

Fifty years of the critical incident technique: 1954–2004 and beyond

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ABSTRACT It has now been 50 years since Flanagan (1954) published his classic article on the critical incident technique (CIT) – a qualitative research method that is still widely used today. This article reviews the origin and evolution of the CIT during the past 50 years, discusses CIT's place within the qualitative research tradition, examines the robustness of the method, and offers some recommendations for using the CIT as we look forward to its next 50 years of use. The focus of this article is primarily on the use of the CIT in counselling psychology, although other disciplines are touched upon.

KEYWORDS: *counselling psychology, critical incident technique, qualitative research, University of British Columbia*

It has now been 50 years since Flanagan (1954) wrote his classic article on the critical incident technique (CIT). During the intervening years, the CIT has become a widely used qualitative research method and today is recognized as an effective exploratory and investigative tool (Chell, 1998; Woolsey, 1986). Evidence of its ubiquitous presence lies in the fact it has been more frequently cited by industrial and organizational psychologists than any other article over the past 40 years (Anderson and Wilson, 1997). However, its influence ranges far beyond its industrial and organizational psychology roots. It has been utilized across a diverse number of disciplines, including communications (Query and Wright, 2003; Stano, 1983), nursing (Dachelet et al., 1981; Kempainen et al., 1998), job analysis (Kanyangale and MacLachlan, 1995; Stitt-Gohdes et al., 2000), counselling (Dix and Savickas, 1995; McCormick, 1997), education and teaching (LeMare and Sohbat,

2002; Oaklief, 1976; Parker, 1995; Tirri and Koro-Ljungberg, 2002), medicine (Humphery and Nazarath, 2001; McNabb et al., 1986), marketing (Derbaix and Vanhamme, 2003; Keaveney, 1995), organizational learning (Ellinger and Bostrom, 2002; Skiba, 2000), performance appraisal (Evans, 1994; Schwab et al., 1975), psychology (Cerna, 2000; Pope and Vetter, 1992), and social work (Dworkin, 1988; Mills and Vine, 1990), to name but some of the fields in which it has been applied.

When writing about the CIT, Flanagan clearly stated the critical incident technique 'does not consist of a single rigid set of rules governing such data collection. Rather it should be thought of as a flexible set of principles that must be modified and adapted to meet the specific situation at hand' (1954: 335). Although a strength of the technique, this flexibility may have become a double-edged sword since it seems to have both encouraged the proliferation of approaches and terminology, as well as allowed for innovative and insightful research studies in many different fields. An example of the former is the fact that when surveying the CIT literature for this article it became evident the terminology used is inconsistent across studies, even among those that are clearly following Flanagan's method. For instance, the terms critical incident technique (Bradfield, 2000), critical incident analysis (Gould, 1999), critical event technique (Kunak, 1989), critical incidents technique (Schwab et al., 1975), critical incident exercise (Rutman, 1996), critical incidents (Pope and Vetter, 1992), critical incident study technique (Cottrell et al., 2002), critical incident report (Kluender, 1987), and critical incident reflection (Francis, 1995) are all examples of the terms being used for studies utilizing the CIT research method. An example of the latter is the fact that, although the CIT is an outgrowth of the research done as part of the Aviation Psychology Program of the US Army Air Forces during World War II (Flanagan, 1954), it has been successfully adapted not only for job analysis using expert observation of critical incidents, but also for counselling psychology and nursing using self-reports of psychological concepts such as emotional immaturity (Eilbert, 1957) and nurses' perception of their psychological role in treating rehabilitation patients (Rimon, 1979). The method's flexibility is also demonstrated in the focus of a CIT study, which can range from studying effective and ineffective ways of doing something, to looking at helping and hindering factors, collecting functional or behavioural descriptions of events or problems, examining successes and failures, or determining characteristics that are critical to important aspects of an activity or event (Flanagan, 1954).

It appears the CIT has evolved and changed during the past 50 years, especially in its use as a tool for counselling psychology research. It strikes us that it is time to consolidate what is known about the CIT, and perhaps to begin standardizing its use and terminology without compromising the underlying flexibility of the method. The purpose of this article is therefore four-fold: (1) to survey the evolution of the CIT and important areas of

development over the past 50 years; (2) to discuss CIT's place within the qualitative research tradition; (3) to examine the research using CIT that has been conducted at the University of British Columbia (UBC) in Vancouver, Canada; and (4) to offer some recommendations for using this method as we look forward to its next 50 years. Although other disciplines will be touched upon, the primary focus of this article is on the use of the CIT as a research method within the field of counselling psychology.

In writing this article, the authors reviewed over 125 articles, theses, dissertations, and book chapters about the CIT, ranging in dates from 1949 to 2003. This included 74 articles, nine books, 44 dissertations and theses, three paper presentations and one report.

Origin, description, and evolution of the CIT

ORIGIN OF THE CIT

The critical incident technique has its roots in industrial and organizational psychology, having been developed during World War II as an outgrowth of the Aviation Psychology Program of the US Army Air Forces (USAAF) for selecting and classifying aircrews (Flanagan, 1954). Its development was subsequently continued at the American Institute for Research, a non-profit scientific and educational organization founded at the end of the war by some of the psychologists who had worked in the USAAF Aviation Psychology Program. John C. Flanagan was among these psychologists, and in its early years the CIT was used primarily to determine the job requirements critical for success in a variety of jobs across a number of industries (Flanagan, 1949, 1954; Oaklief, 1976; Stano, 1983). Flanagan (1954) also highlighted other ways in which the CIT had been used up to that point: measuring typical performance, training, measuring proficiency, selecting and classifying personnel, designing jobs, creating operating procedures, designing equipment, determining motivation and leadership attitudes, and counselling and psychotherapy. Although the CIT was written about during its development in the 1940s (Flanagan, 1949), it was not until his landmark 1954 article that Flanagan detailed its genesis, evolution, and the procedures that have become characteristic of the research method.

DESCRIPTION OF THE CIT RESEARCH METHOD

As described by Flanagan (1954), the CIT has five major steps: (1) ascertaining the general aims of the activity being studied; (2) making plans and setting specifications; (3) collecting the data; (4) analyzing the data; and (5) interpreting the data and reporting the results. Although each of these is discussed briefly below, the interested reader is also referred to Stano (1983), Oaklief (1976), and Woolsey (1986) for thorough general descriptions of the CIT. Descriptions on using the CIT specifically for job analysis can be found in Stitt-Gohdes et al. (2000), Chell (1998), and Anderson and Wilson (1997); its

use in nursing is well described in Keatinge (2002). What follows is an overview of Flanagan's description of the CIT.

Since the primary use of the CIT by Flanagan and his colleagues (1954) was as a tool to create a functional description of an activity, determining the aim or objective of that activity became a basic condition before any other aspect of the study could proceed. Understanding the general aim of the activity is intended to answer two questions: (1) what is the objective of the activity; and (2) what is the person expected to accomplish who engages in the activity? According to Flanagan, determining the aim of the activity can be achieved by asking supervisors who are thought to be experts in the area under study, or by asking the people who actually perform the work. Since different stakeholders may have different orientations towards the aim of an activity, Flanagan considered the primary criterion for determining the aim to be the use to be made of the activity's functional description once it is formulated. He stated, 'The most useful statements of aims seem to center around some simple phrase or catchword which is slogan-like in character' (Flanagan, 1954: 337). The goal is then to get a number of experts in the field to agree on these objectives.

The second step in the CIT is that of setting plans and specifications. At this stage, Flanagan (1954) advocated that precise and specific instructions be given to observers – in essence to ensure that everybody is following the same set of rules. In general, Flanagan believed that four specifications needed to be decided upon: (1) defining the types of situations to be observed; (2) determining the situation's relevance to the general aim; (3) understanding the extent of the effect the incident has on the general aim; and (4) deciding who will be making the observations (e.g. experts in the field, supervisors, consumers of the product or service, or individuals performing the activity). By having everyone work according to the same set of rules, Flanagan believed objectivity for the observations being made could be achieved, as well as consistency across observers, both of which were in keeping with the scientific principles of his day.

The third step of the CIT is collecting the data. This can be done in a number of ways, such as having expert observers watch people perform the task in question or by having individuals report from memory about extreme incidents that occurred in the past (Flanagan, 1954). Although Flanagan preferred expert observers to gather data, he was also pragmatic enough to realize this was not always possible. He spent some time gathering evidence supporting the accuracy of recalled incidents, suggesting that accuracy can be deduced from the level of full, precise details given by the participant. Flanagan advocated four ways of obtaining recalled data in the form of critical incidents: (1) individual interviews; (2) group interviews; (3) questionnaires; and (4) record forms – recording details of incidents either in narrative form or by placing a check mark beside an activity on a pre-existing list of the most likely activities to be observed. Related to data collection is the

concept of sample size. Flanagan stressed that in a CIT study the sample size is not determined by the number of participants, but rather by the number of critical incidents observed or reported and whether the incidents represent adequate coverage of the activity being studied. There is no set rule for how many incidents are sufficient. As Flanagan states, 'For most purposes, it can be considered that adequate coverage has been achieved when the addition of 100 critical incidents to the sample adds only two or three critical behaviors' (p. 343). The crucial thing here is to ensure the entire content domain of the activity in question has been captured and described.

The fourth step involves analyzing the data. Many researchers (Flanagan, 1954; Oaklief, 1976; Woolsey, 1986) consider this to be the most important and difficult step in the CIT process as several hundred critical incidents can be difficult to work with and classify, and there is generally no one right way to describe the activity, experience, or construct. The purpose at this stage is to create a categorization scheme that summarizes and describes the data in a useful manner, while at the same time 'sacrificing as little as possible of their comprehensiveness, specificity, and validity' (Flanagan, 1954: 344). This necessitates navigating through three primary stages: (1) determining the frame of reference, which generally arises from the use that is to be made of the data (e.g. the frame of reference for evaluating on-the-job effectiveness is quite different than that required for selection or training purposes); (2) formulating the categories (an inductive process that involves insight, experience, and judgment); and (3) determining the level of specificity or generality to be used in reporting the data (e.g. a few general behaviours, or several dozen quite specific behaviours). Practical considerations generally determine the level of specificity or generality to be used.

The fifth and final step is that of interpreting and reporting the data. Flanagan (1954) suggested researchers start by examining the previous four steps to determine what biases have been introduced by the procedures used and what decisions have been made. He advocated that limitations be discussed, the nature of judgments be made explicit, and the value of the results be emphasized in the final report. Flanagan (1954: 355) also stated, 'The research worker is responsible for pointing out not only the limitations but also the degree of credibility and the value of the final results obtained'. This is a key point that relates directly to the credibility and trustworthiness discussion to follow.

EVOLUTION OF THE CIT

Since Flanagan's early work describing the CIT was published in the 1940s and 1950s, it appears there have been four major departures from the way he originally envisioned the method. First, CIT was initially very behaviourally grounded and did not emphasize its applicability for studying psychological states or experiences (Stano, 1983). This changed when Eilbert (1953) used the CIT to examine the psychological construct of emotional immaturity, and

Herzberg et al. (1959) used the CIT to study work motivation. Two decades after his landmark article, Flanagan himself applied the CIT to studying the quality of life in America (1978). At about the same time, another CIT study examined linkages between cognitions and emotions (Weiner et al., 1979).

Woolsey's (1986) article focused on applying the CIT to counselling and psychotherapy research, which was no doubt an extension of Flanagan's (1954) references to the early use of the CIT in this discipline. In her article, Woolsey advocated the CIT's potential use as a research method unique to counselling as a discipline, suggesting it was consistent with the skills, values and experience of counselling psychologists. She cited its strengths as they applied to that discipline: its flexibility in being able to encompass factual happenings, qualities or attributes, not just critical incidents; its ability to 'use prototypes to span the various levels of the aim or attribute (high, medium, low)' (Woolsey, 1986: 251); its capacity to explore differences or turning points; and its utility as both a foundational/exploratory tool in the early stages of research and its role in building theories or models. Since then many researchers have utilized this research method to study a wide array of psychological constructs and experiences, including perceptions of problems facing work groups (DiSalvo et al., 1989), managers' beliefs about their roles as facilitators of learning (Ellinger and Bostrom, 2002), the experience of unemployment (Borgen et al., 1990), liked and disliked peer behaviours (Foster et al., 1986), distinguishing quality service and customer satisfaction (Iacobucci et al., 1995), academic resiliency in African-American children (Kirk, 1995), healing for First Nations people (McCormick, 1997), psychologists' ethical transgressions (Fly et al., 1997), stress and coping at work (O'Driscoll and Cooper, 1996), and the role of a psychological contract breach (Rever-Moriyama, 1999), to list just some of the diverse research projects that used the CIT to investigate critical psychological concepts or factual happenings rather than overt critical behaviours.

The second way in which the CIT has changed since it was introduced by Flanagan (1954) has to do with the relative emphasis put on direct observation versus retrospective self-report. Although Flanagan acknowledged that retrospective self-report could be used, virtually his entire article was written from the perspective of trained observers or experts collecting observations of human behaviour, either by direct observation or by workers keeping diaries as they work. Indeed, the very description of the CIT reflects this emphasis: 'The critical incident technique consists of a set of procedures for collecting direct observations of human behavior in such a way as to facilitate their potential usefulness in solving practical problems and developing broad psychological principles' (Flanagan, 1954: 327). This perspective is reflected in much of the early writing about the CIT (Oaklief, 1976; Stano, 1983). However, as Kluender (1987) points out, it is difficult to find examples of CIT studies that record behaviour as it occurs, primarily, we suspect, because it is very labour intensive and therefore expensive to gather data this

way. Our review of CIT studies undertaken since 1987 revealed that virtually all of them followed Nagay's (cited in Flanagan, 1954) and Herzberg et al.'s (1959) leads by using retrospective self-report (Bradfield, 2000; Janson and Becher, 1998; Narayanan et al., 1995; O'Driscoll and Cooper, 1996; Schmelzer et al., 1987; Tully and Chiu, 1998; Wetchler and Vaughn, 1992). As already discussed, the criterion for accuracy of retrospective self-report is based on the quality of the incidents recounted. If the information provided is full, clear, and detailed, the information is thought to be accurate (Flanagan, 1954; Woolsey, 1986). If the reports are general and less specific, the information may not be useful.

The third major departure from Flanagan's (1954) conceptualization of the CIT appears to be the way in which the data is analyzed. Flanagan thought the categorization process was more subjective than objective, with no simple rules available to guide the researcher. He described the process this way:

The usual procedure is to sort a relatively small sample of incidents into piles that are related to the frame of reference selected. After these tentative categories have been established, brief definitions of them are made, and additional incidents are classified into them. During this process, needs for redefinition and for the development of new categories are noted. The tentative categories are modified as indicated and the process continued until all the incidents have been classified. (p. 344–5)

Detailed descriptions of data-analysis procedures that are consistent with Flanagan are offered by Woolsey (1986) and Bailey (1956).

Although some of the studies reviewed for this article indicated they followed procedures similar to Flanagan's (1954), many of them did not include descriptions of their data-analysis procedures (Chapman, 1994; Humphery and Nazareth, 2001; Pope and Vetter, 1992; Thousand et al., 1986), thus leaving the reader unclear about the exact process that was followed. Others cited Flanagan for the data-collection method used, but then seemed to diverge from the data-analysis procedure as outlined by Flanagan (Cheek et al., 1997; Gottman and Clasen, 1972; Kent et al., 1996; Kirk, 1995; Lansisalmi et al., 2000; Miwa, 2000; Strop, 1995; Thomas et al., 1987; Vispoel and Austin, 1991).

Although it is permissible for researchers to mix and match one or more traditions of inquiry in a single study, it is important that they do so with full knowledge and understanding of each of the traditions being utilized and the extent to which these traditions are similar to or different from one another (Creswell, 1998). One of the hallmarks of the CIT is the formation of categories as a result of analyzing the data (Flanagan, 1954; Woolsey, 1986). These categories may or may not capture the context of the situation and are reductionist by definition. This is not necessarily consistent with the goals or aims of the grounded theory, content analysis, or descriptive phenomenological psychological approaches to analyzing data used in the studies cited in the previous paragraph. We will discuss this issue further in the next section.

The fourth major change in how the CIT is being utilized today appears to be the way in which the credibility or trustworthiness of the findings is established. As Flanagan (1954) pointed out, establishing the credibility of a CIT study is an important responsibility for the research worker. Before discussing this, however, it is necessary to look at the CIT in relation to other qualitative methods in common use today. We will come back to how the credibility of the findings is being handled following the next section.

The CIT and other qualitative methods

Qualitative research has been defined as ‘any kind of research that produces findings not arrived at by means of statistical procedures or other means of qualification’ (McLeod, 1994: 77). Denzin and Lincoln (1994) define qualitative research as follows:

Qualitative research is multimethod in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them. Qualitative research involves the studied use and collection of a variety of empirical materials – case study, personal experience, introspective, life story, interview, observational, historical, interactional, and visual texts – that describe routine and problematic moments and meaning in individuals’ lives. (p. 2)

Creswell’s definition of qualitative research and its characteristics add the concepts of exploring ‘a social or human problem’ and the researcher building ‘a complex, holistic picture’ by analyzing words, reporting detailed views of informants, and conducting the study in a natural setting (1998: 14–16). Flanagan’s description of the essence of the CIT (provided in the previous section) fits these definitions of qualitative research. Specifically, CIT research takes place in a natural setting; the researcher is the key instrument of data collection; data are collected as words through interviewing, participant observation, and/or qualitative open-ended questions; data analysis is done inductively; and the focus is on participants’ perspectives (Creswell, 1998: 16).

As Chell (1998) pointed out, the CIT was developed during a period when the positivist approach to scientific investigation was the dominant paradigm in the social sciences, indeed, in all the sciences. Although it is a qualitative research method, the CIT was initially posed as a scientific tool to help uncover existing realities or truths so they could be measured, predicted, and ultimately controlled within the realm of job and task analysis – ideas that are rooted in the predominant quantitative research tradition of the day. To gain acceptance, early researchers utilizing the CIT often used quantitative language and in some cases used quantitative validity and reliability checks (M. Arvay 2003, pers. comm., 15 September). However, we currently find ourselves in a post-modern (Gergen, 2001), some would say post-structural

(Lather, 1993), research paradigm where qualitative methods are now commonly in use and accepted (Creswell, 1998; Murray, 2003).

Chell (1998) further pointed out that the CIT can be used within either a positivist or a post-modern research paradigm. Within a post-modern environment, the CIT becomes an investigative tool (rather than a scientific tool) that can be used 'within an interpretive or phenomenological paradigm' (Chell, 1998: 51). She goes on to say:

Therefore it is critically important that the researcher examines his/her own assumptions (and predilections), considers very carefully the nature of the research problem to be investigated, and thinks through *how* the technique may most appropriately be applied in the particular researchable case. (p. 51)

This view is consistent with Creswell (1998), as noted in the previous section, as well as with Howe and Eisenhart (1990) and McLeod (2001).

Eisner stated, 'all forms of inquiry, like all forms of representation, have their own constraints and provide their own affordances' (2003: 21). Creswell was more explicit by contending, 'different forms of qualitative traditions exist and that the design of research within each has distinctive features' (1998: 10). He sets out the unique dimensions of five major qualitative traditions by looking at the disciplines' focus, origin, data-collection methods, data analysis, and narrative forms. If we were to add the CIT to Creswell's list of qualitative traditions, we would describe its distinctive features as the following: (a) Focus is on critical events, incidents, or factors that help promote or detract from the effective performance of some activity or the experience of a specific situation or event; (b) Discipline origin is from industrial and organizational psychology; (c) Data collection is primarily through interviews, either in person (individually or in groups) or via telephone; (d) Data analysis is conducted by determining the frame of reference, forming categories that emerge from the data, and determining the specificity or generality of the categories; and (e) Narrative form is that of categories with operational definitions and self-descriptive titles. These features are what distinguish the CIT from other qualitative methods and are, we argue, necessary in order to be true to the method. By placing Flanagan's (1954) description of the CIT research method into Creswell's framework, it has the effect of enhancing the overall soundness of data produced using CIT procedures, yet still allowing for the flexibility that is also a key feature of this method. This leads us back to the issue of establishing the credibility of a CIT study's findings, to which we now return.

The CIT and credibility/trustworthiness checks

As mentioned above, the fourth major way in which the CIT has changed since Flanagan (1954) wrote about it appears to be in the area of the measures used by researchers to convince readers of the credibility of their

research results. Given the evolution of the CIT away from direct observation to retrospective self-report, and from task analysis to examining psychological concepts, how might a researcher establish the credibility of results arising from this qualitative method in a way that is consistent with Flanagan's exhortation to report them as the final step in a CIT study? This is an important question for all qualitative research methods, and thus the solution should be informed by qualitative traditions.

HISTORICAL CREDIBILITY/TRUSTWORTHINESS CHECKS

In reviewing the CIT literature for this article, it became clear there are few standards around credibility and trustworthiness checks to guide researchers engaging in CIT research. The range we encountered went from no credibility checks having been cited at all (Kelly, 1996; Muratbekova-Touron, 2002; Wason, 1994), to a variety of checks used either alone or in combination. Some examples of the latter include a reliability panel of three employees (DiSalvo et al., 1989); triangulation, face validity, and inter-rater reliability (Skiba, 2000); independent raters and cross-case analysis across two groups (Tirri and Koro-Ljungberg, 2002); experts to sort incidents into categories then undertaking a third sort to establish category reliability (Kemppainen et al., 2001); member checks and asking peers, colleagues and experts to examine the categories (Ellinger and Bostrom, 2002); and more extensive checks such as intra-judge reliability, participant checks, inter-judge reliability, category formation and content analysis (Keaveney, 1995).

Two often-quoted studies were undertaken to examine the reliability and validity of the CIT method. The first study by Andersson and Nilsson (1964) looked at the job of grocery store managers in a Swedish company. As part of the study, the researchers studied various reliability and validity aspects of the CIT method, including saturation and comprehensiveness, reliability of collecting procedures, categorization control, and the centrality of the critical incidents to the job. They concluded, 'the information collected by this method is both reliable and valid' (Andersson and Nilsson, 1964: 402). A decade later, a second study by Ronan and Latham (1974) looked at the job performance of pulpwood producers. These researchers examined three reliability measures (inter-judge reliability, intra-observer reliability, and inter-observer reliability), and four validity measures (content validity, relevance, construct validity, and concurrent validity). Their study corroborated Andersson and Nilsson's findings, stating, 'the reliability and content validity of the critical incident methodology are satisfactory' (1974: 61). In addition, Ronan and Latham extended the Andersson and Nilsson study by also showing that 'the CIT's emphasis on relatively observable and objective behaviors permits adequate test-retest reliability (intra-observer) of resulting behavioral measures' (1974: 61). During our review of the CIT literature, we found it was common for researchers either to cite one or both of these studies as evidence of the reliability of the CIT research method (Proulx, 1991;

Young, 1991), or not to refer to the reliability or validity of the method at all (Cowie et al., 2002; Gould, 1999; Parker, 1995; Schmelzer et al., 1987; Thousand et al., 1986).

It appears that the language and procedures used to establish the credibility of findings from a CIT study have tended to follow a more positivistic line. For example, over the years researchers have offered other reliability and validity checks that include retranslation, a standard deviation test, calculating Scott's Pi reliability coefficient, and drawing a new sample of participants from the same population used to generate critical incidents (Stano, 1983). However, although these steps 'may purify the categories and make them homogeneous, it does not assure the validity or completeness of the category system' (Stano, 1983: 9). These steps also rely more on the quantitative research tradition than the qualitative tradition. While this may still be appropriate in other fields, within counselling psychology it may be the time has come to move out of the positivistic quantitative tradition and into the post-modern qualitative tradition when establishing the credibility of results in a CIT study.

Given the changes to the CIT method that have been chronicled in this review, several things struck us. First, there appears to be a lack of literature regarding a standard or recommended way to establish the trustworthiness or credibility of the results in a CIT study. Because of this vacuum, many different and apparently unrelated methods of establishing credibility have historically been in use. Second, the CIT was initially a task analysis procedure that relied on observations or self-reports of observable behaviours. Clearly, by using the CIT for exploring personal experiences, psychological constructs, and emotions, the method has expanded beyond its original scope. Third, both Andersson and Nilsson's (1964) and Ronan and Latham's (1974) studies looked at the CIT within the context of its original task analysis role. Fourth, we think this raises the question of whether the tradition of establishing credibility and trustworthiness in the findings by using these two studies applies to newer research that uses the CIT method for exploring issues that are not related to task analysis. If not, then how can current and future CIT researchers strengthen their arguments that their results are credible?

EMERGING CREDIBILITY/TRUSTWORTHINESS CHECKS

For more than a decade, faculty and graduate students in the Counselling Psychology program in the Department of Educational and Counselling Psychology and Special Education at UBC have been working with the CIT. Two of the initial studies conducted there using the CIT were done by Amundson and Borgen (1987, 1988), following which a number of faculty and graduate students started using this research method. The result is a total of 19 master's theses and doctoral dissertations that used the CIT between the years 1991 and 2003, with several more currently under way. During this time, a series of credibility checks has evolved that we believe are consistent

with Flanagan's (1954) intent (and with others writing about credibility in qualitative research), and also enhance the robustness of CIT findings.

The first master's thesis in the Counselling Psychology program at UBC to use the CIT was Patterson's (1991). She used two methods for establishing the credibility of the categories – participation rate, and a coder who independently extracted critical incidents from the interview transcripts. McCormick's (1994) doctoral dissertation proved to be a turning point for establishing the soundness of the results as it included six different checks, all of which are still in common use. Today, students and faculty at UBC who undertake a CIT study are using a total of nine credibility checks. We turn now to a detailed discussion of these credibility checks, offering them as a proposed protocol for others to follow when conducting a CIT study that is looking at psychological constructs. These checks do not necessarily need to be undertaken in the order discussed.

First, it has become customary to arrange for a person familiar with the CIT to independently extract a number of critical incidents from the taped interviews or transcriptions (Alfonso, 1997; Novotny, 1993). Most frequently this number represents 25 percent of the total critical incidents gathered during the study for reasons of time, cost, and effectiveness. This check is generally referred to as independent extraction of the critical incidents, and is consistent with Andersson and Nilsson's (1964) work. The purpose of this is to calculate the level of agreement between what the researcher thinks is a critical incident and what the independent coder thinks is a critical incident. The higher the concordance rate, the more credible the claim that the incidents cited are critical to the aim of the activity.

Second, the UBC studies are also routinely building a second interview with the participants into the study design. This takes place after the data from the first interview have been analyzed and placed into tentative categories. The purpose of this second interview, known as participant cross-checking, is to give the participants a chance to confirm that the categories make sense, that their experiences are adequately represented by the categories, and to review the critical incidents they provided in the initial interview and either add, delete, or amend them as needed. This check was first introduced by Alfonso (1997) and is considered to be an innovation for the CIT. It is consistent with Fontana and Frey's (2000) call to treat participants as people and respect their expertise in their own histories and perspectives. It is also consistent with Maxwell's (1992) concept of interpretive validity, which he proposes as a credibility measure that can be used across most, if not all, qualitative studies.

Third, an independent judge is asked to place 25 percent of the critical incidents, randomly chosen, into the categories that have tentatively been formed by the researcher. When forming the initial categories, the researcher creates a description of them as well as a title and then submits titles, descriptions, and the random sample of incidents that are now in no particular order to the independent judge for placement into the categories. This has become

known as independent judges placing incidents into categories. Again, the higher the agreement rate between the researcher's placement of incidents into the categories and the independent judge's, the more sound the categories are thought to be. This is consistent both with Flanagan's (1954) data-analysis procedures and with Andersson's and Nilsson's (1964) reliability checks.

Fourth, researchers routinely track the point at which exhaustiveness or redundancy is achieved (Flanagan, 1954; Woolsey, 1986). This is done by tracking the point at which new categories stop emerging from the data, and is considered a sign that the domain of the activity being studied has been adequately covered. Flanagan suggested that adequate coverage of the domain could be assumed when only two or three critical behaviours emerge from 100 critical incidents gathered. This is only a general guideline, however, and needs to be tailored to each specific study. The concept of exhaustiveness formed the basis of one of Andersson and Nilsson's (1964) validity and reliability checks.

Fifth, it has become customary to submit the tentative categories that result from the data analysis to two or more experts in the field (Barbey, 2000; Morley, 2003). This allows these experts to review the categories and state whether they find them useful, whether they are surprised by any of the categories, and whether they think something is missing based on their experience. The rationale is that if the experts agree with the categories, it enhances their credibility. This appears to have been used first by Eilbert (1953), endorsed by Flanagan (1954), then used more recently by McCormick (1994), Alfonso (1997), and Butterfield (2001).

Sixth, the participation rate is calculated by determining the number of participants who cited a specific incident, then dividing that number by the total number of participants. Borgen and Amundson (1984) calculated participation rates in an early CIT study and established a participation rate of 25 percent for a category to be considered valid. This is consistent with Flanagan's (1954) suggestion that the greater the number of independent observers who report the same incident, the more likely it is that the incident is important to the aim of the study. He also reported calculating frequencies in conjunction with ensuring that the headings (or categories) 'cover all incidents having significant frequencies' (Flanagan, 1954: 345), although he did not elaborate further on this point.

Seventh, the concept of theoretical validity (Maxwell, 1992) has been incorporated into the UBC studies. Theoretical validity has to do with the 'presence or absence of agreement within the community of inquirers about the descriptive or interpretive terms used' (Maxwell, 1992: 292). This is being done in two ways at UBC. First, researchers make explicit the assumptions underlying their proposed research and then scrutinize them in light of relevant scholarly literature to see if they are supported (Alfonso, 1997; Butterfield, 2001). Second, researchers compare the categories that are

formed to the literature to see if there is support for them (Maxwell, 1992; McCormick, 1994). This has become known as theoretical agreement. It is important to note that lack of support in the literature does not necessarily mean a category is not sound, as the exploratory nature of the CIT may mean the study has uncovered something new that is not yet known to researchers. The important thing is to submit the categories to this scrutiny and then make reasoned decisions about what the support in the literature (or lack of it) means. Although Flanagan (1954) did not mention theoretical agreement, it is consistent with his endorsement of Eilbert's (1953) use of subject matter experts and his own practice of seeking out authorities, consumers, and others as a way of testing the utility of the initial categories.

Eighth, the concept of descriptive validity in qualitative research (Maxwell, 1992) has to do with the accuracy of the account. It has become routine to tape record research interviews and either work directly from the tapes, or to have them transcribed and work from the transcripts as a way of accurately reproducing the participants' words (Alfonso, 1997). Participant cross-checking is also intended to give participants an opportunity to check the initial categories against their contents, confirm the soundness of the category titles, and determine the extent to which they reflect their individual experiences.

Finally, current UBC studies have added a ninth credibility check to their research designs. This entails asking an expert in the CIT research method to listen to a sample of interview tapes (usually every third or fourth interview) to ensure the researcher is following the CIT method (W.A. Borgen 2003, pers. comm., 14 August). This check, known as interview fidelity, ensures consistency is being maintained, upholds the rigor of the research design, and checks for leading questions by the interviewer. When combined, these nine checks enhance the credibility of the findings because the research protocols consistent with the CIT method are being followed (Creswell, 1998).

Flanagan (1954) made one last suggestion with respect to the credibility of the findings. This has to do with the level of detail provided by the participant/observer regarding a particular critical incident. He suggested the accuracy of an incident could be deduced from the level of full, precise details given about the incident itself. This is something that should be considered by a CIT researcher before an incident is deemed appropriate for inclusion in the study. Flanagan suggested that general or vague descriptions of incidents might mean an incident is not well remembered and therefore should be excluded. This was not included as one of the credibility checks noted earlier because it precedes these nine checks and has more to do with an incident meeting the criteria for inclusion in the study than it does with the overall trustworthiness of the findings. The criteria for incidents to be included in a study are commonly thought to be: (1) they consist of antecedent information (what led up to it); (2) they contain a detailed description of the experience itself; and (3) they describe the outcome of the incident. This format was followed by

virtually all of the UBC theses and dissertations and it, or a variation of it, was frequently found in the CIT literature (Kanyangale and MacLachlan, 1995; Kluender, 1987; Mikulincer and Bizman, 1989; O'Driscoll and Cooper, 1996).

We recognize the credibility checks noted earlier are not necessarily being applied solely to work being done at UBC, as many of the studies already cited in this article included one, two, or more of these checks. However, what is unique to UBC is the extent to which these checks are being used consistently and in concert with each other. They are in keeping with both Flanagan's (1954) initial conceptualization of the CIT and with Woolsey's (1986) application of the CIT to counselling psychology. These credibility checks are also consistent with others' perspectives about establishing the trustworthiness and credibility of qualitative research results (Altheide and Johnson, 1998; Eisner, 2003; Lather, 1993; Maxwell, 1992). They also address many of the objections generally made about qualitative research, such as the findings are not robust, credible, or trustworthy (Kvale, 1994). By bringing this level of scrutiny to CIT data analysis, it also recognizes the calls of researchers to utilize qualitative methods with demonstrated rigor in order to enhance the ecological validity of studies by exploring real-life problems that are relevant to clinical practice and are therefore less esoteric, narrow, and laboratory-bound (Blustein, 2001; Subich, 2001; Walsh, 2001).

Future directions and recommendations

Although much has changed for the critical incident technique during the past 50 years, much has also remained the same. It strikes us that its future is rooted in its past, which entails striking the right balance between respecting the technique's method as articulated by Flanagan (1954), and embracing its inherent flexibility that allows researchers to adapt it for use across myriad disciplines and research questions. The CIT started out as a task analysis tool and, although it is still used as such within industrial and organizational psychology, it has expanded its use in counselling psychology, nursing, education, medicine, and elsewhere to also become an investigative and exploratory tool (Chell, 1998; Woolsey, 1986).

Based on a review of recent studies, it appears the CIT research method is continuing to evolve as it moves into the future, uncovering context (Hasselkus and Dickie, 1990; O'Driscoll and Cooper, 1994; Wodlinger, 1990) as well as capturing meaning (Baum, 1999; Morley, 2003; Pellegrini and Sarbin, 2002; von Post, 1998). There is evidence that researchers using the CIT are now asking participants to reflect upon and write down the meaning of critical incidents, not just discuss them in a research interview (Francis, 1995). This corresponds with the move towards exploring incidents of personal importance and the significance of factors related to critical incidents (Dworkin, 1988; Wodlinger, 1990). There is also evidence the CIT is

starting to focus on eliciting the beliefs, opinions and suggestions that formed part of the critical incident rather than concentrating solely on a description of the incident itself (Cheek et al., 1997). This is consistent with another trend in the CIT literature, namely that of adapting the method to focus more on thoughts, feelings, and why participants behaved as they did (Ellinger and Bostrom, 2002; Kanyangale and MacLachlan, 1995). This builds on the practice of focusing on what a person did, why he/she did it, the outcome, and the most satisfying aspect, which appears to be well established and reflects the work currently being done at UBC and elsewhere (Hasselkus and Dickie, 1990; Morley, 2003). Keatinge's (2002) suggestion that the term 'critical incident' be replaced with 'revelatory incident' as a way of inducing a wider array of examples and experiences from participants may be a reflection of these new directions for and uses of the CIT.

Several recommendations arise from this review of the CIT literature and our own experience using this research method. First, carefully following an established and robust qualitative research method is one part of establishing the credibility of a study's results (Creswell, 1998). Hence, it strikes us as important that researchers embrace and apply the steps of the CIT research method as set out by Flanagan (1954) and the practices discussed here in order to maintain and enhance both its research tradition and its credibility. This should then make it easier to claim that CIT study results are trustworthy or sound.

Second, not only do we need consistency in method, we also need consistency in terminology. Given the lack of consistency around the terminology used to refer to a critical incident technique study, we believe the CIT method would be strengthened by standardizing the term 'critical incident technique' for all studies using this method. It becomes confusing when a plethora of terms is used to refer to the same research method.

Finally, given the evolution of the CIT research method beyond its original use as a task analysis tool into the realm of a qualitative exploratory and investigative tool used for psychological constructs and experiences, it seems important to standardize the credibility and trustworthiness checks used by researchers. We contend it is no longer appropriate for counselling psychology researchers to rely on the studies conducted by Andersson and Nilsson (1964) and Ronan and Latham (1974) in order to establish credibility, for all of the reasons stated earlier. To determine the soundness of the results arising from a CIT study, our recommendation is to standardize use of the credibility and trustworthiness checks discussed earlier in this article. This would consist of routinely incorporating the following nine data-analysis checks into future CIT studies: (1) extracting the critical incidents using independent coders; (2) cross-checking by participants; (3) having independent judges place incidents into categories; (4) tracking the point at which exhaustiveness is reached; (5) eliciting expert opinions; (6) calculating participation rates against the 25 percent criteria established by Borgen and Amundson (1984); (7) checking

theoretical agreement by stating the study's underlying assumptions and by comparing the emerging categories to the relevant scholarly literature; (8) audio- or video-taping interviews to ensure participants' stories are accurately captured; and (9) checking interview fidelity by getting an expert in the CIT method to listen to a sample of interview tapes. Following these data-analysis checks will support a researcher's credibility claims for his or her results, as well as enhance the method's robustness.

It has been a privilege to celebrate 50 years of the critical incident technique by reviewing its origins and evolution, and examining its historical and contemporary contexts. We believe the future of the CIT is promising and full of possibilities, and we look forward to its continued growth over the next 50 years.

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