded using these categories. To illustrate the procedure, the following is an example of the coding using an article from J.E.P.: General on recognition and recall (Rabinowitz, Mandler, & Patterson, 1977). The subsection in the method section of that article stated:

> Forty-eight undergraduates at the University of California, San Diego, participated in the experiment as part of an introductory psychology course requirement. There were 12 subjects in each of the four groups. Subjects were run individually (p.306).

The coding done on the above is shown below:

1. Number of subjects	48
2. Gender	unknown
3. Age	unknown
4. Who?	undergraduates
5. General geographical location	San Diego, CA
6. Institution type	university
7. Assignment to condition	12 x 4 groups
8. Procedure for selection	unknown
9. Reward	course requirement
10. Exclusion and reasons	unknown
11. Race / ethnicity	unknown
12. SES	unknown
13. Other information	none

Intercoder Reliability

One of the methodological issues in content analysis is that there is the possibility of experimenter bias when the person performing the coding knows the hypothesis or has a particular point of view (Bordens & Abbott, 1996). In order to avoid biased results, it is suggested that blind rater or more than one rater could be used to perform coding. Even though the information coded in this study is straight-forward and fairly structured, not requiring interpretation by the coder at the raw data level, another independent coder, a student who has completed two years of college, randomly coded 84 articles in the samples to determine accuracy of coding and to establish reliability. To determine intercoder reliability, a coefficient of reliability was calculated by counting the number of identical units, and dividing the number by the total number of units coded (Jackson,

1999). Complex and subtle categories would produce less agreement, but straight-forward categories such as gender and age should produce a high agreement. Jackson (1999) stated that a rule of thumb would be to have a minimum coefficient of .6, but a higher coefficient was expected in this study.

Analysis

Due to the use of non-experimental and descriptive methodology, the analysis of data was in the form of descriptive statistics. Quantification in content analysis most commonly involves measuring frequency, counting the number of times a given variable appears in the observational unit (Dane, 1990). Categories coded was summarized by using percentages. Figures were shown in tables and displayed on graphs. For illustration purpose and not reflecting any actual data being reported in this study, a sample table is shown below:

Table x

Percentage of Students as Subjects

Year	%
1916	35
1956	60
1996	85

The data in the above table could also be displayed in a graph:

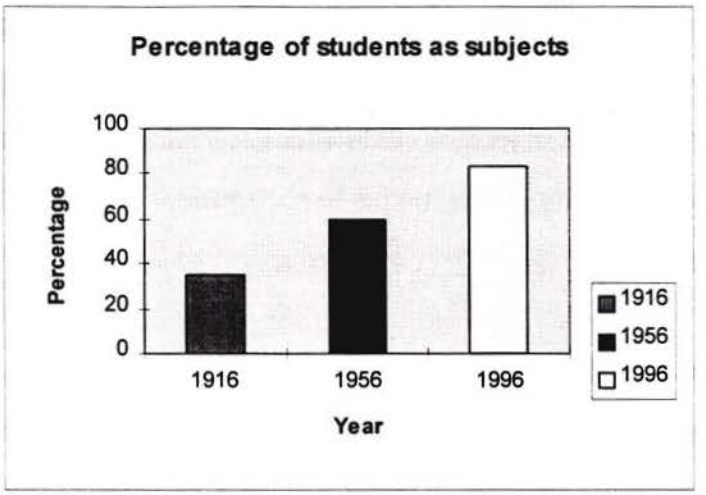

Figure x. Percentages of students as subjects in the Year 1916 (n = 37), 1956 (n = 73), and 1996 (n = 41) in the *Journal of Experimental Psychology*.

Summary of Chapter 3

Archival research is a descriptive, non-experimental research method that studies existing records to identify trends or relationships among variables. Content analysis is a systematic archival method in which researchers objectively follow each step of a set of carefully established procedures, using predetermined categories to collect data and draw conclusions.

This study on research participants used the content analysis technique to analyze the subject description in articles published in three highly rated psychological journals. A total of 392 articles published between the 1910s and the 1990s were sampled. Predetermined coding categories including number of subjects, gender, age/grade, who participated, general geographical location, type of institution, procedures for selection and assignment to conditions, rewards, exclusions and reasons, race/ethnicity, SES, and other information were analyzed.

CHAPTER 4 - RESULTS

This chapter will describe the results of the content analysis of the selected journal articles, analyze demographic information of experimental subjects, and examine changes regarding subject selection and reporting over the years in psychological research.

Reported Subject Information

One purpose of this study is to find out the extent to which relevant and important subject information is reported in research reports. Based on the suggested content of the subject subsection as outlined in the third edition (less direction found in the fourth edition) of the Publication Manual of the Amerian Psychologial Association (APA, 1983), a total of 384 articles were coded using 13 categories. In the overall analysis of reported information, two of these categories were omitted, reducing the total to 11 categories. The category "assignment to conditions" was omitted because it did not apply to a number of studies that used the observational, correlational, or interview/questionnaire research methods. The other category not included in the overall analysis was for "other information" since it was extra information, and not part of the APA guidelines.

For each article, every predetermined category was coded "yes" if the information was available or "no" if not available. A total score out of 11 (representing the 11 categories) was added up for each article, and an average percentage tabulated for each of the 14 volumes of journals sampled. For the three journals, *Journal of Experimental Psychology* (J.E.P.), *Journal of Educational Psychology* (J.Ed.P.), and *Child Development* (C.D.), and five time periods (1917, 1937, 1957, 1977, 1997) examined (1917 not available for C.D.), it was found that subject information was reported on an average of 52% of these categories, with a range of 33% to 74% as presented in Table 1 and Figure 1 below.

Table 1

Reported Subject Information (% yes)

	1917	1937	1957	1977	1997	overall
JEP	33	31	40	49	57	**42**
JEdP	48	45	48	54	69	**53**
CD	-	59	60	60	74	**63**
overall	**41**	**45**	**49**	**54**	**67**	**52**

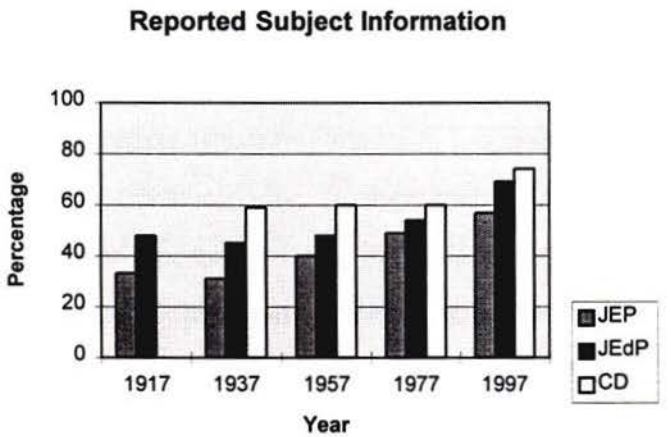

Figure 1. Percentage of reported subject information in JEP (n=140), JEdP (n=140), and CD (n=104).

Articles in each of the three journals had shown an increase in reporting subject information over the years. Of the three journals, C.D. articles had the highest report rate throughout, and by 1997 had increased to 74%, highest of all volumes examined. Both J.E.P. and J.Ed.P. articles had shown steady and gradual increases since 1917.

Analysis of Categories

Findings from the analysis of each one of the 13 coded categories will be discussed in detail.

Category #1 - number of subjects

Number of subjects was the most reported category with an overall average of 99%. Of the 384 articles examined, almost every article in the three journals, with the exception of five, reported the number of subjects in the samples consistently over a period of 80 years of psychological research.

Three different measures were used to analyze the actual reported number of subjects used including the range, the median, and the number of large samples which used over 100 subjects. It was found that there was a wide range of numbers of subjects used from the lowest of one to the highest of 3800 subjects.

In consideration of extreme numbers found in the range, the median was used as a measure of central tendency rather than the mean. Using the median is an advantage when there are scores of extreme size in the distribution that would distort a calculated average. For example, the mean number of subjects for C.D. in 1937 was 285.3 when the range of scores was between 16 and 2500. In fact, when means were calculated, 27% of the scores were above and 73% below the means on the average for the 14 volumes. Using the means under these conditions would distort or inflate the results. The median is a better measure here when 50% of the scores would be above and 50% below it.

In J.E.P. articles, the median number of subjects increased gradually from 12.5 in 1917 to 179.5 in 1997 as shown in Table 2 and Figure 2. The median appeared to be on the decrease for J.Ed.P. articles, and on the increase for C.D. articles with the 1997 median twice as high as previous years.

Table 2

Number of Subjects Used (median)

	1917	1937	1957	1977	1997
JEP	12.5	40	55	105	179.5
JEdP	136	271	117	138	98
CD	-	61	53.5	51	112.5

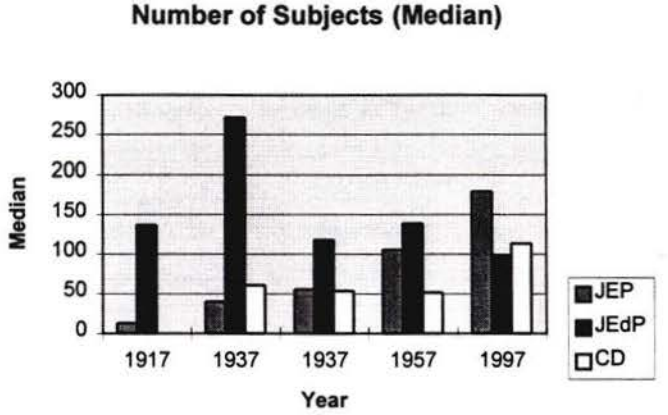

Figure 2. Number of subjects used (median) in JEP (n=137/140=98%), JEdP (n=138/140=99%), and CD (n=104/104=100%).

Data also indicated more research was using larger samples in recent years than in the past as indicated in Table 3 and Figure 3. This trend was shown in J.E.P when 75% of 1997 articles examined used more than 100 subjects compared to only 18% in 1917, and C.D. articles reported large samples in 61% of articles studied. The only exception was J.Ed.P. articles, which showed a decrease in the use of large samples in 1997 from earlier years.

Table 3

Samples with Over 100 Subjects (in %)

	1917	1937	1957	1977	1997
JEP	18	26	19	56	75
JEdP	61	74	54	67	50
CD	-	38	21	11	61

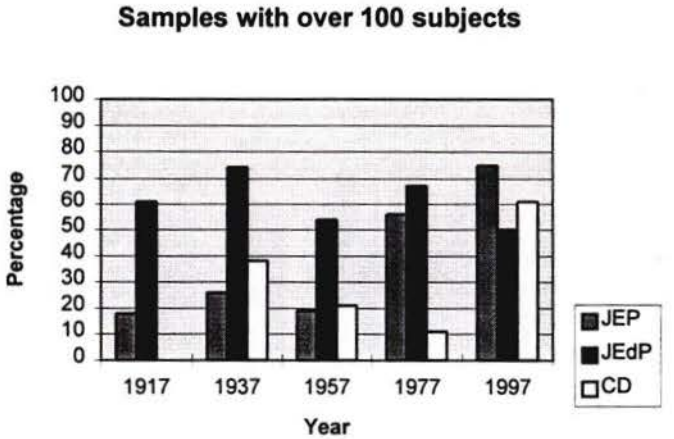

Figure 3. Samples with over 100 subjects in JEP (n=137/140=98%), JEdP (n=138/140=99%), and CD (n=104/104=100%).

Category #2 - gender

The overall data indicated that researchers did not place much importance in this category since only 55% of the articles reported subjects' gender. On closer inspection, J.E.P had the lowest percentage of articles (36%) reporting gender of subjects in 1997, whereas J.Ed.P. and C.D. articles had much higher reporting rates at 82% (1997) and 75% (1997) respectively as presented in Table 4 and Figure 4.

Table 4

Gender of Subjects Reported (%)

	1917	1937	1957	1977	1997	overall
JEP	39	43	68	43	36	**46**
JEdP	43	46	46	61	82	**56**
CD	-	54	71	64	75	**66**
overall	**41**	**48**	**62**	**56**	**64**	**55**

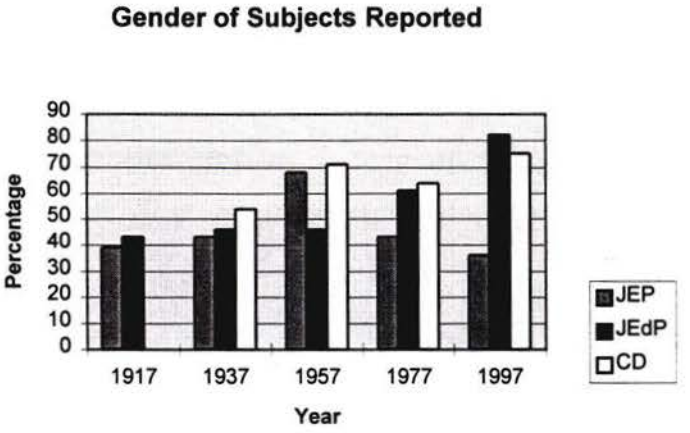

Figure 4. Gender of subjects reported in JEP (n=140,100%), JEdP (n=140,100%), and CD (n=104,100%).

One important question to be answered is whether there is over-representation of male subjects in psychological research. The analysis was done by first determining the percentage of male subjects in each experiment which ranged from 0% (no male subject) to 100% (all male subjects). For example, when a sample of 60 subjects consisted of 25 females and 35 males, the percentage of male subjects for that experiment was 58%. Data has shown that the mean percentage of male subjects exceeding the ideal 50% was found in 13 out of 14 volumes examined. High usage of male subjects appeared to be a characteristic of subject choice in the earlier years from 1917 to 1957 when 7 out of 8 volumes reported using over 60% of male subjects. J.E.P. articles had shown a steady decrease from a high of 77% male subjects in 1937 to 40% in 1997 whereas articles in J.Ed.P. fluctuated between 53% and 65%, and C.D. articles had a decrease of 20% between 1937 and 1997 as seen in Table 5 and Figure 5 below.

Table 5

Percentage of Male Subjects Used in Research (Mean)

	1917	1937	1957	1977	1997
JEP	62	77	76	51	40
JEdP	53	63	61	65	56
CD	-	73	60	51	53

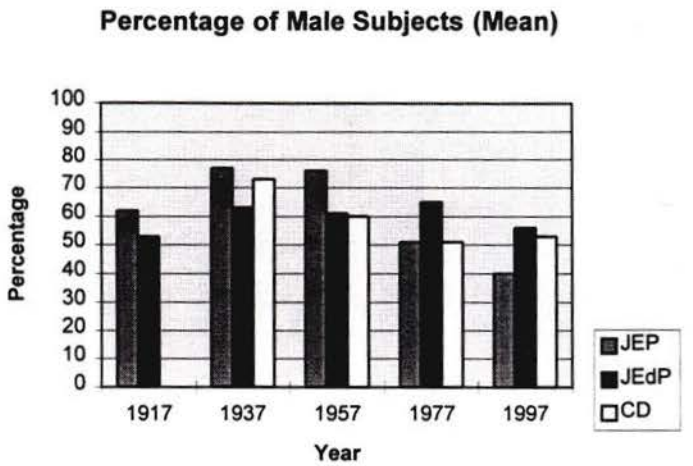

Figure 5. Percentage of male subjects used in JEP (n=64/140=46%), JEdP (n=78/140=56%), and CD (n=69/104=66%)).

It is assumed that when the male subject percentage is between 40% and 60%, researchers have the intention to have approximately equal male and female subjects in their experiment. More effort was made in recent years to equalize the male-female ratio as indicated by an increase in the percentages of experiments using between 40% to 60% male subjects in all three journals. Table 6 and Figure 6 showing experiments utilizing between 40% to 60% male subjects in 1997 reflected 81% in C.D., 70% in J.E.P., and 65% in J.Ed.P., much improved from earlier years.

Table 6

Research Using 40-60% Male Subjects (%)

	1917	1937	1957	1977	1997
JEP	18	33	11	67	70
JEdP	33	46	15	65	65
CD	-	54	76	72	81

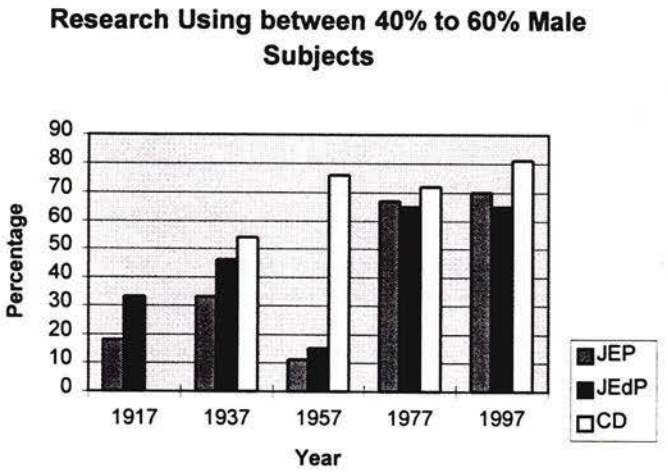

Figure 6. Research using between 40-60% male subjects in JEP (n=64/140=46%), JEdP (n=78/140=56%), and CD (n=69/104=66%).

On the contrary, fewer experiments analyzed in the articlesused only male subjects (100%). For example, 58% of experiments used only male subjects in 1957 in J.E.P. but none (0%) in 1997. All male subject samples occurred in only 4% of J.Ed.P. and 5% in C.D. articles in 1997 which showed that using male subjects exclusively had become rare in recent years.

Category #3 - Age

A lot of variation existed in the reporting of subjects' age among the three journals. In the J.E.P. articles analyzed from 1917-1997, an average of 21% reported the age of subjects. Of the J.Ed.P. articles analyzed, 58% reported age. C.D. articles reported age between 96-100% over the years. Overall, an increase in reporting subject ages is evident in articles of all three journals as summarized in Table 7 and Figure 7 below.

Table 7

Age of Subjects Reported (in %)

	1917	1937	1957	1977	1997	overall
JEP	16	20	18	14	39	**21**
JEdP	61	50	43	50	86	**58**
CD	-	96	96	100	100	**98**
overall	**39**	**55**	**52**	**55**	**75**	**56**

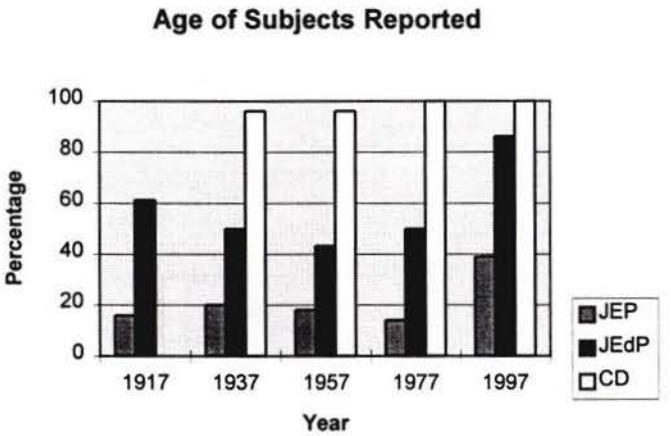

Figure 7. Age of subjects reported in JEP (n=140,100%), JEdP (n=140,100%), and CD (n=104,100%).

A further analysis was done to detect the age groups of the subjects participating in experiments. Subjects ages were coded into age groups of 5 years and under, 6-10 years, 11-15 years, 16 years and over, and multiple age groups. Data from J.E.P. articles indicated a consistency in the use of subjects 16 years and over from 1937 on with 80% to 100% of subjects coming from this age group. J.Ed.P. articles included approximately two thirds of subjects between the ages of 6 and 15 years. On the other hand, C.D. articles used subjects from a younger age group with about half of the subjects being five and under, and another 22% between 6 and 10 years old as shown in Table 8 and Figure 8 below.

Table 8

Age Groups of Subjects (Mean %)

	JEP	JEdP	CD
5 & under	13	6	50
6 - 10	2	42	22
11-15	2	25	7
16 & over	75	14	6
multiple age groups	8	13	16

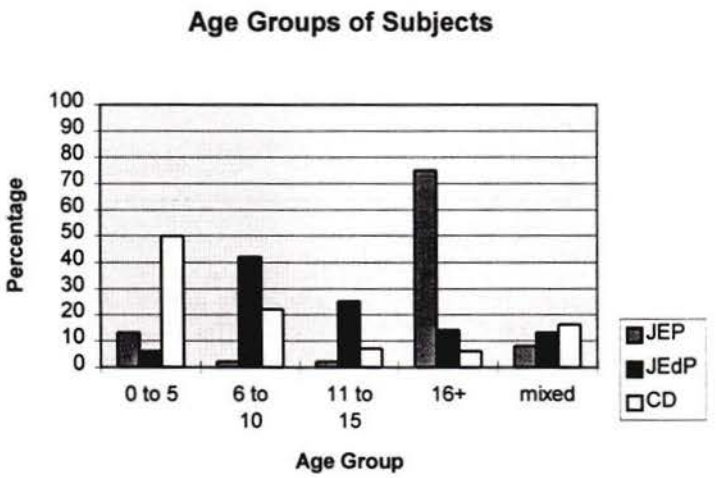

Figure 8. Age groups of subjects in JEP (n=31/140=22%), JEdP (n=81/140=56%), and CD (n=102/104=98%).

Category #4 - Who participated?

Of the 384 research articles analyzed, 360 (94%) indicated who the research participants were. J.Ed.P. and C.D. articles had maintained an identification rate of 90% and above average throughout, and J.E.P. increased its reporting gradually from 64% in 1917 to 100% in 1997.

Subjects were further coded into different categories in the three journals including infants, nursery and pre-school children, grade school students including both elementary and high school students, college and university students, special groups such as patients, the handicapped, military, siblings, delinquents, and others.

Table 9

Types of Subjects (%)

	JEP	JEdP	CD
infants	0	0	23
preschool & school children	6	43	43
college/university students	82	34	0
special groups	9	20	17
other	3	4	18

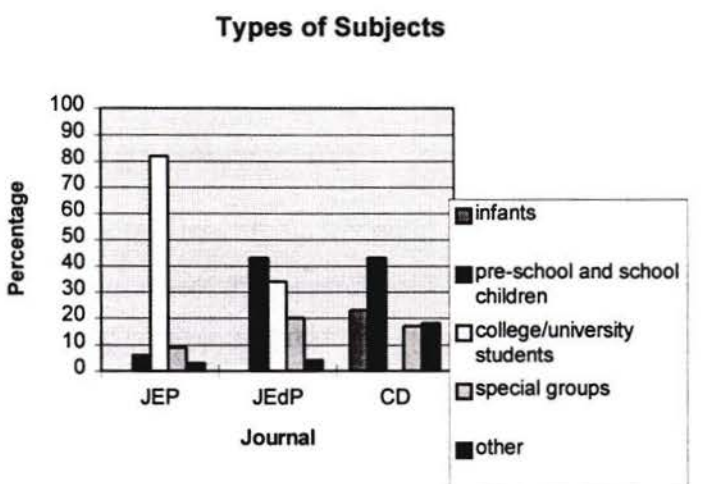

Figure 9. Types of subjects (Who?) in JEP (n=122/140=87%), JEdP (n=137/140=98%), and CD (n=101/104=72%).

Data displayed on Table 9 and Figure 9 indicated that college and university students were frequent subjects in J.E.P. with an overall mean of 82% and a range from 75% (1917) to 90% (1977). School aged children were frequently used in J.Ed.P. research articles with a mean of 43%. College and university students were also often used at 34% on the average in J.Ed.P., and a drop from a high of 50% in 1957 to 14% in 1997.

A slightly different set of categories was used in C.D. articles since younger subjects such as infants and nursery school children provide the focus of this journal. There was a shift in the choice of subjects from preschool / grade school students in the earlier years (1937 and 1957) to infants in later years (1977 and 1997). There was also an increase in subjects who were from the public, previous research projects, and longitudinal studies in 1997 (29%) compared to previous years, and a decrease of nursery and grade school students as seen in Table 10.

Table 10

Types of Subjects in C.D. (%)

	1937	1957	1977	1997
infants	9	0	50	32
nursery and preschool children	18	39	4	7
grade school students	32	35	18	18
special groups	27	13	14	14
other	15	13	14	29

Category #5 - General Geographic Location

The location where the research took place was reported in 58% of the articles coded, with a range of 25% to 83%. J.E.P. articles had increased in reporting geographic location over the years from 25% in 1937 to 75% in 1997. However, a decrease occurred in both J.Ed.P. and C.D. articles from 71% and 83% in the earlier years to 57% in 1997 as shown in Table 11 and Figure 10.

Table 11

Geographic Location Reported (%)

	1917	1937	1957	1977	1997	overall
JEP	54	25	29	59	75	**48**
JEdP	71	68	68	50	57	**63**
CD	-	83	67	50	57	**64**
overall	**63**	**59**	**55**	**53**	**63**	**58**

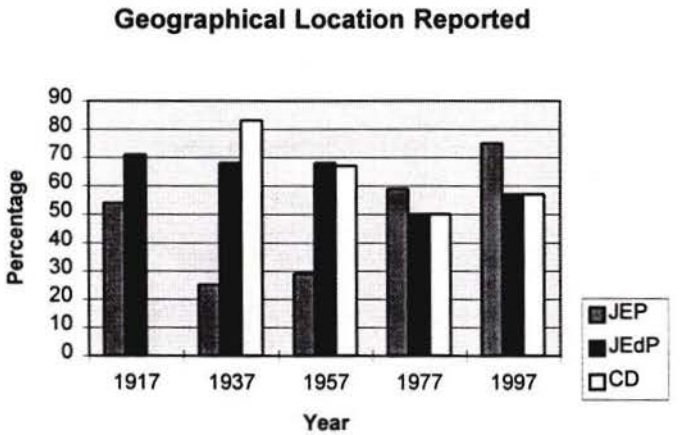

Figure 10. Geographical location reported in JEP (n=140,100%), JEdP (n=140,100%), and CD (n=104,100%).

An analysis was done to determine how specific the location of the research was reported in each article. Three categories from the most to the least specific locations were used which included named institution, named city, and named area or country. J.E.P. articles had the most specific report, giving names of institutions where the subjects came from in 89% of the 68 articles that mentioned location. J.Ed.P. articles were more specific in the earlier years reporting named institution 80% in 1917, 58% in 1937, and 63% in 1957, and decreased to 29% in 1977 and 13% in 1997, giving names of only the general area or country. The articles in C.D. showed a similar pattern, becoming less specific in the later years, reporting named institution only 6% in 1997, a huge drop from 70% in 1937 as displayed in Table 12 and Figure 11. Both J.Ed.P. and C.D. articles

reported named city and /or named area and country instead in 1977 and 1997, a change from previous years.

Table 12

Named Institution Reported (%)

	1917	1937	1957	1977	1997
JEP	90	100	75	88	90
JEdP	80	58	63	29	13
CD	-	70	63	29	6

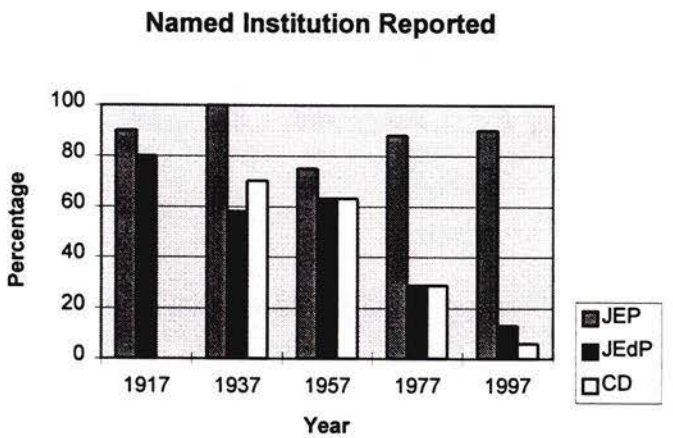

Figure 11. Named institution reported in JEP (n=68/140=49%), JEdP (n=88/140=63%), and CD (n=66/104=63%).

Category #6 - Subjects' Institutional Affiliation

This category was reported with an overall average of 85%. J.E.P. showed a gradual increase to 95% in 1997 from 50% in 1937. J.Ed.P. articles had an average of 94% from 1917 to 1997. C.D. articles showed a range from 71% to 96%, and an average of 84% as summarized in Table 13 and Figure 12.

Table 13

Subjects' Institutional Affiliation Reported (%)

	1917	1937	1957	1977	1997	overall
JEP	61	50	89	89	95	**77**
JEdP	96	93	86	93	100	**94**
CD	-	88	96	71	82	**84**
overall	**79**	**77**	**90**	**84**	**92**	**85**

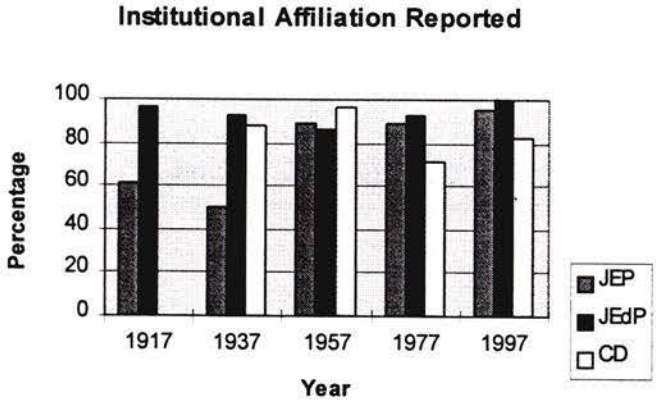

Figure 12. Subjects' institutional affiliation reported in JEP (n=140,100%), JEdP (n=140,100%), and CD (n=104,100%).

The types of institution coded in the literature were grade school, college/university, special institution such as child welfare research units and orphans home, nursery and preschool, and others including the public as presented in Table 14 and Figure 13.

Table 14

Types of Institution Reported in JEP and JEdP (%)

	JEP	JEdP
school	4	47
college/university	86	35
special institution	8	14
other	2	4

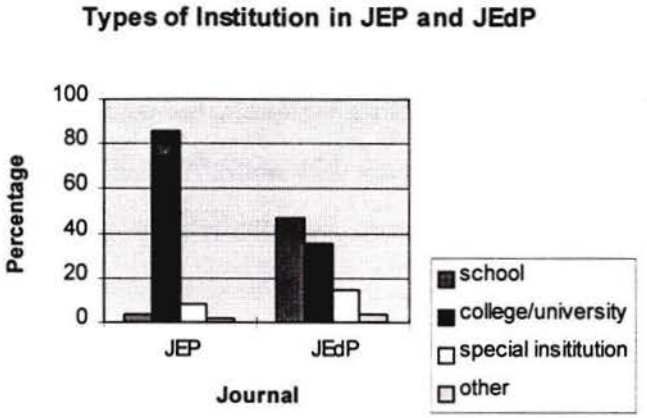

Figure 13. Types of institution reported in JEP (n=108/140=77%), and JEdP (n=131/140=94%).

Data indicated that on the average, 86% of the subjects in J.E.P. articles consistently came from college/university through the years 1917, 1937, 1957, 1977, and 1997 with a range of 74% to 100%. For J.Ed.P. articles, grade school was the most common institution overall followed by college/university. However, in 1997 school affiliated subjects has increased significantly to 77% while college/university affiliation had dropped to 13%.

For C.D., slightly different institution categories were used due to the younger subject groups involved in developmental research as presented in Table 15 below.

Table 15

Types of Institution Reported in CD (n=87)

	1937	1957	1977	1997
hospital & clinic	10	0	25	26
lab/nursery & preschool	19	52	5	9
school/college/university	29	30	50	26
special institution	33	11	15	13
other	10	7	5	26

Subjects from C.D. articles came from a variety of institutions in different time periods. In 1937, one third (33%) of subjects were from special institutions, and 29% were school and college/university affiliated. Slightly over half (52%) were from

lab/nursery and preschool in 1957 and 30% were affiliated with school and college/university. The 1977 data showed another shift with 50% school affiliated subjects and 25% hospital and clinic affiliated. Most recently in 1997, there was a wider spread of institutional affiliation with subjects coming from hospital and clinics (26%), schools (26%), and other which was often the public (26%).

Category #7 - Assignment of Condition

This category had been omitted from the analysis because it was not possible to have it coded properly due to certain difficulties. First, it was found that assignment of condition was often not part of the subsection of participant information, but found in different parts of the research report, and it was difficult to locate the information without reading the whole report. Second, most of the reports that mentioned groups in the experiment did not described how subjects were assigned into those groups. Third, only approximately half of the research analyzed utilized two or more groups and conditions, and the other half involved the used of other methods such as correlational, observational, and repeated measures. Some studies were longitudinal in nature, many were questionnaires, surveys, self reports, and others involved standardization of tests and scales particularly common in earlier years.

Category #8 - Procedure for Selection

The overall reporting rate of procedure for selection among the three journals in the 14 volumes analyzed were 36% with the range being 7% to 75%. Table 16 and Figure 14 indicated some variation between the journal articles with means of 14% (J.E.P.), 39% (J.Ed.P.), and 60% (C.D.) with increases found in all three journals over the years. When combined, the mean of 18% in 1917 was increased to 56% in 1997.

Table 16

Selection Procedures Reported (%)

	1917	1937	1957	1977	1997	overall
JEP	7	7	11	14	32	**14**
JEdP	29	14	43	46	61	**39**
CD	-	50	67	46	75	**60**
overall	**18**	**24**	**40**	**35**	**56**	**36**

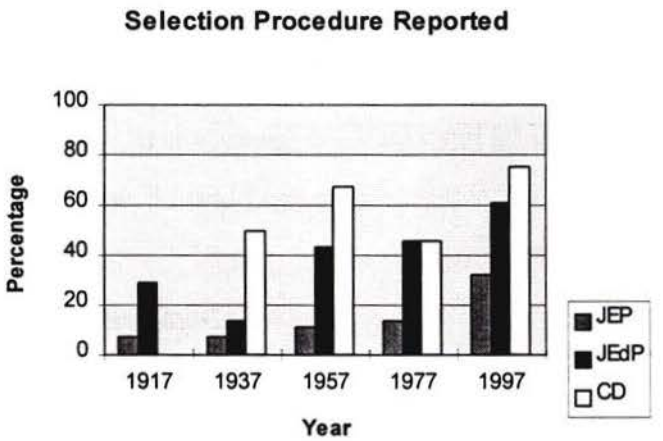

Figure 14. Selection procedure reported in JEP (n=140,100%), JEdP (n=140,100%), and CD (n=104,100%).

Methods of subject selection reported in J.E.P. and J.Ed.P. included volunteers recruited from psychology and other courses, recruitment from hallways on campus, newspaper advertisements and flyers, and from subject pool which has become more common over the years.

Articles published in C.D. has a higher report rate in selection procedure than J.E.P. and J.Ed.P., ranging from 46% to 75%. The most common method of selection for C.D. articles in 1977 and 1997 was through birth announcements, birth record files, advertisement, and subject pool which accounted for 44% of the 34 articles that reported selection procedure. Another common choice of subject selection in these periods of time were from special institutions and groups, using their patients and residents. In the earlier years of 1937 and 1957, selection of subjects were often from entire or available classes

at nursery schools, preschools, and grade schools which made up of 50% of the 28 articles reporting subject selection information. Other sources for selection included special institutions and choosing subjects from other larger projects and longitudinal studies.

Category #9 - Reward

The reporting of reward given to the subjects for their participation in experiments were low with only an overall average of 17% and a range from 0% to 82%. Out of 14 volumes analyzed, only the 1977 and 1997 volumes of J.E.P. reported this information in 82% of the 56 articles coded and all the others were low or non existent as summarized in Table 17 and Figure 15.

Table 17

Reward Reported (%)

	1917	1937	1957	1977	1997	overall
JEP	4	11	21	82	82	**40**
JEdP	0	0	0	21	7	**6**
CD	-	0	0	11	11	**6**
overall	**2**	**4**	**7**	**38**	**33**	**17**

Figure 15. Reward reported in JEP (n=140,100%), JEdP (n=140,100%), and CD (n=104,100%).

A further analysis was done on the types of reward offered to subjects participating in research in 1977 and 1997 in J.E.P. articles, the two volumes with the highest percentage. There were three main methods of reward: payment, course credit, and course requirement in which students' participation in experiments were required in the course. It was found that the most common reward in both years was payment to subjects with 43% in 1997 and 41% in 1977 as presented in Table 18 and Figure 16. Course credit and course requirement were also reported as usual reward for participation in research.

Table 18

Reward Used in JEP in 1977 and 1997 (%)

	1977	1997
payment	43	41
course credit	35	26
course requirement	22	33

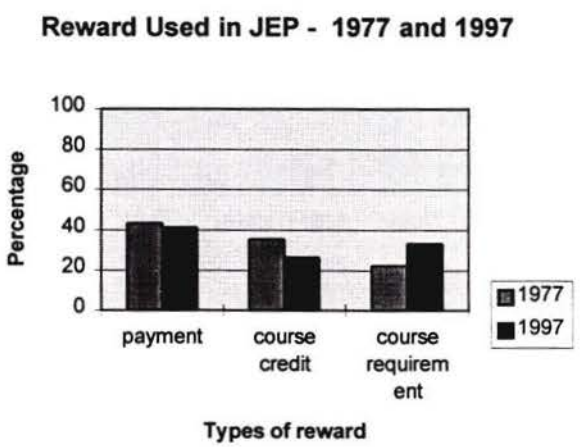

Figure 16. Reward used in JEP (n=46/56=82%) in 1977 and 1997.

Additional reward reported in other volumes in J.Ed.P. and C.D. included small gifts such as toys and candy for children, pins, pens, and in one case doing the experiment in lieu of a regular exam in one J.E.P. article.

Category #10 - Exclusions and Reasons

The category of exclusions and reasons for not continuing with the experiment has an overall low reporting rate of 22% with a range of 0% to 64% as shown in Table 19 and Figure 17.

Table 19

Exclusions and Reasons Reported (%)

	1917	1937	1957	1977	1997	overall
JEP	11	11	18	39	46	**25**
JEdP	0	0	0	21	7	**6**
CD	-	13	21	54	64	**38**
overall	**6**	**8**	**13**	**38**	**39**	**22**

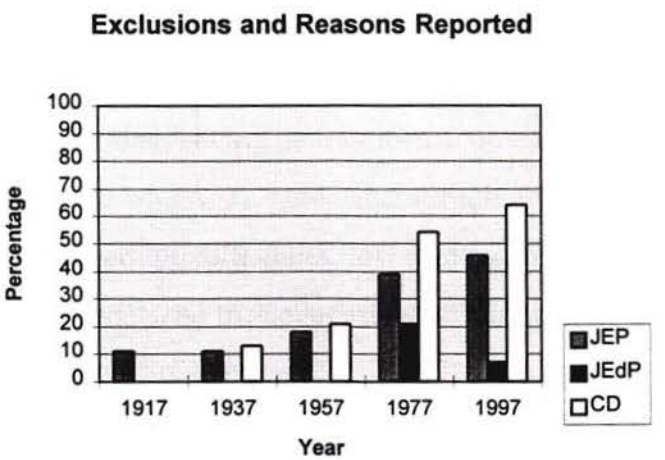

Figure 17. Exclusions and reasons reported in JEP (n=140,100%), JEdP (n=140,100%), and CD (n=104,100%).

J.E.P. articles showed a gradual increase from 11% in 1917 to 46% in 1997. J.Ed.P. articles had remained low throughout with the highest being 21% in 1977. C.D. articles had shown an increase in reporting from 13% in 1937 to 64% in 1997 which was the highest among all 14 volumes.

There were various reasons reported for exclusions of subjects from experiments. One common reason cited by J.E.P. articles was the subject's failure to meet the criteria. Other reasons often given were failure to recall, incomplete answers, high error rates,

failure to attend all sessions, and unable to follow instructions. Mechanical difficulty as well as computer failure were also cited as reasons for exclusions.

The most common reasons for exclusion mentioned in J.Ed.P. articles were difficulties in reading, language, speech, and hearing as well as school dropout, incomplete tests, and moving away. Some were excluded due to age limits, grade level, and not having English as a primary language. Other subjects were not included in the early years because they were blacks, mentally deficient, having physical abnormalities, and being low achievers.

There were two areas of reasons for exclusions often cited in reports in C.D. One was non-participation when families refuse to cooperate, did not complete tasks, refuse to participate in later tests (time 2), absence from school and moved away. Another common reason of exclusion was related to problems arising from the infants and children such as crying, fussing, falling asleep, illness and disease, medication used interfering with testing, having developmental problems, and infant mortality. Children were also excluded when they were inattentive, highly impulsive, and not compliant. Others who had learning difficulties, low reading ability and low IQ, physical anomalies, as well as the colored, and the epileptics were all excluded.

Categories #11 - Race / Ethnicity

The overall average of reporting race/ethnicity among the three journals were 19% and having a range of 0% to 75% as displayed in Table 20 and Figure 18.

Table 20

Race / Ethnicity Reported (%)

	1917	1937	1957	1977	1997	overall
JEP	4	7	0	7	14	**6**
JEdP	7	4	7	21	57	**19**
CD	-	25	8	32	75	**35**
overall	**6**	**12**	**5**	**20**	**49**	**19**

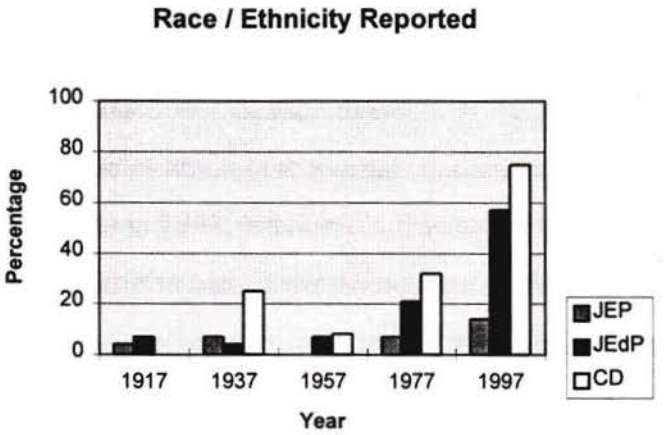

Figure 18. Race/ethnicity reported in JEP (n=140,100%), JEdP (n=140,100%), and CD (n=104,100%).

There were variations found among the three journals with J.E.P. articles reported race/ethnicity in only 6% of the 140 articles coded. J.Ed.P. articles with a 19% average report rate, has shown an increase from 4% in 1937 to 57% in 1997, and C.D. has also increased from 8% in 1957 to 75% in 1997.

In the nine articles (out of 140) that reported this information in J.E.P., two gave a percentage breakdown of Caucasians, Blacks, Hispanics, and Asians, three identified their subjects as native English speakers, and the others described subjects as colored, part Black, Polish, Russian, and Hebrew speaking.

In 1997, J.Ed.P. articles had increased its reporting of race and ethnicity to 57%. Data indicated that 65% of subjects described in the 16 articles were white, English speaking, and often referred to as European Americans. Others has only described the subjects vaguely as ethnically mixed, or predominantly white, or consisting a wide range of cultural groups.

Also in 1997, C.D. articles had shown the highest rate of reporting race/ethnicity in 75% of articles coded. It was found that 88% of subjects were white, English speaking American children of European ancestry. Data also indicated that 9 out of 21 articles (43%) that reported race used white subjects exclusively.

Category #12 - SES

Showing very similar pattern as the race/ethnicity category, SES was reported in 22% of the 384 articles with a range of 0% to 71%. Table 21 and Figure 19 below shows the variation in articles among the journals in their reporting practices. With the exception of two articles (7%) in 1997, articles in J.E.P. did not report any SES information of subjects. J.Ed.P. articles had shown an increase from a low of 4% in 1917 to 61% in 1997. Research in C.D. reported SES most frequently with 71% in 1997.

Table 21

SES Reported (%)

	1917	1937	1957	1977	1997	overall
JEP	0	0	0	0	7	**1**
JEdP	4	11	7	25	61	**22**
CD	-	33	46	36	71	**47**
overall	**2**	**15**	**18**	**20**	**46**	**22**

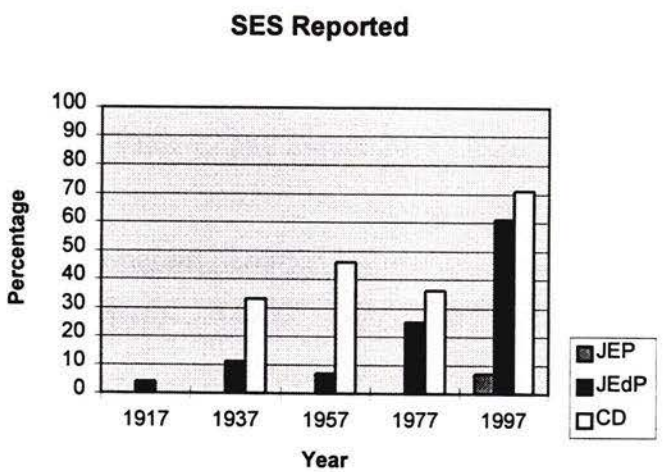

Figure 19. SES reported in JEP (n=140,100%), JEdP (n=140,100%), and CD (n=104,100%)

A closer look at the reported SES of subjects revealed that the majority came from the middle class. For example, 95% of those reported in CD articles in 1997 were from the middle class. However, middle class has not been clearly defined and appeared to include those from the working class to professionals. Only 7 out of 81 articles (9%) that reported SES used scales and indexes to determine SES, and two other articles mentioned the percentage of free and reduced lunch as a measure of SES. Some articles just vaguely mentioned that subjects were from a range of SES, and that efforts were made to recruit participants with a wide range of spectrum of social class.

Category #13 - Other Information

This category refers to any reported information about the subjects other than the ones discussed previously, and extra to those suggested for inclusion by the Publication Manual of APA (APA, 1983). The overall report rate indicated that 42% of 384 articles gave extra information about the subjects. J.E.P. articles showed a decline in reporting such information over the years from 64% in 1917 to 25% in 1997. J.Ed.P. and C.D. articles increased their reporting of other information to 57% (J.E.P.) and 74% (C.D.) in 1997 as shown on Table 22 and Figure 20.

Table 22

Other Information Reported (%)

	1917	1937	1957	1977	1997	overall
JEP	64	43	14	29	25	**35**
JEdP	18	25	36	29	57	**33**
CD	-	50	58	71	75	**64**
overall	**41**	**39**	**36**	**43**	**52**	**42**

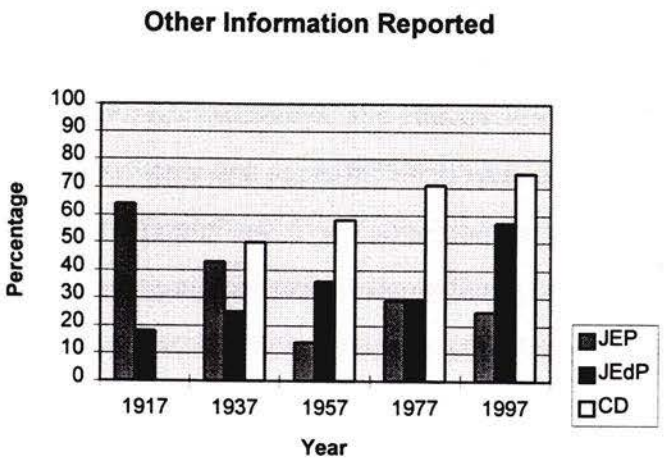

Figure 20. Other information reported in JEP (n=140,100%), JEdP (n=140,100%), and CD (n=104,100%).

There was a wide variety of other subject information reported including personal, physiological, and family information, test scores, and others. Data indicated that each of the three journals differed in their choice of information to be included in reports, likely related to the population studied or the field of research.

One special item found only in J.E.P. articles was the identification of subjects in articles published in the early years. In 1917, three articles gave the names of subjects who participated. Initials of subjects were also frequently used throughout research reports, and details of individual results were displayed in tables and described in the text. There was a decline in this practice in the 1957 and 1977 reports, and in 1997 it has disappeared totally. Physiological characteristics reported included visual acuity which was frequently given, hearing, height and weight, and alpha waves. Other information given were education levels and history, political affiliation, test scores, handedness, lip reading ability and use of ASL, the subjects' general temperament and emotional state, and others.

J.Ed.P. articles chose to report different information about subjects than those found in J.E.P. Information concerning IQ and test scores were reported frequently over

the years. Other items also mentioned were grade point average, education level, class size, family size, and others.

As in J.Ed.P., IQ, test scores, and education levels were frequently reported in C.D. articles. Other items that appeared often were description of the subjects' (usually children and infants) family and living condition, type of community lived in, percentages of intact family as well as single family home, family size, number of siblings, and birth order. Physiological characteristics of subjects such as birth weight and gestational age were also regarded as important information in developmental research. Also included were information about mothers and delivery method, length of hospital stay, medication, handedness, feeding and nap habits, parents' age, years married, and others.

Intercoder Reliability

In order to establish coding reliability, an independent coder coded articles in one volume of each journal. This included volume 53 (1957) of J.E.P., volume 89 (1997) of J.Ed.P., and volume 48(1977) of C.D. To determine intercoder reliability, a coefficient of reliability was calculated by counting the number of identical units and dividing the number by the total number of units coded. A total of 924 units from 84 articles with 11 units each were coded (84x11). There were 815 identical units, when divided by the total number of units coded resulted in a coefficient of .88, which is higher than the minimum coefficient of .6 suggested by Jackson (1999). The .12 coefficient discrepancy occurred when information was not included in the appropriate subject sections. Discrepancies in coding interpretation between the writer and the independent coder also occurred in the category of selection procedure.

Summary of Chapter 4

This chapter described and analyzed the data collected from coding 384 articles using predetermined categories. Overall results found that the 11 categories has a 52% report rate among the three journals. Gradual increases were noted in the reporting of subject information over the years.

Analysis of individual categories revealed a variety of report rates over the years from the three journals. The most frequently reported categories was number of subjects (99%), followed by who the subjects were (94%), and institution type (85%). The categories reported by approximately half of the articles were gender (55%), age (56%) and geographic location (58%). Other categories were reported less frequently and with great variations among the journals. Overall increase in reporting were found between 1917 and 1997 in most cases.

Further analysis were done on the categories and more information was discovered about sample size, sex, age, who the subjects were, where and what type of institution they were from, how they were selected, type of reward subjects received, reasons for excluding some subjects, their race/ethnicity and SES, and other information.

The following chapter will discuss the findings and conclusions of this study. Implications of the findings and some recommendations for future research will also be discussed.

CHAPTER 5 - DISCUSSION

This chapter discusses the findings of the study presented in the previous chapter. It attempts to review some of the issues and questions raised regarding subject selection and reporting based on the data collected. Implications of the findings and recommendations for future research are discussed as well.

Subject Reporting and Selection

Reporting of Subject Information

The findings of this content analysis indicates that the reporting of important and relevant subject information has been inadequate in research reports found in the three journals sampled. Subject information was reported on an average of 52% of the APA suggested items. A number of researchers (e.g. White & Duker, 1973; Brookshire, 1983; Wickstrom, 1985; and others) had noted the lack of information over the years in various fields of psychology. Data had shown, however, that a steady and gradual increase over the span of 80 years, from 41% reported in 1917 to 67% reported in 1997.

Overall results of the analysis revealed that, in research reported in the three journals, the number of subject was the most reported category (99%), followed by a description of the participants (94%), and their institutional affiliation (85%). Categories less frequently reported were geographic location (58%), age (56%), and gender (55%). Even less attention was given by psychological writers to the other categories of selection procedure (36%), exclusions and reasons (22%), SES (22%), race (19%), and rewards offered (17%). It was surprising that some of the basic information such as age and gender were mentioned only in about half of the articles, and SES and race were found in less than a quarter of the 384 articles. However, caution should be taken when reviewing these results since variations in the categories often existed among the articles in the three journals, and these overall percentages did not necessarily reflect the percentages of individual journals. For example, C.D. has a higher rate of reporting subject information than J.E.P. and J.Ed.P.

Further analysis of categories provided more details about the subjects. A limitation existed, however, because the report rates of some categories were low, and information was unavailable, making it difficult to draw meaningful conclusions. It was noted that unavailable information could be due to under-reporting as well as issues surrounding research design.

Number of Subjects

The number of subjects was the most reported category. The median number of subjects used in recent years was much higher than the earlier years with the exception of J.Ed.P. By 1997, 75% of the samples in J.E.P. used over 100 subjects when only 18% used samples this large in 1917. This change reflected a shift in focus in basic psychological experimentation from studying the individual subjects' introspective reactions to psychological stimuli to studying aggregates and groups of subjects using average values from group data as noted by Danziger (1990). J.Ed.P. and C.D. showed no specific pattern of change even though both were using large samples of over 100 subjects in more than 50% of their research in 1997.

Gender

Smart (1966), Schultz (1969), Crawford & Marecek (1989) and others noted an over-representation of male subjects in psychological research. Their findings were supported by data from the earlier years of 1917, 1937, and 1957 when 7 out of 8 volumes reported using over 60% males as samples. The highest male samples was 77% (1937) and 76% (1957) in J.E.P. and 73% (1937) in C.D. articles. The highest percentage was found in 1957 in J.E.P. articles when over half (58%) of research used male subjects exclusively. However, a change was evident in 1977 and 1997 when the male-female ratio was more balanced with most research using between 40-60% male subjects, and exclusive use of male samples was rare. One possible explanation of the increase in female subjects in J.E.P. and J.Ed.P. articles was that there was an overall increase of female university students in recent years. Current statistics revealed that college and university enrollment of females was approximately 56%, which was 12% higher than

males in both Canada and the United States (Statistics Canada, 1999; U.S. Bureau of the Census, 1998). In recent years another possible explanation is perhaps related to more awareness in using neutral language as influenced by guidelines in the fourth edition of the Publication Manual (APA, 1994).

Age

The three journals varied greatly in their report of the age of subjects. Data indicated that C.D. articles regarded age as a very important variable in developmental research, and reported it in 96% of the articles in 1937 and 1957, and 100% in 1977 and 1997. On the contrary, J.E.P. articles ignored this category throughout with an overall reporting rate of only 21%.

When the actual age groups were tabulated, there were definite favorite age groups from which the researchers selected their subjects. With its focus on development, researchers in C.D. articles mainly used the youngest subjects of 5 years and under (50%) as well as children under the age of 10 (22%). J.Ed.P. articles reported the use of slightly older children, mostly in the 6-10 years group (42%), and also the 11-15 years group (25%). Young adults were favored by J.E.P. researchers (75%), a different group than those selected for the other two journals.

Who Participated?

Types of subjects participating in research has been reported frequently. This is different from the age variable even though the two were somewhat related. As in age groups, research in the three journals has used predominantly different types of subject in experiments. For J.E.P., college students were used 82% of the time, reflecting sampling bias. College student samples are usually samples of convenience where large numbers are available on college campuses. According to Smart (1966), they were willing subjects trying to please instructors and to complete course requirement. As noted previously by Smart (1966), Schultz (1969), Higbee and Wells (1972), Sears (1986), and others, college students might not be representative of the total adult population. Statistics indicated that college and university enrollment in 1995-1996 was only 2.8%

and 7.8% of the total population in Canada and the United States respectively (Statistic Canada, 1999; U.S. Bureau of the Census, 1998).

In this study J.Ed.P. favored using school children the most followed by college and university students. C.D. shifted form using grade school / preschool subjects in 1937 and 1957 to infants in 1977 and 1997. There was also an increase in obtaining subjects from longitudinal studies. In general, most subjects appeared to be affiliated particularly with the colleges, universities, and schools, but rarely from the general public in the community.

Geographic Location

Geographic location has been reported in 58% of the articles with J.E.P. showing increases and J.Ed.P. and C.D. having a drop in percentages over the years. J.E.P.articles had been very specific about where the research took place, giving names of institutions, usually universities. On the other hand, J.Ed.P. and C.D. articles had been less and less specific over the years, leaving out names of institutions, and only named the cities, areas, or countries instead. This decrease of information regarding geographic location in some journals could perhaps be due partly to the need for anonymity in research. Also, in recent years, an increase in the use of infants from the community and subjects from longitudinal projects would account for the lack of specificity in naming institutions in C.D. articles.

Institutional Affiliation

This is a well reported category with an overall average of 85%. J.E.P. and J.Ed.P. articles had used subjects from similar types of institution, mainly from colleges, universities, and schools. J.E.P. articles often gave names of universities and locations, but such specific information were on the decline in J.Ed.P. and C.D. articles over the years. Due to the use of younger subjects, different institutional categories were used in coding C.D. articles. Data indicated that subjects in C.D. were associated with more types of institutions especially those associated with infants and young children such as hospitals and clinics, nurseries and preschools. Lab schools affiliated with universities

were often involved as a source of subjects in the earlier years of 1937 and 1957. However, changes occurred in 1977 and 1997 and there was an increase of subjects from hospitals, clinics, and other sources, and as a result involved more participation from the public community.

Procedure for Selection

Great variation existed among the three journals in their report of subject selection procedure with an overall rate of 36%. J.E.P's report rate was very low throughout from 7% in 1917 to 32% in 1997 with a gradual increase during the in-between years. J.Ed.P. and C.D. articles had done better, and by 1997 reached 61% and 75% respectively.

In J.E.P. and J.Ed.P., a common subject selection method reported was by recruiting volunteers form undergraduate courses and from introductory psychology courses in particular. University procedures creating subject pools, often introductory psychology students, have become more common in recent years. C.D. researchers often selected entire classes at nursery schools and preschools in the earlier years, and relied more on birth announcements, birth record files, advertisement, and subject pools in recent years. Previous research projects and longitudinal studies were also common data sources on which some reports were based.

In general, many studies listed criteria for inclusion, but seldom explained why and how particular groups or schools were selected. Some mentioned that the samples were believed to be "representative" but failed to further explain why such a claim was made. White and Duker (1973) stated that readers were entitled to know how the selection of sample was done, why a particular class was chosen, who were left out, and how the individual selection was done.

Reward

Reporting reward given to subjects for their participation in research was rare. It is difficult to discern whether reward was not reported or if no reward was given at all. Most of the articles analyzed ignored this item except for the 1977 and 1997 volumes of J.E.P. which reported it in 82% of the cases. The most common method of reward

reported was monetary. Other methods included course credit and course requirement. Previous research by Tomporowski et al. (1993) indicated performance of students recruited by the monetary incentive method was significantly higher on tests of attention and memory when compared to the course credit incentive method and the course requirement method. It is apparent that reporting the method of reward is important, yet it has not been included in many research articles examined in this study.

Exclusions and Reasons

Similar to the reward category, it is difficult to decide if a lack of information regarding exclusions and reasons was due to poor reporting or if there were few exclusions of subjects in research. Though the overall reporting rate was poor (22%), J.E.P. and C.D. articles showed gradual increases to 46% and 64% respectively in 1997 while J.Ed.P. articles appeared to be neglecting this item throughout. Main reasons cited for exclusions were often related to subjects not completing tasks or meeting criteria. Other reasons given in early years such as physical anomalies, black, and colored would have been considered politically incorrect by current standards. The importance of including exclusions and reasons has been noted by Betan et al. (1995) that participant attrition during the research process is an important issue affecting generalizability and validity of the reported research.

Race and Ethnicity

Race and ethnicity has not been a well reported category through the history of psychology. However, by 1997, each of the three journals has shown some increases compared to previous years. C.D. articles had shown the highest increase by 1997, reporting race and ethnicity in 75% of the 21 articles coded. Race and ethnic origin of subjects should always be included and be considered an important variable because subjects from different ethnic background often have different experiences with social organization, economic opportunities, and life experience in general (Hernandez, 1997).

Research in the past (Graham, 1992; Miranda, 1996) had pointed out the under-representation of minorities in psychological research and the need to study ethnically

diverse populations. Due to the low rate of reporting race and ethnicity in most of the volumes coded in this study, it is difficult to identify the ethnic origin of the subjects. For those articles that reported this information, subjects were found to be predominantly white, English speaking Americans and American children of European ancestry. It was surprising to find that in 1997, 43% of the 21 articles in C.D. reported using white subjects exclusively in their research despite of previous criticisms of inadequate minority samples and suggestions of the importance of studying more culturally diverse populations.

SES

Similar to race and ethnicity, SES was reported at a low rate with a lot of variations between the journals. J.E.P. articles ignored this item throughout, reported SES in only 2 out of 140 articles. J.Ed.P. and C.D. articles took a step in the right direction by improving their reporting rate to 61% and 71% by 1997. As in the race and ethnicity variable, SES should always be included because family income levels can result in vastly different home environment and different educational opportunities (Hernandez, 1997). It has been argued that SES is one of a number a critical variables for matching subject groups but has often been neglected (Schmitt & Meline, 1990).

As for the actual SES of subjects, most were reported to have come from the middle class. The term middle class has often been used vaguely without reference to how it is measured. Since only 7 out of 81 articles (9%) reporting SES used scales and indexes to determine SES, it appeared that most researchers did not have access to adequate measures of SES of their subjects and may have labeled them middle class for convenience.

Other information

In addition to the categories suggested by APA for inclusion as discussed above, extra information was reported in 42% of the 384 articles. There was a decrease in J.E.P. articles but increases in J.Ed.P. and C.D. articles in reporting such information over the years. There was a wide variety of extra information, and it often reflected the different

research focus and interests of individual journals. For example, in the early years of psychological experimentation when individual results from self-observations were studied in detail, subject's names and initials were often given and used throughout the articles. This practice disappeared gradually over the years as the focus was shifted to the use of group averages and results without individual subject identification. IQ test scores, GPA and educational level were frequently reported in J.Ed.P. articles whereas C.D. articles often reported subject's family background, parental information and living condition, and information relating to birth and physiological characteristics.

Much of this extra information stated important variables relevant to the interpretation of research results and such information should be included more consistently. It is especially important for developmental research to have thorough descriptions of demographic factors in the samples as suggested by a number of researchers (e.g. Hernandez, 1997; Phares & Lum, 1996).

Limitations

One difficulty encountered in this content analysis was that findings were based only on reported information, which has shown to be inadequate in the journals. The low reporting rate of some categories made it impossible for conclusions to be made with high level of confidence. Another problem was that subject information was sometimes not reported in the subject section but in other sections of the articles. Coders had tried to locate subject information in other sections, yet some information might have been missed. In addition, findings and conclusions were limited to articles in the three journals examined, and additional analysis would be needed to generalize the results to other journals in other fields of psychology. The study did not examine the editorial mandate of J.E.P., J.Ed.P., and C.D., non did this tudy examine how the editorial mandates differ across these journals and over time.

Conclusions

The purpose of this study was to find out who the participants in psychological research were, and the changes that has occurred in the subject selection and reporting

practices over the last 80 to 90 years in the three journals through the history of psychology. Criticisms have been made regarding the lack of subject information in psychological reports, and the bias in subject selection which resulted in relying on samples not representative of the general population. Using the content analysis method, demographic variables in 384 empirical research articles from three well-established journals were analyzed.

Findings indicated that the reporting of subject information was inadequate at an overall average of 52% of the items suggested by APA. However, gradual increases occurred over the years to 67% by 1997. Categories most reported were the number of subjects used, who they were, and the type of institutions they were affiliated with. Less frequently reported were age, sex, and geographic location. Categories receiving even less attention were selection procedure, exclusions and reasons, SES, race and ethnicity, and reward.

Further analysis of categories produced extra details which provided some answers to the question of bias. Male bias in subject choice was noticed in the years 1917, 1937, and 1957. However, a more balanced male-female ratio was observed in 1977 and 1997 articles. There was also a definite bias toward the use of university undergraduates in J.E.P. and in J.Ed.P. to a lesser extent. Participation of young children from lab schools affiliated with the universities was also common in the earlier years of J.Ed.P. and C.D. research. With this bias towards university students and university affiliated subjects, it could be expected that these subjects were well-educated, or were children likely with educated parents.

Dominant age groups of subjects were varied among the journals, J.E.P. favored young adults, J.Ed.P. used school aged children the most, and C.D. used infants and young children. Race and ethnicity as well as SES were not reported much except for C.D. in 1997. Where reported, subjects were predominantly white and middle class. It should be noted that are limitations to making meaningful conclusions with the low report rates of these variables.

Information concerning procedure for subject selection was limited when only 36% of the 384 articles reported it. Using volunteer and subject pools from universities, entire

classes at nursery and grade schools, birth announcement, birth record files, residents and patients from special institutions were some of the methods of selecting subjects. There was usually no explanation to why certain classes or schools were selected. The use of convenience samples was very common, random sampling was rarely practiced, and representativeness of samples was uncertain as shown by the results of this content analysis.

Implications

The findings of this study revealed that published reports often did not include some important variables regarding subject description. Despite its importance, there had been an apparent lack of guidelines for researchers in compiling subject demographic information. The characteristics of subjects who participated in an experiment often determine the population to which the findings can be generalized. Also, when characteristics of the subjects are inadequately described, readers do not know if the researchers has controlled for the effects of these characteristics which may affect the results (Brookshire, 1983). The lack of subject information should be a cause for concern since it can have negative effects on generalizations. Comprehensive descriptions can assist readers to more adequately interpret, evaluate, and extend research findings.

In developmental research, it is essential to describe the children sample completely and accurately. All children are not alike, and transformations and changes occurring in the society affect them continuously. Hernandez (1997) argued the existence of great diversity in children's environment at any one point in time, and it is necessary to provide demographic information in developmental research.

Adequate subject descriptions are also important and necessary for future replication and extensions of the experiment by other researchers. Enough details and information has to be available so that the experiment could be replicated with similar or different samples and populations to strengthen and extend the findings and increase confidence in the external validity of the experiment.

It is evident that samples used in psychological research are often convenience samples of limited representativeness. Easily accessible student samples who are young in age, have above average intelligence, abilities, and other unique characteristics are only

accurate representations of college students but not of ordinary people in everyday life. Heavy reliance on this narrow database may distort or misrepresent the causal relationship in research and flaw the conclusions (Sears, 1986). A sample's representativeness is restricted when it does not reflect the essential properties of the population from which it is selected. College students would never be truly representative of the total adult population, and findings based on them would have limited applicability to other groups.

Subject selection procedure had not been included in research reports in general. Those reporting usually did not explain why a particular sample, a certain school or class was chosen. The lack of description seemed to indicate a lack of selection procedure, and as a result a lack of randomly selected samples. External validity of the research could be affected when samples were not random and when sample description were inadequate. Random sampling was so infrequent that researchers should be concerned, and consumers of psychological knowledge should be aware of the limitations of research findings with regard to generalizability to other populations and settings.

There should be more awareness of issues surrounding gender, race, ethnicity, social and special interest groups in today's pluralistic state of society. With enormous changes occurring in society, researchers should be aware of the diversity of culture and recognize the changing times. It is noted that society shapes research, and research should reflect changes of the complexity of contemporary society. White, middle class, university affiliated research participants are not necessarily representative of the population in today's society. Hernandez (1997) reported that in 1994, only 62% of the U.S. population were white, U.S. born non minority having U.S. born parents. Minorities were under represented in many fields of psychology. For example, in the psychotherapy and clinical area, there is a need for adequate number of minorities in research so the therapists can gain knowledge and ensure provision of services to the diverse population.

The preference of male subjects in earlier years had perhaps resulted in construction of theories and models of behavior with little relevance for females (Smart, 1966). Even though the male-females ratio of samples has been more balanced in recent years, there is

often the failure to examine gender differences resulting in inappropriate generalization. For example, Kohlberg's (1984) model of moral development was being criticized for sampling only males by Gilligan (1982) who suggested females address moral issues in a "different voice". In other research, McHugh et al. (1986) suggested that failure to report gender composition of the sample may reflect the author's implicit assumption that gender is irrelevant to the topic or that gender played no important role in the results obtained.

This study has investigated the limitations of subject reporting and biases in subject selection. Disparity has been found between suggested inclusion and actual reporting. It is evident that improvement and changes are necessary, and several recommendations will be discussed in the following section.

Recommendations

The inadequacy of subject description in psychological research reports and the importance of including demographic variables were discussed. Inconsistencies in reporting still exist even though there have been changes and improvements over the years. In order to achieve the goal of adequate reporting of subject information, it is suggested that APA revises its recommendation for subject description to emphasizing inclusion of all basic demographic factors such as age, sex, race, SES, and other variables relevant to the interpretation of results. Researchers should be made more aware that it is necessary to provide thorough descriptions of the demographics of their samples in order to allow evaluation of the representativeness of the samples and generalizability of the results. Replications and extension of findings will not be possible without sufficiently provided information.

Journal editors should realize the importance and significance of this issue and exercise their influence in assuring better descriptions of subjects. It should be mandatory that complete subject descriptions be included in all manuscripts before they are considered for publication. In fact, journal editors should provide guidelines listing standards and expectations and inform authors of the requirements of describing samples.

As suggested by White and Duker (1973), there is also the possibility of using census tract data, not a perfect choice but one readily available, to provide information on income, education, and ethnic background of the residents in the region where the sample is taken from, provided the sample is representative of the population.

Regarding biased samples of college students, more efforts are needed to sample from the non-college population. College and university enrollment in 1995-1996 was only 2.8% of the total population in Canada (Statistic Canada, 1999), and 7.8% in the United States in 1995 (U.S. Bureau of the Census, 1998). Many studies are limited by an exclusive use of well-educated, predominantly white and young samples that are easily accessible on university campuses. College students will never be representative of the adult population, and research findings based on them will have limited applicability to other groups. According to 1997 population reports (U.S. Bureau of the Census, 1998), young adults between 18 and 24 made up of only 9.3% of the population in the United States. At the same time, Canadian statistics reported that in 1996, ages 15-19 and 20-24 made up of 6.7% and 6.8% of the population respectively (Statistic Canada, 1999). It is recommended that a greater effort must be made to conduct research on other samples that are more representative of the general population such as those in other age groups and education levels than the average college students. With the population becoming older, research need to be conducted on persons from other life stages than late adolescence in order for the findings to be relevant for the general population.

In view of past criticisms of psychological research becoming raceless (Graham, 1992), and womanless (Crawford & Marecek, 1989), race and gender must be integrated into theory and research. With contemporary societies becoming more culturally diverse, college students are not reflective of the large non-student, less educated, and lower income populations. Researchers should be more aware of the race and ethnic origins of the general population when they select samples. Visible minorities made up of 17.3% of the 1997 population in the United States (U.S. Bureau of the Census, 1998), and 11.2% of the 1996 population in Canada (Statistic Canada, 1999). Demographic information should be taken into consideration by researchers during the subject selection process to attain more representative samples. Special effort should be made to include minorities

where there is large conglomeration of minority groups, for example, in Toronto (31.6% in 1996) and Vancouver (31.1% in 1996). In addition, consideration should be made for culturally and linguistically diverse groups where appropriate such as, for example, the French Canadians.

In developmental research, children samples should come from more diverse sources and background, not primarily from university affiliated laboratory and nursery schools, and children of university students who are likely to be white, have educated parents, and have lower level of emotional and behavioral problems. The is especially problematic in clinical children research when samples are not always representative of the impoverished children who are more likely to need and receive clinical services for their maladjustment (Betan et al., 1995).

It is also important to require detailed description of selection and recruitment procedures which would assist readers to evaluate the representativeness of the samples as well as to carry out replications. Research methodology textbook writers should place more emphasis on the importance of subject selection and random sampling, topics often inadequately discussed. Sears (1986) noted that authors generally did not mention subject selection at all, and there was no particular concern about consequences of the neglect. It appears that students who might become future researchers need to be educated about the proper procedures of subject selection. Also, journal editors should start to require more representative and randomly chosen subjects in research reports. More literature is needed to guide researchers to employ appropriate selection procedures and compile meaningful subject descriptions.

Replication should be a more common practice to ensure findings are not biased due to some form of bias in the research process such as the use of biased samples. Follow-up replications using a broader range of subject populations should be encouraged as good research practices. The use of replication can strengthen and extend findings, permitting wider generalization and higher degree of external validity.

Psychology is a fast growing discipline with a wide variety of fields of research. It is essential that stringent standards are enforced in inadequate areas such as poor reporting of subject information and biased subject selection. Thorough descriptions of

research samples and research processes will make it possible for a more comprehensive evaluation of the external validity of published research. Researchers should aim to avoid research procedures that may lead to limited generalizability, and be more aware of the need to present more complete and valid conclusions that can further advance psychological knowledge.

References

American Psychological Association (1983). Publication manual of the American Psychological Association (3rd ed.). Washington, D.C.: Author.

American Psycholgical Association (1994). Publication manual of the American Psychological Association (4th ed.). Washington, D.C.: Author.

Baltes, P.B., Reese, H.W., & Nesselroade, J.R. (1977). Life-span developmental psychology: Introduction to research methods. Monterey, CA: Brooks/Cole.

Berelson, B. (1952). Content analysis in communication research. Glencoe, IL: Free Press.

Betan, E.J., Roberts, M.C., & McCluskey-Fawcett, K. (1995). Rates of participation for clinical child and pediatric psychology research: Issues in methodology. Journal of Clinical Child Psychology, 24, 227-235.

Blanchard, D.C. & Griebel, G. (1995). Gender bias in the preclinical psychopharmacology of anxiety: Male models for (predominantly) female disorders. Journal of Psychopharmacology, 9, 79-82.

Bordens, K.S. & Abbott, B.B. (1996). Research design and methods: A process approach. Mountain View, CA: Mayfield.

Boring, E.G. (1953). A history of introspection. Psychological Bulletin, 50, 169-189.

Brookshire, R.H. (1983). Subject description and generality of results in experiments with aphasic adults. Journal of Speech and Hearing Disorders, 48, 342-346.

Brower, D. (1948). The role of incentive in psychological research. The Journal of General Psychology, 39, 145-147.

Campbell, D.T. & Stanley, J.C. (1966). Experimental and quasi-experimental designs for research. Chicago: Rand McNally.

Cartwright, D. (1949). Some principles of mass persuasion: Selected findings of research on the sale of United States was bonds. Human Relations, 2, 253-267.

Christie, R. (1965). Some implications of research trends in social psycholgy. In O. Klineberg & R. Christie (Eds.), Perspectives in social psychology. New York: Holt, Rhinehart, & Winston.

Council of Learning Disabilities Research Committee (1992). Minimum standards for the description of participants in learning disabilities research. Learning Disability Quarterly, 15, 65-70.

Coch, L. & French, J.R., Jr. (1948). Overcoming resistance to change. Human Relations, 11, 512-532.

Cowles, M. & Davis, C. (1987). The subject matter of psychology: Volunteers. British Journal of Social Psychology, 26, 97-102.

Craig, J.R. & Metze, L.P. (1986). Methods of psychological research. Monterey, CA: Brooks/Cole.

Crawford, M. & Marecek, J. (1989). Psychology reconstructs the female. Psychology of Women Quarterly, 13, 147-165.

Dane, F.C. (1990). Research methods. Pacific Cove, CA: Brooks/Cole.

Danziger, K. (1985). The origin of the psychological experiment as a social institution. American Psychologist, 40, 133-140.

Danziger, K. (1990). Constructing the subject: Historical origins of psychological research. New York: Cambridge University Press.

Erikson, E.H. (1963). Childhood and society. New York: Norton.

Festinger, L., Schachter, S., & Back, K. (1950). Social pressure in informal groups: A study of a housing project. New York: Harper.

Gall, M.D., Borg, W.R., & Gall, J.P. (1996) Educational research: an introduction. White Plains, N.Y: Longman.

Galton, F. (1907). Inquiries into the human faculty and its development. London: J.M. Dent.

Gilligan, C. (1982). In a different voice: Psychological theory and women's development. Cambridge, MA: Harvard University Press.

Goldenson, R.M. (Ed.) (1984). Longman dictionary of psychology and psychiatry. N.Y.: Longman.

Goodwin, C.J. (1995). Research in psychology: Methods and design. N.Y.: J. Wiley & Sons.

Graham, S. (1992). "Most of the subjects were white and middle class": Trends in published research on African Americans in selected APA journals, 1970-1989. American Psychologist, 47, 629-639.

Green, K.E. (1991). Reluctant respondents: differences between early, late, and nonresponders to a mail survey. Journal of Experimental Education, 59, 268-276.

Greenerg, B.S. (1980). Life on television: Current analyses of U.S. TV drama. Norwood, N.J.: Ablex.

Gustav, A. (1962). Students' attitudes toward compulsory participation in experiments. The Journal of Psychology, 53, 119-125.

Heiman, G.W. (1999). Research methods in psychology. Boston, MA: Houghton, Mifflin.

Hernandez, D.T. (1997). Child development and the social demography of childhood. Child Development, 68, 149-169.

Higbee, K.L., Lott, W.J., & Graves, J.P. (1976). Experimentation and college students in social-personality research. Personality and Social Psychology Bulletin, 2, 239-241.

Higbee, K.L., Millard, R.J., & Folkman, J.R. (1982). Social psychology research during the 1970s: Predominance of experimentation and college students. Personality and Social Psychology Bulletin, 8, 180-183.

Higbee, K.L. & Wells, M.G. (1972). Some research trends in social psychology during the 1960s. American Psychologist, 27, 963-966.

Holmes, D.S. (1967). Amount of experience in experiments as a determinant of performance in later experiments. Journal of Personality and Social Psychology, 7, 403-407.

Holsti, O.R. (1969). Content analysis for the social sciences and humanties. Reading, MA: Addition-Wesley.

Jackson, W. (1999). Method: Doing social research. Scarborough, Ont.: Prentice-Hall.

Jennings, M.K. & Niemi, R.G. (1981). Generations and politics. Princeton, N.J: Princeton University Press.

Kirkpatrick, S.A. (1976). Aging effects and generational differences in social welfare attitude constraint in the mass public. Western Political Quarterly, 29, 43-58.

Kohlberg, L. (1984). Essays on moral development: vol 2. The Psychology of moral development. New York: Harper & Row.

Korn, J.H. & Hogan, K. (1992). Effect of incentives and aversiveness of treatment on willingness to participate in research. Teaching of Psychology, 19, 21-24.

Koulack, D. & Keselman, H.J. (1975). Ratings of psychology journals by members of the American Psychological Association. American Psychologist, 30, 1049-1053.

Kreiner, D.S., Alvarado, M., & Shockly, S.R. (1997). Memory characteristics of college students who volunteer for research. Psychological Reports, 80, 515-520.

Krejcie, R.V. & Morgan, D.W. (1970). Determining sample size for research activities. Educational and Psychological Measurement, 30, 607-610.

Lasagna, L. & von Felsinger, J.M. (1954). The volunteer subject in research. Science, 120, 359-361.

Lazarsfeld, P.F., Berelson, B., & Gaudet, H. (1948). The people's choice. New York: Columbia University Press.

Leahey, T.H. (1997). A history of Psychology: Main currents in psychological thought. Upper Saddle River, N.J.: Prentice-Hall.

Leary, M.R. (1995). Introduction to behavioral research methods. Pacific Grove, CA: Brooks/Cole.

Low, K.G. & Joliceour, M.R. (1994). Women participants in research: Assessing progress. Women and Health, 22, 79-98.

Lubin, B., Levitt, E.E., & Zuckerman, M. (1962). Some personality differences between responders and nonresponders to a survey questionnaire. Journal of Consulting Psychology, 26, 192.

Mace, K.C. & Warner, H.D. (1973). Ratings of psychology journals. American Psychologist, 23, 184-186.

McHugh, M.C., Koeske, R.D., & Frieze, I.H. (1986). Issues to consider in conducting nonsexist psychological research: A guide for researchers. American Psychologist, 41, 879-890.

McLoyd, V.C. & Randolph, S.M. (1984). The conduct and publication of research on Afro-American children: A content analysis. Human Development, 27, 65-75.

Miller, S.A. (1987). Developmental research methods. Englewood Cliffs, NJ: Prentice-Hall.

Miranda, J. (1996). Introduction to the special section on recruiting and retaining minorities in psychotherapy research. Journal of Consulting and Clinical Psychology, 64, 848-850.

Orne, M. (1962). On the social psychology of the psychological experiment. American Psychologist, 11, 776-783.

Peery, J.C. & Adams, G.R. (1981). Qualitative ratings of human development journals. Human Development, 24, 312-319.

Phares, V. & Lum, J.J. (1996). Family demographics of clinically referred children: What we know and what we need to know. Journal of Abnormal Child Psychology, 24, 787-801.

Plutchik, R. (1983). Foundations of experimental research. New York: Harper & Row.

Ponterotto, J.G. (1988). Racial/ethnic minority research in the Journal of Counseling Psychology: A content analysis and methodological critique. Journal of Counseling Psychology, 35, 410-418.

Porter, A.L. (1978). A comparison of the various ratings of psychology journals. American Psychologist, 33, 295-299.

Rabinowitz, J.C., Mandler, G., & Patterson, K.E. (1977). Determinants of recognition and recall: accessibility and generation. Journal of Experimental Psychology: General, 106, 302-329.

Ray, W.J. (1997). Methods toward a science of behavior and experience. Pacific Grove, CA: Brooks/Cole.

Rosenthal, R. (1965). The volunteer subject. Human Relations, 18, 389-406.

Rosenthal, R. & Rosnow, R.L. (1975). The volunteer subject. New York: Wiley.

Rosnow, R.L. & Rosenthal, R. (1997). People studying people: Artifacts and ethics in behavioral research. New York: W.H. Freeman.

Rosnow, R.L. & Rosenthal, R. (1999). Beginning behavioral research. Upper Saddle River, N.J.: Prentice-Hall.

Ross, L., Green, D., & House, P. (1977). The "false consensus effect": An egocentric bias in social perception and attribution processes. Journal of Experimental Social Psychology, 13, 279-301.

Scherman, A. & Doan, R.E., Jr. (1985). Subjects, designs, and generalizations in volumes 25-29 of the Journal of Counseling Psychology. Journal of Counseling Psychology, 32, 272-276.

Schmitt, J.F. & Meline, T.J. (1990). Subject descriptions, control groups, and research designs in published studies of language-impaired children. Journal of Communication Disorders, 23, 365-382.

Schultz, D.P. (1969). The human subject in psychological research. Psychological Bulletin, 72, 214-218.

Sears, D.O. (1986). College sophomores in the laboratory: Influences of a narrow data base on social psychology's view of human nature. Journal of Personality and Social Psychology, 51, 515-530.

Shaughnessy, J.J. & Zechmeister, E.B. (1997). Research methods in psychology. New York: McGraw Hill.

Smart, R.G. (1966). Subject selection bias in psychological research. The Canadian Psychologist, 7, 115-121.

Statistic Canada. (1999). The 1999 Canadian year book. Ottawa, Canada.

Sutherland, S. (1990). The international dictionary of psychology. New York: Continum Publishing Co.

Thorn, B.M. & Henley, T.B. (1997). Connections in the history and systems of psychology. Boston: Houghton Mifflin.

Tomporowski, P.D., Simpson, R.G., & Hager, L. (1993). Method of recruiting subjects and performance on cognitive tests. American Journal of Psychology, 106, 499-521.

U.S. Bureau of the Census. (1998). Statistical abstract of the United States: 1998. Washington, D.C.

White, M.A. & Duker, J. (1973). Suggested standards for children's samples. American Psychologist, 28, 700-703.

Wickstrom, S., Goldstein, H., & Johnson, L. (1985). On the subject of subjects: Suggestions for describing subjects in language intervention studies. Journal of Speech and Hearing Disorder, 50, 282-286.

VITA

Surname: Chan Given Names: Grace Sau-Yan

Place of Birth: Hong Kong, China

Educational Institutions Attended:

University of Victoria	1993-1999
University of Victoria	1971-1974
Camosun College	1970-1971

Degrees Awarded:

B.A.	University of Victoria	1974

PARTIAL COPYRIGHT LICENSE

I hereby grant the right to lend my thesis to users of the University of Victoria Library, and to make single copies only for such users or in response to a request from the Library of any other university, or similar institution, on its behalf or for one of its users. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by me or a member of the University designated by me. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Title of Thesis:

Changes in Experimental Subject Selection and Reporting in Psychological Research (1917-1997)

Author 

Grace Sau-Yan Chan
December 23, 1999