

TASK FORCE ON RESEARCH ETHICS IN EDUCATION:
*Sub-committee on Quantitative Experimental Single Case Design

QUANTITATIVE SINGLE CASE DESIGN:
GUIDELINES FOR
TEACHER/PRACTITIONER RESEARCH

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Quantitative Single-Case Designs (Issues)

INTRODUCTION

According to Kazdin (1982) “quantitative single-case designs have been used in many areas of research including psychology, psychiatry, education, rehabilitation, social work, counseling, and other disciplines... The unique feature of these designs is the capacity to conduct experimental investigations with the single case” (p. 3). The goal of the single case design is to identify a cause and effect relationship between variables for a single individual. Kazdin indicates that the single case can be done with one subject or individual subjects. In addition Gall, Gall and Borg (2005) highlight the dual role of teachers and counselors as researchers when using single-case research designs because they are both treatment provider and researcher.

Although we recognize, as indicated in the *Action Research: Guidelines for Teacher/Practitioner Research*¹, that “the research design of a proposed project is up to the student and their academic supervisor(s) to determine” (p.1) the following are issues that may arise as you explore the single case research design. These guidelines were created in consultation with a group of experienced researchers and are intended to assist graduate students and their supervisors in the Faculty of Education with completing their Ethics Application to ensure that the study to be undertaken involves procedures that are consistent with the current ethical standards of research practice outlined in the Tri-Council Policy Statement on “Ethical Conduct for Research Involving Humans” (TCPS)².

This document is not intended to replace, nor in any way substitute for the full *Annotated Guidelines For Completing The Human Research Ethics Board Application For Ethics Approval For Human Participant Research*. Please read and follow the full guidelines when completing your application (available on the Office of Research Services (ORS) website: <http://www.research.uvic.ca/forms/index.htm#HREC>).

All graduate students must obtain approval from the Human Research Ethics Board (HREB) prior to beginning their graduate research project, thesis or dissertation. Professional codes of ethics that bind teachers are not sufficient for their research activities. Practitioner-researchers must follow the university ethics guidelines which adhere to the TCPS, as well as to their professional codes of conduct.

¹ * Please read the “Action Research: Guidelines for Teacher/Practitioner Research” (Task Force on Research Ethics in Education, 2005) for extended guidelines and support.

² The Tri-Council Policy Statement on “Ethical Conduct for Research Involving Humans” (TCPS) was developed by the three major research councils of Canada (SSHRC: Social Sciences and Humanities Research Council; NSERC: National Sciences and Engineering Research Council; and CIHR: Canadian Institute of Health Research).

FREE AND INFORMED CONSENT

Issues

1. Teachers or service providers working with children with exceptional needs are involved with families in a reliable alliance where they must change their role from "that of an expert to an ally or friend who enables families to articulate what they need" (Kalyanpur & Rao, 1991, p. 531). The issue of gaining informed consent concerns the close relationship between the parents/guardians and teacher and how this relationship has the potential to be used in a coercive manner to engender consent from parents/guardians and the children/youth.
2. There may be challenges in clearly describing the instructional technique/treatment to parents/guardians and other individuals in the letter of informed consent including the reason why only two or three individuals will receive this treatment based on their special needs.
3. Teacher/researchers must inform parents/ guardians and students/clients in the Letter of Informed Consent that if they voluntarily agree to participate, then they are giving "permission to use information derived from instruction/therapy." The issue arises with the unique feature of quantitative single-case experiments involving the treatment and study of individuals one at a time (Gall, Gall, & Borg, 2005).

Guidelines

These issues have the potential to influence free and informed consent. It is important for the practitioner-researcher to plan and explain to families how students/clients will receive individualized support from the treatment provider in order to implement a systematic approach to instructional or therapeutic interaction.

SAFEGUARDS FOR FREE AND INFORMED CONSENT

Here are some points to keep in mind:

- The neutral third party recruitment must take place in research that involves dual-role and power-over relationships. This neutral party can explain to participants that "the educational treatment and assessment of treatment success is a regular part of the program designed for the individual in the educative/professional setting" (Refer to information regarding "dual relationships" on page one of *Action Research: Guidelines for Teacher/Practitioner Research*).
- This neutral third party can explain to potential participants that this instruction/treatment is generally administered to one child at a time in the

educative/professional setting because of the specialized nature of the individual's needs (Refer to issue #2 and #3 found on page one).

- The neutral party can then explain that “the letter of informed consent gives the teacher/counselor informed permission to use the 'data' (e.g., behavioral frequency counts, test scores etc.) gathered during the course of regular instruction and assessment for the teacher/counselor's own research project. The teacher/counselor's research project will examine instruction/therapeutic success in the larger arena of applicability to other children with exceptional needs *through replication*. “ (Refer to issue #2 found on page one)
- If participants choose *not to participate* and to disallow the use of the data for research purposes their child will still be involved in individualized instruction/ treatment because it is a regular part of the programs designed for the individual. (Refer to issue #2 found on page one)
- The neutral party can also read the letter to parents/ guardians, and provide an information letter so that the parents/ guardians are free to make an informed choice regarding their involvement. (Refer to issue #1 found on page one).

ONGOING CONSENT

Issue

According to Kennedy (2005) “depending on the situation, observations, may occur throughout a school day, once per day, several times per week, once a week, or once a month” (p. 37). In addition, Kennedy indicates that three data points are considered a minimum baseline to “note patterns of behavior to compare to intervention” (p. 38) over repeated phases of assessment (data collection). Therefore, there will be a need to obtain ongoing consent from participants and their parents/guardians.

Guidelines

Planning of the baseline and intervention sequences should be made in advance, conveyed in the letter of informed consent, and the parents/ guardians and students/ clients should be given opportunities throughout the research to withdraw from allowing the assessment information to be used in the study.

Safeguards for Ongoing Consent

Here is a point to keep in mind:

- Quantitative single-case designs may have three or more baseline periods (Kennedy, 2005). These baseline periods *could be the times* when a letter is

sent to parents/ guardians and other involved individuals by the neutral third party to remind them that they are included in the research. At these junctures individuals are given the opportunity to withdraw from allowing the “data” gathered during instruction/therapy to be used in the study

ANONYMITY AND CONFIDENTIALITY

Issues

The number of individual's in applied quantitative single-case designs will be small and specifically selected and individually administered the treatment/ instruction because of each individual's developmental needs. This may make participants recognizable to children and adults in the educative/professional setting and perhaps the community after the research is made public. These issues of anonymity and confidentiality may prove a challenge for researchers in offering "privacy to participants" (Creswell, 2005).

Guidelines

Programs are developed, adapted, and modified to meet specialized needs in the educative/professional setting. Individualized instructional/therapeutic strategies are used regularly to target the developmental needs of the individual. Members of the larger community are naturally aware of modified strategies/techniques used with individuals in the educative/professional setting. Results of the instructional strategy/therapy are shared with the individual and her/his parent/guardian. However, it is still imperative to protect participants' identities both as individuals and groups when the research information and results are made public.

Safeguards for Anonymity and Confidentiality

Here are points to consider:

- A neutral third party may collect and securely store the letters of free and informed consent on the researcher's behalf. This neutral third party should be someone who is not directly working with the children or adults in the educative setting. The teacher/counselor-researcher may then conduct the instruction as a regular part of the curriculum and educational practices in the classroom.
 - In this way the child/youth or client who receives specialized instructional/therapeutic programming on a regular basis has the potential to be known by others in the educative/professional setting. Yet, the names of the students/clients who have given free and informed consent to participate in the study will be withheld from the teacher/counselor-researcher until the final phase of the baseline and

intervention assessment results are collected and employed to create a new program for the student/client.

- Although names of participants will not be provided, the neutral third party may inform the researcher of the number of participants still freely consenting to participate in the study. Therefore, in the letter of informed consent, parents must be informed that participant numbers not names will be given to the researcher at the three baseline periods. Parents will be informed that this information is given to help the researcher to appraise her/him of the status of the research project.
- After the phases of assessment results are collected it may prove a great challenge to protect the confidentiality of small numbers of participants (one to three children/clients) when producing written discussion of the findings. This can be done by providing global geographic locations of communities, generalized descriptions of services provided by the educational facility, pseudonyms assigned to students/clients, and generalized descriptions of the individual's appearance and temperament.

RISKS AND BENEFITS

Issues

Single case designs use special procedures to achieve tight control over, and precise description of the experimental situation: frequent observations of the behaviours targeted for change; description of the treatment in sufficient detail to permit replication; tests of reliability of observations of the individual's behavior and replication of treatment effects within the experiment. There is a vast educative and therapeutic difference between developing unit plans that include consideration of specialized needs in the educative and professional setting and the rigorous data collection, presentation and analysis of instructional/therapeutic strategies found in research employing a quantitative single-case design.

Guidelines

The participants need to be assured that the benefits to this research outweigh the risks.

Safeguards to convey the Risks and Benefits to Participants

Here are points to consider:

- The participants need to be informed of the disadvantage of the research. The strategy may not be successful with the student/client despite the literature supporting its effectiveness in other educative contexts.

Safeguards to convey the Risks and Benefits to Participants (continued)

- The participants also need to be informed of the benefits of the research specifically that the precise description of the experimental situation can provide clear indications of how the student/client responded during the multiple phases of the study and provide direction for successful future programming. Furthermore, if the instructional strategy has been successful while controlling for other influential yet external factors then careful application of these processes can change behaviors of relevance to educators. With this in mind the quantitative single-case research design has the potential to improve the instructional/therapeutic practices of the researcher and other professionals because of the rigor of the experimental design.

OTHER THINGS TO CONSIDER:

Obtaining Permission from Authorities Prior to Conducting Research

See the *Action Research: Guidelines for Teacher/Practitioner Research*.

Recruiting Participants and Power-Over

Issues

Teachers/counselors will do the research in their own client-based contexts because the goal of applied quantitative single-case design research is for teachers/counselors to implement instructional techniques and base their instructional decision-making on objective data analysis of student performance rather than on their personal perceptions (Kennedy, 2005).

1. Quantitative single-case design sample size is often small (e.g., three) when working with children with special needs in the regular classroom.
2. The students are pre-identified in order to track the experimental effects of the intervention.
3. The recruitment targets children and youth with specific developmental needs (e.g., behavioural) in order to support teacher implementation of a systematic approach to instructional practices to improve student learning (Lagermann, 2002).

Guidelines

The recruitment process needs to reflect consideration for the privacy and anonymity of the participants.

Safeguards for Recruitment and Power-Over

Here are points to consider:

- A neutral third party representative must be asked to contact potential participants. This third party will provide the initial information letter indicating that the use of this instructional/therapeutic strategy is a regular part of programming for the student/client. In addition the neutral third party will collect and secure signed consent forms for the researcher (Refer to issue #1 and 2 found on page 6)
- This representative will provide information letters at the three baseline periods giving participants an opportunity to withdraw their child's data from the research (Refer to issue #2 and #3 found on page 6).

Recruitment of Children Under the Age of 13

Issues

1. Children under the age of 13 may not be able to respond to age appropriate verbal scripts written for chronologically aged peers due to the student's/client's maturational delays.
2. Children under the age of 13 need to know that they will still receive the instruction but they are asked to give consent to use the results from the instruction in a research study.

Guidelines

Children under the age of 13 require parent authorization.

Safeguards for Recruitment of Children Under the age of 13

- Children under age 13 who may not be able to respond to verbal scripts should have scripts written with suggestions from the *Action Research: Guidelines for Teacher/Practitioner Research* for chronologically younger participants (Refer to issue #1 found on page 7)
- In addition the scripts for recruitment can be read aloud to the participant. (Refer to issue #1 found on page 7)
- In the recruitment of children under age 13 it must be clear to the child that (a) s/he will receive the classroom instruction and observation, (b) that if the child says "yes," the information from the instruction may be used to help other children with special needs. (Refer to issue #2 found on page 7)

Recruitment of Youth Aged 13 to 16

Issues

1. Youth aged 13 to 16 may not be able to provide their own consent due to their individual maturational delays.
2. Youth aged 13-16 may not be able to respond to verbal scripts written for chronologically aged peers.

Guidelines

Youth aged 13 to 16 can provide their own consent in minimal risk studies yet, researchers usually inform the parents/guardian.

Safeguards for Recruitment of Youth aged 13-16

- In the case where a youth's maturational ability prevents her/him from understanding the letter of consent, the neutral third parties can also inform the parents/ guardians/guardians (Refer to issue #1 found on page 7)
- For youth aged 13-16 who may not be able to respond to verbal scripts should be written with suggestions from the *Action Research Guidelines for Teacher/Practitioner Research* for younger participants (Refer to issue #2 found on page 7)
- In addition the scripts for recruitment can be read aloud to the participant. (Refer to issue #2 found on page 7)
- In the recruitment of youth aged 13 to 16, it must be clear to the youth that (a) s/he will receive the classroom instruction and observation, (b) that if the child says "yes," the information from the instruction may be used to help other children with special needs. (Refer to issue #2 found on page 7)

Data Doing Double Duty

Issue

Single-case designs have provided tremendous insights into processes that improve educational practices and outcomes for a variety of student/clients. Once the instructional strategy/treatment is implemented and tested the findings are used by the teacher to plan for successive instruction. In this way the use of quantitative single-case research design is part of a cycle of assessment beginning with baseline, intervention, and baseline to note positive change over time.

Guidelines

Data in the single-case design is material used to assess students/clients as a regular part of the teacher/counselors role in systematic planning of instruction/therapy. “This data may serve ‘double duty’ and participants therefore have a choice about the use of their work for the teacher/counselor research project” (Task Force on Research Ethics in Education, 2005; p.7).

Safeguards for Data Doing Double Duty

Please consider these points:

- Acknowledge the conflict of interest in the introduction letter, letter of informed consent, and intermittent letters sent during the intervention/baseline phases of the study. Refer to the Task Force on Research Ethics in Education and the guidelines.

Student Records

Issues

The following questions arise:

- Can personal records or files be accessed by the researcher?
- What will happen to individual record keeping of baseline information and intervention results and personal records or files?

Guidelines

Access to personal records or files of previous services and programs developed for the student/client are considered private and application for their use must conform to ethical, professional and privacy legislation (Task Force on Research Ethics in Education, 2005). This procedure not only respects and protects the rights of participants but also respects the professionalism of the researcher...

Safeguards for Use of Student Records

Please consider these points:

- Personal archival records or files can only be accessed by gaining informed consent in writing from the participants.
- Instructional/therapeutic planning is a part of regular programming for students and clients in educative and professional settings. Assessment information of a particular student/client (e.g. running records, anecdotal records, results from tests, frequency counts of behaviors, and duration of behaviors etc.) is normally shared only with the child herself/himself and

her/his parents/ guardians. Parents/ guardians and their child must give free and informed consent based on the free choice to participate in the study unless the family has given their informed consent on behalf of the child.

References

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