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Use of Concept Maps to Represent Students' Knowledge of Research Methods in Psychology: A Preliminary Study

Abstract

This paper is a report of research on the potential validity of concept maps as a representation of students' knowledge of research methods in psychology. Concept maps may provide insight into the content and structure of students' knowledge that traditional assessment methods do not. In this paper we examine the rationale underlying the use of concept maps and issues associated with their use. We also report a qualitative study in which we employed concept maps to assess students' knowledge. Finally, there is a description of a potential application of concept mapping to the evaluation of students' knowledge, currently being investigated by the authors.

This paper describes a research project on the use of concept maps as a research tool to assess students' knowledge in a specific content domain. We have then used concept mapping tasks to investigate students' knowledge of research methods in psychology.

This research is built on previous work on the understanding of descriptive statistics by students studying psychology, and students' misconceptions about that domain (Morris, 2001; Morris & Scanlon, 2000). Morris (2001) employed verbal protocol tasks and paper-and-pencil tests to examine students' understanding of correlation; however, there are several techniques that can be used to identify students' conceptions of a domain (Liu, 2001).

One technique for investigating students' conceptions of a domain is the use of concept mapping tasks. Stoddart, Abrams, Gasper, and Canaday (2000) suggested that the concept maps that learners produce allow the measurement of aspects of learning that are not captured by other assessment methods. In the present study, we have examined the potential validity of concept maps in the assessment of knowledge in a domain related to statistical analysis, i.e., research methods.

The Representation and Elicitation of Knowledge

Assumptions Underlying the Use of Concept Maps in Assessment

Researchers have used concept maps to assess students' knowledge acquisition in a variety of domains, including biology, geology, and statistics (Champagne, Klopfer, DeSena, & Squires, 1981; Markham, Mintzes, & Jones, 1994; Schau & Mattern, 1997). White and Gunstone (1992) have suggested that concept mapping can be used to explore students' understanding of concepts within a domain, to explore change in the understanding of these concepts, and to assess whether students understand the purpose of instruction, which may provide unique insight into knowledge acquisition.

The use of concept mapping tasks to assess knowledge acquisition is congruent with *constructivist* approaches to learning, which assume that students acquire knowledge by integrating information gained during an instructional intervention with their pre-existing knowledge (Ausubel, Novak, & Hanesian, 1978). This approach suggests a need to draw a distinction between *rote learning*, the ability to recall information, and *meaningful learning*, the ability to apply information (Mayer & Wittrock, 1996). We suggest here that knowledge should be regarded as information that is employed in the solution of problems by the students.

Over 50 years ago, Ryle (1949) distinguished between two types of knowledge that students could acquire. These were *declarative knowledge*, factual knowledge that can be verbalized, and *procedural knowledge*, which defines the manner in which declarative knowledge is applied. The distinction that was drawn between these two types of knowledge is still generally accepted. Meaningful learning requires the acquisition of both forms of knowledge. Concept maps can provide a means to examine students' declarative knowledge. Declarative knowledge can be regarded as composed of what Eysenck & Keane (1995) referred to as *object concepts*, which define the objects that students encounter, and *relational concepts*, which define the relationships between object concepts and objects, as well as their characteristics. Concept maps represent both the object concepts and relational concepts that underlie students' knowledge within a content domain.

Before discussing the nature of concept maps further, it is important to examine the structures that underlie the information and knowledge that students possess. Researchers have suggested that knowledge held within students' *long-term memory (LTM)* is represented in the form of *schemas*. Schemas are typically conceived of as knowledge structures that represent the declarative knowledge associated with specific contexts (Baddeley, 1997). Schemas encompass hierarchical and sequential relationships that exist among objects, object concepts, and their characteristics in specific contexts (Schank, 1982).

Kintsch (1998)has suggested that schemas themselves could be represented by networks of *propositions*. Each proposition represents a single idea, and comprises a *predicate*, a relational concept, and related *arguments*, which may represent object concepts, objects,

or objects' characteristics (Kintsch, Crothers, Glass, Keenan, McKoon, & Monk,1974; Norman, Rumelhart et al., 1975). The predicate has specific slots that define the number and types of arguments associated with it (Kintsch et al., 1974).

Diekhoff (1983) used the term *structural knowledge* to describe the network of interrelationships within students' declarative knowledge. Reimann & Schult (1996) suggested that knowledge acquisition leads both to quantitative change in declarative knowledge, and to qualitative change. Students do not just acquire greater numbers of propositions, but may represent more abstract relationships within a domain as a result of knowledge acquisition. Underlying this change is the generation of a more complex propositional network, providing new structure for representing students' knowledge. The representation of this structural knowledge may provide a means for demonstrating the occurrence of meaningful learning.

A concept map is a network of propositions, composed of pairs of linked nodes. Each node represents a specific object concept, object, or property, while the link represents the relationship between them. Although this structure appears to support only two arguments, the link is not constrained in form, allowing it to represent clauses, which provides a means to support additional arguments. This structure is congruent with the view of knowledge acquisition and representation described in this paper. Jonassen, Beissner, & Yacci (1993) suggested that concept maps can be used to represent students' structural knowledge. Concept maps and other means of representing knowledge are described in the next section.

Concept Maps and Alternative Means of Representing Knowledge

Concept mapping tasks have been developed to elicit students' structural knowledge. However, there are also a number of other techniques for eliciting structural knowledge. These include *directed graph*, *ordered tree*, and *word association* tasks (Jonassen et al., 1993). Consequently, the question arises as to whether any of these techniques provide more appropriate representations of students' structural knowledge than concept maps.

Unlike concept mapping tasks, directed graph, ordered tree, and word association tasks do not require the student to explicitly identify the relational concepts that arise in a domain (Maskill & Cachapuz, 1989; Shavelson, 1972). These techniques examine the associations made by students between object concepts and objects, and assume that the manner in which objects are categorized represents underlying understanding of the domain (Jonassen et al., 1993; Shavelson, 1972). However, Fensham, Garrard, & West (1982) suggested that this assumption may be false, because students can suggest associations but cannot always identify an appropriate relational concept underlying that association.

In contrast, concept maps require that students explicitly state the relational concept underlying associations between objects, object concepts, and the properties of objects. Although the manner in which propositions are represented differs from that described by

Kintsch (1998), the concept map does allow students to represent the content of their propositions and to demonstrate meaningful learning.

Using Concept Maps to Assess Structural Knowledge

Decisions in the Use of Concept Mapping to Assess Knowledge

Essentially, concept maps may act as useful tools for teachers because they should indicate whether students can demonstrate meaningful learning following participation in an instructional program. There are well known problems with commonly used assessment methods, and indeed the critiques of traditional assessment methods, essay, and multiple-choice tasks by McClure, Sonak, & Suen (1999) and Goldsmith, Johnson, & Acton (1991) have provided support for the use of concept maps in this role; however, these researchers did not acknowledge the unresolved issues surrounding their use. These issues include: disagreement amongst researchers about the format of the concept map, the methods used to elicit it, the manner in which the content of the concept map is assessed, and the degree to which concept maps provide valid representations of structural knowledge. In the next section each of these issues is examined in turn.

Selecting a Format for the Concept Map

Novak & Gowin (1984) assumed, following the theory of knowledge acquisition proposed by Ausubel et al. (1978), that concept maps should be hierarchical, representing students' progressive differentiation of concepts. However, Lawson (1994) suggested that this assumption of hierarchical form was inappropriate, a view reflected in the description of schemas given by Rumelhart & Norman (1985), and Schank (1982) suggested that concept maps should take the form of networks of concepts. Indeed, the form of concept map suggested by Novak & Gowin (1984) is not strictly hierarchical, as their description of concept maps allowed for *cross-links* between different branches within the concept map. These cross-links were believed to represent the students' integration of concepts within a domain.

Approaches to Concept Map Elicitation

Researchers have also suggested a variety of ways in which concept maps can be elicited, including the creation of concept maps from transcripts of clinical interviews with students (Novak & Mussonda, 1991). Although this approach to eliciting concept maps appears promising, because it does not rely on students' skills in producing the artifact, it would require established techniques to guide researchers' concept map construction (Goldsmith et al., 1991). Further, as Novak & Mussonda (1991) found, the unit of analysis can also bias the researchers' beliefs about the conceptions that students hold about the domain. In response, other researchers have suggested that concept maps should be constructed by the students themselves.

Stuart (1985) suggested that students should construct concept maps from recalled domain knowledge. Although this appears a plausible approach to elicitation, the

representation may be biased by the ability of the student to recall LTM-stored knowledge, which may not provide an accurate representation of the knowledge that the student possesses (Tulving, 1967). In response to this problem, other researchers, Wilson (1994) among others, have provided students with relational and object concepts from the represented domain to use in their concept maps. However, this approach appears incompatible with constructivist approaches to learning, which led Kinchin, Hay, & Adams (2000) to suggest that students should add their own relational and object concepts to their concept maps.

Approaches to Concept Map Analysis

If concept maps represent the student's structural knowledge, it should be possible to assess the degree to which change has occurred following participation in an instructional program. Scoring schemes have been suggested by Lomask et al. (1992) among others, as a means to provide a consistent and systematic process to assess concept map accuracy.

Some proposed scoring schemes are adaptations of Novak & Gowin's (1984) scoring scheme. This scheme was based on the notion that the concept map's hierarchical structure indicated whether the student had drawn appropriate abstractions about the domain, and consequently gave a value to each valid hierarchical concept map level. The researchers also suggested that the cross-links between different sub-domains of the hierarchy demonstrated an integration of knowledge in the domain, and should also be given a value.

A number of researchers, including Lomask et al. (1992) have suggested that it is necessary to develop a criterion concept map against which to compare the students' concept maps. However, this can only be considered appropriate if the student is provided with the concepts that should be represented, otherwise, as White & Gunstone (1992) noted, it may be possible to gain a higher score than that gained by reproducing the criterion concept map. Further, the criterion concept map is affected by the identity of the experts consulted to produce it. This led Herl, Baker, & Niemi (1996) to suggest the use of weighted criterion concept maps, in which values for propositions were allocated on the proportion of experts who identified that proposition.

However, there are problems inherent in the use of quantitative concept map scoring schemes. First, the values that researchers assign to concept map components may be arbitrary (Novak & Gowin, 1984). Second, as Lomask, Baron, Grieg, & Harrison (1992) noted, many scoring schemes reported a single aggregate score of concept map quality, even though, as Kinchin et al. (2000) claimed, there was confusion as to what this score represented.

Other researchers, such as Williams (1998) among others, have employed qualitative methods for assessing the quality of students' concept maps. The method used by Kinchin et al (2000) examined the overall structure of the concept map, which characterizes how the student conceives of the domain. The researchers identified three different types of structure that described whether students had identified temporal or

causal sequences within their structural knowledge. As students' conceptions of the domain changed so the overall structure of the concept map was also presumed to change.

Establishing the Validity of Concept Map Assessments

Concept maps are believed to represent students' structural knowledge, a claim that has subsequently been investigated by researchers attempting to establish the reliability and validity of the use of concept maps in assessment. Anderson & Huang (1989) among others have reported research that has attempted to establish the criterion related validity of concept mapping tasks by comparing the results of these with the results of traditional achievement measures. However, this approach cannot provide evidence of the criterion validity of concept maps as representations of student knowledge, because it is unknown whether traditional measures of assessment investigate structural knowledge or provide a measure of meaningful learning (Novak, Gowin, & Johanssen, 1983).

An alternative approach to establishing the criterion-related validity of concept maps is to examine the degree to which concept maps can differentiate between experts and novices, who would be presumed to possess different structural knowledge of a domain. Studies by Lay-Dopyera & Beyerbach (1983) inter alios suggest that concept mapping tasks can differentiate between individuals who possess differing levels of expertise.

Researchers have also examined the degree to which concept maps can be reliably scored. Studies reported by Barenholz & Tamir (1992), among others, have suggested that concept map scoring schemes demonstrate high inter-rater reliability. However, research has yet to examine whether these scores would be consistent over time.

Problems in the Design and Conduct of Concept Mapping Tasks

As we have seen, the use of concept mapping tasks in the assessment of student knowledge presents a series of choices to the researcher. There is still debate about the appropriate form for a concept map, the manner in which concept maps should be elicited, and the manner in which they can be scored.

In the research that has been described in this paper, it appears that the use of concept maps as a means to provide a quantitative measure of students' comparative performance is inappropriate. However, it has been suggested that concept maps may provide a means to elicit from students a representation of the conceptions and misconceptions that they hold about a domain (Rice et al., 1998; Stoddart et al., 2000). Consequently, concept maps could provide a means for identifying the propositions that are held within the students' LTM which would lead students to make errors in the application of their knowledge. As such, concept mapping may provide a means to elicit a representation of students' knowledge that can predict the degree to which this knowledge would be successfully employed.

The above considerations suggest that concept mapping may be an appropriate means to elicit students' knowledge of research methods in the design of research studies. Further, there is no suggestion that any constraints should be placed on the domains in which concept maps can be used. Consequently, it would appear that concept maps could be used as a means to elicit students' knowledge about the relationships between concepts that underlie the principles of scientific research.

Research with students studying psychology has already identified the types of misconceptions that they possess about introductory statistics (Morris, 2001; Morris & Scanlon, 2001). The presence of these misconceptions suggests that psychology students may also possess misconceptions about the concepts underlying the related area of research methods in psychology, and in the experimental method in particular. Concept mapping tasks may provide a means to elicit students' misconceptions about this domain; that is, concept maps may represent misconceptions that may not be apparent to traditional methods of assessing students' knowledge of the domain.

A Study on Concept Map Assessment

Using Concept Maps to Represent Students' Knowledge

As part of research at The Open University, a study investigated the use of concept maps as a means to assess psychology students' knowledge of research methods. This study examined whether scores on a concept mapping task were related to another measure of a student's domain knowledge. The study was conducted with nine undergraduate students from a university in England.

Students in this study were asked to produce three concept maps and to answer a series of short answer questions on topics from the domain of research methods. The students were asked to produce concept maps on the topics of research methods, descriptive statistics, and experimental methods. All knowledge elicitation tasks were presented in a task booklet.

The use of short answer questions was informed by two main considerations. First, short answer questions were used because Morris (2001) found that these could be used effectively to elicit data on students' conceptions about statistics. Second, by adapting answers from textbooks on research methods, such as Coolican (1990), model answers could be specified and used to assess the accuracy of students' conceptions.

Conduct of the Study

The task booklet asked students to complete the three concept mapping tasks, which were non-cued, and the short answer questions. Non-cued concept mapping tasks, in which students are asked to produce a concept map using only the concepts that can be recalled from LTM, were used because there was little research on students' understanding of research methods. This suggested that students should not be constrained in the form and content of the concept maps they produced. The task booklet also contained an example

of a concept map and a description of its components. Students worked through the task booklet individually while they thought aloud. An audio recording was made of the session.

The content of the concept maps was scored according to a scoring scheme devised by Markham, Mintzes, & Jones (1994), described in Table 1. Responses to short answer questions were also scored for accuracy; a point was awarded for each correct response.

Table 1.
*Description of Markham, Mintzes, & Jones (1994) Concept Map Scoring Scheme*

Component	Score	Description
Concept	+1	A concept in the concept map is valid within the represented domain.
Proposition	+1	A connecting line and linking word between concepts indicating a valid, meaningful link.
First Branching	+1	The first valid, meaningful link from a concept.
Subsequent Branching	+3	The second or subsequent valid, meaningful link from a concept.
Hierarchy	+5	A link between concepts in which a concept is more specific and less general than the concept above it in the context of the represented domain.
Crosslinks	+10	A valid link between one segment of the hierarchy and another.
Examples	+1	Specific events or objects that are valid instances of a concept.

Findings about the Completeness of Concept Maps

Students were asked to produce a concept map on the topic of research methods in psychology. Two of the students did not start concept maps, even though encouraged to do so by the researcher. The nature of the remaining concept maps that were produced suggested either that students' were unfamiliar with representing knowledge in the form of a concept map, or that they had limited understanding of psychological research methods. This suggested that it would be difficult to determine whether concept maps could be used to assess their understanding of research methods. This was apparent in the cases of the concept maps produced by participant 3, shown in Figure 1, and participant 8, shown in Figure 2. Three students, including participant 8, included statistical terms on their concept maps. However, they did not relate these appropriately to research methods concepts.
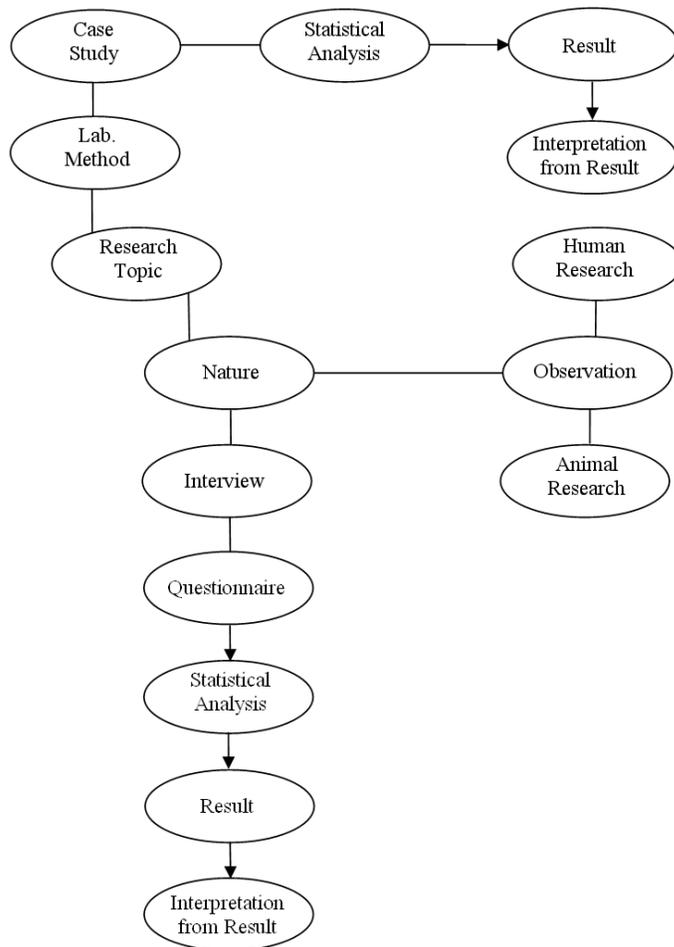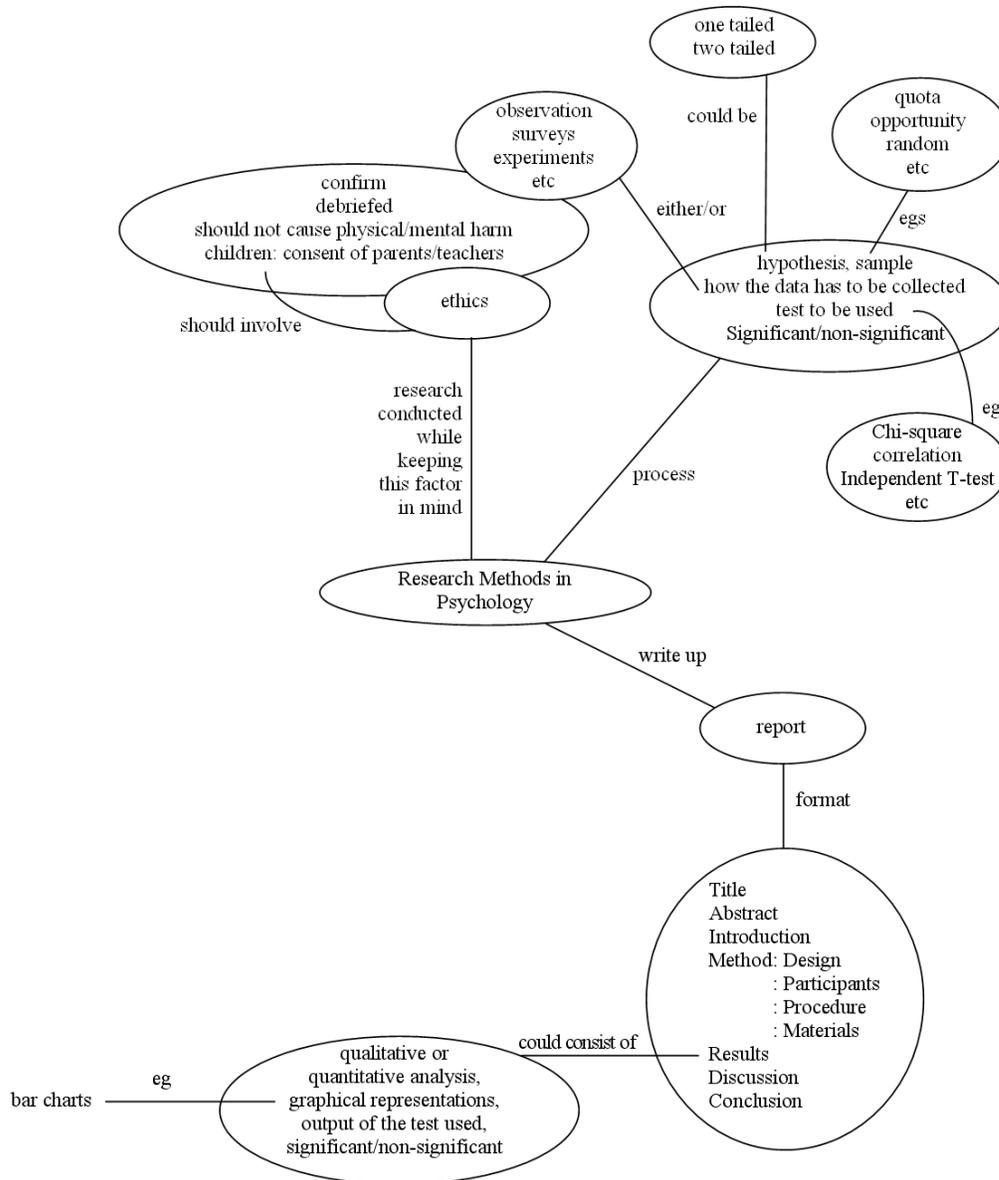
Figure 1. Concept map produced by participant 3 on the topic of research methods in psychology
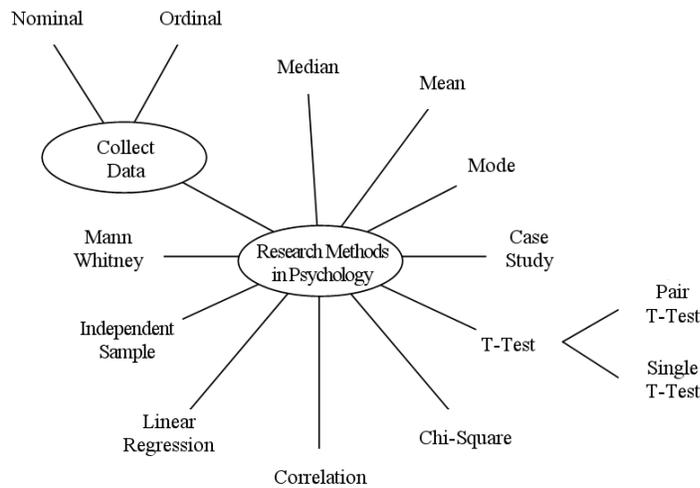
Figure 2. Concept map produced by participant 8 on the topic of research methods in psychology

Only one of the seven students who completed the task labeled the links between concepts, despite being presented with an example and a description of a concept map. However, the concept map produced by this student, participant 9, shown in Figure 3, provided limited insight into his understanding of the topic.

For example, the concept map contains no explicit distinction between qualitative and quantitative methods, although there are references to methods associated with each class of method, such as *observation* and *experiments*. However, it is not clear from the concept map whether the student understands the distinction between these two types of methods, because there is a node that contains *observation, survey and experiments*, etc., and this is linked to another that represents the concepts and stages implicated in the conduct of an experiment.

Figure 3. Concept map produced by participant 9 on the topic of research methods in psychology

Interpretation of the student's understanding of research methods from this concept map is therefore made difficult by the fact that the student includes multiple concepts within a single node. In one node, the student includes concepts associated with the conduct of an experiment, which includes *hypothesis, sample*, *how the data has to be collected, test to be used*, and *significant/non-significant*. Although each of these concepts is associated with the conduct of an experiment, it is not clear that the student is aware of the relationships between these concepts. For example, the student does not describe the relationship that exists between *hypothesis, test to be used*, and *significant/non-significant*. Although the student groups particular concepts correctly, it is unclear whether the student understands the concepts that underlie the subject area. It is difficult

to establish the reasons why students did not include links that would have revealed their understanding of the area in question. Possibly, students may not have believed that the inclusion of these links was necessary or relevant. Alternatively, students may not have understood the concepts or may not have known how to represent these concepts within a concept map.

Students were also asked to construct a concept map for the topic descriptive statistics. Five of the nine students felt able to produce concept maps for this area, but only one of these participants, again participant 9, produced a concept map, shown in Figure 4, that contained labeled links. However, it is again unclear whether this participant understood the concepts that he was describing.

For example, the student includes the concept *central tendencies* and recognizes that this is related to another concept, *description of the data collected*, but whether the student understands what defines measures of central tendency or the reasons why they are calculated is not apparent.

The third concept map that participants were asked to construct was on the topic of experimental methods in psychology. On this task, six of the participant produced concept maps. However, one of the participants produced a concept map that only contained the nodes *animal* (the terms "laboratory" and "observational" were linked to this node), *ethics*, and *human*. Interestingly, two of the students produced a concept map that could be described as a linear flow chart of how to write up a psychology experiment. This may reflect the emphasis that is typically put on structuring a psychological report in undergraduate psychology courses. An example of this type of
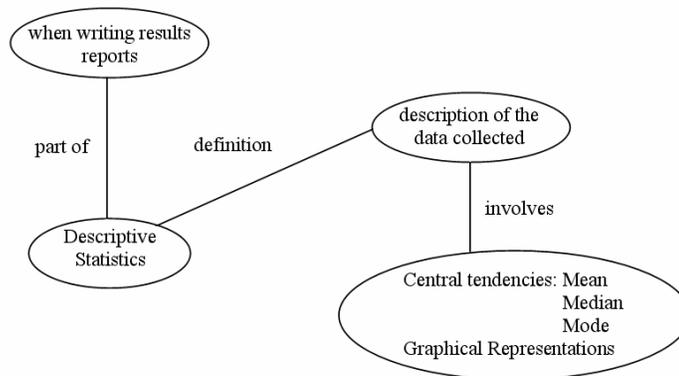
Figure 4. Concept map produced by participant 9 on the topic of descriptive statistics
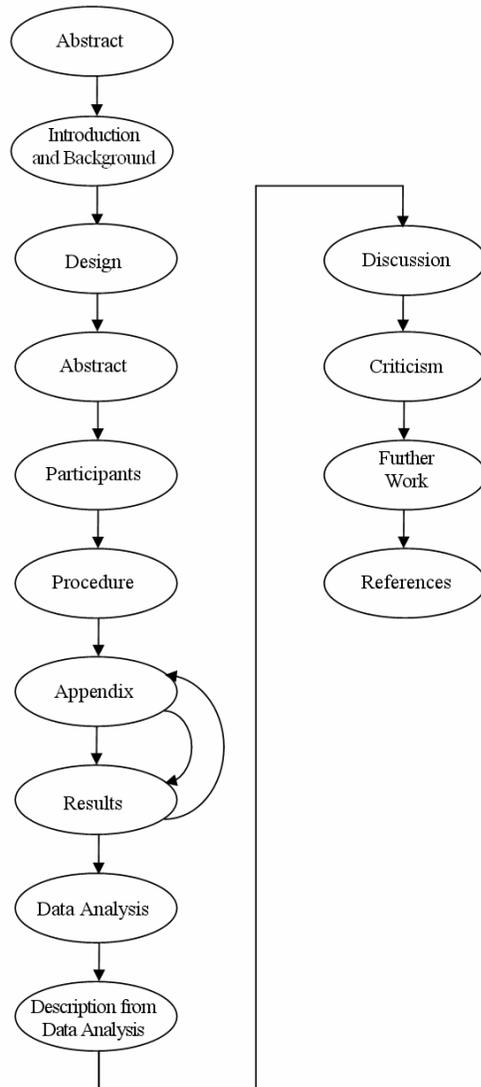
Figure 5. Concept map produced by participant 3 on the topic of the experimental method

Only one of the students constructed a concept map with labeled links, shown in Figure 6. The student who constructed this concept map included nodes and links that describe the process of conducting an experiment and included some of the concepts that underlie this process, but it is not clear from that student's concept map that she understood the relationships among these concepts. For example, although the concept map included references to the concept of *reliability* and whether or not the research is *valid*, the student did not indicate how these concepts were defined. Similarly, although the student included the concepts *control group* and *experimental group*, she did not provide any further information about what these concepts refer to.

The self-selection of concepts to include within a concept map task raises the question of whether participants were able to recognize the limits of the topic about which they had been asked to construct a concept map. For example, as outlined above, for the concept map on the topic of research methods in psychology, types of data analysis, as well as the methods, tasks, and tools that comprise this analysis, were included. In the case of the third concept mapping task, on the use of the experimental method in psychology, concepts were included that referred to the sections that comprise a report. Although these concepts are relevant to the domain being assessed, their inclusion does not necessarily indicate whether or not a student understands the area in question.

Findings about the Scoring of Concept Maps

The concept maps were scored according to a scheme devised by Markham, Mintzes, & Jones (1994), which is a modification of one developed by Novak & Gowin (1984). The use of this concept map scoring scheme for the maps that the students produced illustrated a number of problems in its application.

In the analysis of the concept maps, scoring was done by the first and second authors independently of each other; however, two issues arose. First, it was not clear to the researchers whether links that had not been labeled should be scored as valid or not when the relationships among concepts could be inferred. Second, a question was raised as to whether concepts that were presented together within a single node should be scored as correct or incorrect.
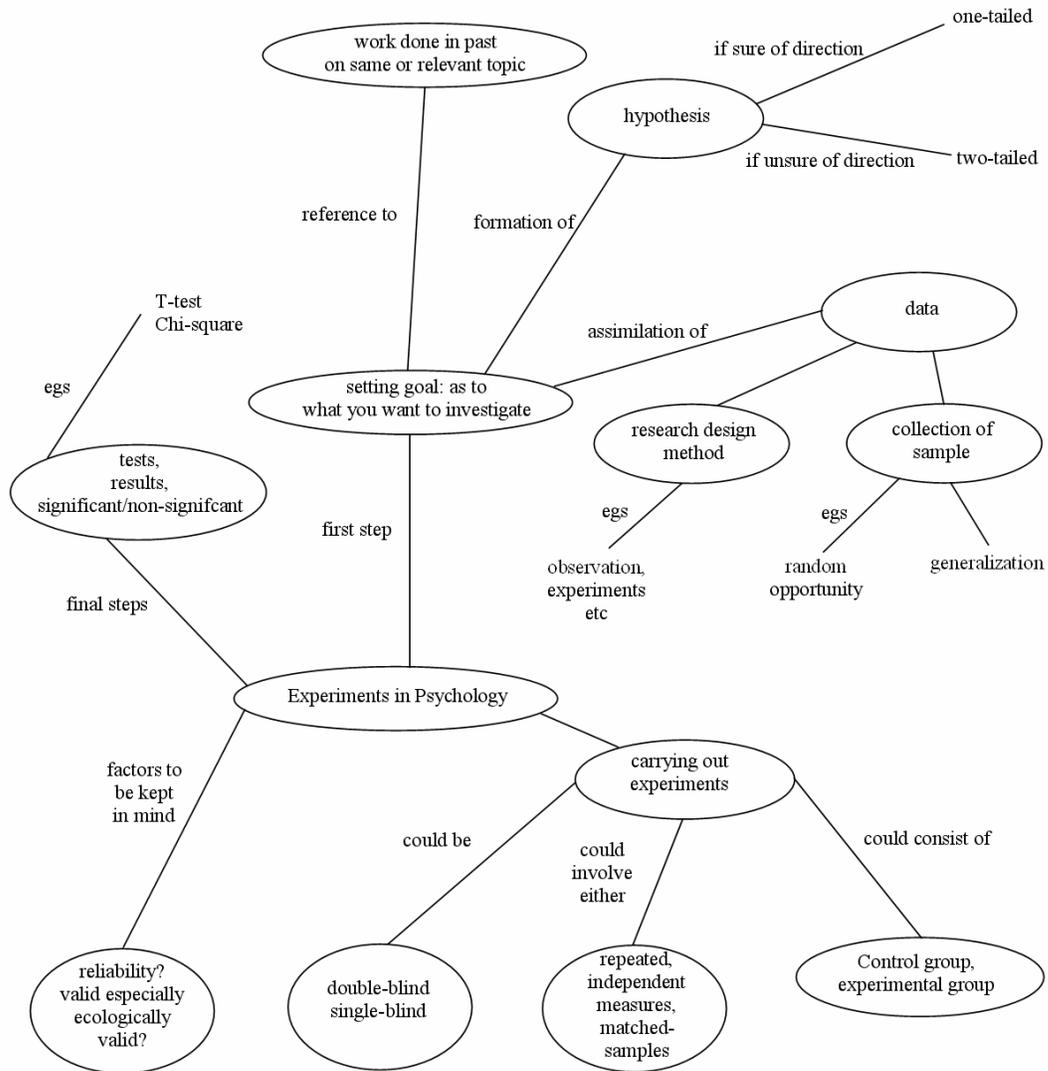
Figure 6. Concept Map Produced by Participant 9 on the Topic of the Experimental Method

Representing Knowledge in the Concept Map

It is possible that concept maps may provide a means to generate a representation of a student's structural knowledge in a more accurate manner than has been the case with traditional knowledge elicitation tasks. Implicit within McClure, Sonak, & Suen's (1999) support for concept mapping is the belief that it does not require the skills that essay composition does, but this does not suggest that concept mapping does not require different skills. This facet of concept mapping activity was apparent from the protocol elicited from one of the participants. This participant was able to describe a number of concepts that were relevant to the topic being assessed, and also relationships among them, but felt unable to note this down in the form of a concept map.

Conclusions and Further Work

The literature review indicates an absence of recommendations about the effective use of concept mapping tasks in assessing students' knowledge. Researchers have disagreed about the concept maps' form, methods used to elicit them, and their evaluation. This study suggests a number of concerns that should be examined in future studies of concept mapping tasks used in assessment.

The findings of this study indicated that participants found constructing the concept map difficult, failing to make appropriate use of its conventions to represent knowledge. Participants typically failed to specify links, or less typically did not produce a concept map at all. Even when a participant included links, that participant might have used them to classify concepts. This provides only limited insight about the participants' conceptions of the domain.

Conduct of this study revealed problems inherent in the use of scoring schemes to assess the quality of concept maps, such as how the scheme should be applied when concept map conventions are not followed. Further, in the use of non-cued concept maps, the concepts that particular students define as salient might not match those of the researcher. If a concept map is used to evaluate students' knowledge of a domain, there could be a need to define the limits of that domain for students.

The authors are conducting a follow up study, whose aims and design have been informed by the findings of this study. In that study we will examine the relationships between/among the conceptions represented in two distinct types of knowledge elicitation task. In addition, we will also examine the processes that are employed by students when constructing a concept map. This study will be conducted with undergraduate psychology students from three universities in England, and will again examine their knowledge of research methods in psychology.

In this follow up study, participating students will be asked to complete a case-study and a concept mapping task on the same subject, and will be provided with the same set of concepts for use in the task, although this does not preclude the inclusion of students' own concepts in their concept maps. While they attempt the concept mapping task, students will also be asked to think aloud in order to provide a representation of the processes being enacted. In contrast to the present study, participating students will be given training in both concept mapping and the use of the computer program that they will be asked to use to create concept maps.

We contend that qualitative analysis techniques will allow the representation of the conceptions produced by the two knowledge elicitation tasks, which should be comparable given that each involves the use of a common set of concepts. Qualitative analysis will also be conducted on the think-aloud protocols produced during participants' interaction with the concept mapping computer program. These data should provide further insight into the potential value of concept mapping tasks and the processes that support the representation of knowledge in this form.

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Résumé

L'Utilisation des Cartes Conceptuelles pour Représenter la Connaissance des Méthodes de Recherche chez les Etudiants de Psychologie : Étude Préliminaire

L'article rapporte une recherche portant sur l'intérêt de l'utilisation des cartes conceptuelles comme représentation des méthodes de recherche par les étudiants de psychologie. Les cartes conceptuelles peuvent en effet autoriser une approche du contenu et de l'organisation des connaissances qui échappent aux évaluations traditionnelles. On se propose ici d'examiner le rationnel et les implications de l'utilisation des cartes conceptuelles. On rapporte également une étude qualitative ayant utilisé cette méthode pour évaluer les connaissances des étudiants. Enfin, on décrit une application de cette méthode en cours d'évaluation par les auteurs.

Resumen

Uso de Mapas Conceptuales para representar el Conocimiento de los Estudiantes de Métodos de Investigación en Psicología: Un Studio Preliminar

El artículo es un resumen de una investigación sobre la potencial validez de los mapas conceptuales, entendidos como una representación del conocimiento de los estudiantes de Métodos de Investigación en Psicología. Se parte del supuesto de que los mapas conceptuales permiten evaluar la profundidad del conocimiento de los estudiantes mejor que los métodos tradicionales de evaluación. En el artículo se examina de forma racional el uso de los mapas conceptuales y las ventajas que se derivan de su uso. También se resume un estudio cualitativo, en el que se ha empleado el uso de mapas conceptuales para evaluar el conocimiento de los estudiantes. Finalmente, hay una descripción de una aplicación potencial de los mapas conceptuales en la evaluación del conocimiento de los estudiantes, que está siendo investigada por parte de los autores.

Zussamenfassung

Die Verwendung von Konzept-Plänen zur Repräsentation des Wissens von Studierenden über Forschungsmethoden der Psychologie: eine vorläufige Studienzusammenfassung

Diese Arbeit ist ein Forschungsbericht über die mögliche Validität von "Konzeptplänen" als Repräsentation des Wissens von Studierenden über Forschungsmethoden der Psychologie. Konzeptpläne können dazu verhelfen, Einsicht in den Inhalt und die Struktur des studentischen Wissens zu vermitteln, was traditionelle Erfassungsmethoden nicht leisten. In diesem Papier untersuchen wir den Leitgedanken, der dem Gebrauch der Konzeptpläne zugrunde liegt sowie Fragen, die mit ihrem Gebrauch assoziiert sind. Ebenfalls berichten wir eine qualitative Studie, in der wir Konzeptpläne anwandten, um das Wissen der Studenten zu erfassen. Schließlich folgt eine Beschreibung einer möglichen Anwendung von Konzeptplänen zur Überprüfung von studentischem Wissen, die wir gegenwärtig untersuchen.

Abstract Italiano

L'impiego di mappe concettuali per la rappresentazione della conoscenza di metodologie della ricerca psicologica da parte degli studenti: uno studio preliminare

L'articolo riferisce di una ricerca sulla validità potenziale delle mappe concettuali come rappresentazione della conoscenza da parte degli studenti dei metodi di ricerca psicologica. Le mappe concettuali possono offrire indicazioni interessanti sul contenuto e la struttura della conoscenza da parte degli studenti, più di quanto non sembrino fare metodi di valutazione tradizionali. Oltre a esaminare il razionale alla base dell'impiego delle mappe concettuali e ad alcune tematiche associate al loro uso, l'articolo riferisce di uno studio qualitativo nel quale tali strumenti sono stati utilizzati per valutare la conoscenza degli studenti. Da ultimo viene descritta un'applicazione potenziale della mappatura concettuale alla valutazione della conoscenza da parte degli studenti, attualmente oggetto di indagine da parte degli autori.