

ABSTRACT

Title of Dissertation: INVESTIGATING DIFFERENCES IN
STRUCTURAL KNOWLEDGE AND
METACOGNITIVE PROCESSES AMONG
LAY HELPERS ADVANCED STUDENTS
AND SENIOR PROFESSIONAL
THERAPISTS

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Therapist expertise is associated with the use of complex knowledge structures and metacognitive processes. A cross sectional ex-post facto design assessed differences in structural knowledge and metacognitive processes between lay helpers, advanced students, and senior professional therapists. A card sorting task involving 19 therapist intentions was used to assess the following structural knowledge indicators: minutes to complete a card sort, number of card sort categories, and card sort score. Metacognitive processes were assessed using an adaptation of the Metacognitive Awareness Inventory and the Self-reflection subscale of the Self-Reflection and Insight subscales. An inverse U shaped relationship was found in where compared to lay helpers and senior professional therapists; advanced student's had higher card sort scores, indicative of greater consistency with a sample of experienced therapists. Compared to lay helpers and advanced students, senior professional therapists used significantly more time to sort therapist intentions and sorted intentions into a greater number of categories. Relative to metacognitive

process, advanced students and senior professional therapists reported significantly greater knowledge of cognition than lay helpers. Also, advanced students also reported greater self-reflection than both lay helpers and senior professional therapists. Discriminant analysis assessed the potential for a linear combination of structural knowledge indicators and metacognitive processes to differentiate participants by level of therapist development. Self-reflection and card sort scores discriminated advanced students from senior professionals, whereas knowledge of cognition and minutes to complete the card sort discriminated experienced professionals from lay helpers. Multidimensional scaling analysis was used to assess the optimal structural configuration of the pooled card sort data and yielded a 4 dimensional solution of the 19 therapist intentions. Results were consistent with Skovholt and Ronnestad's (1992) model of therapist professional development. Results also supported the attenuating effect of ill defined problems on problem solving ability of highly experienced individuals in their respective domain. The study concludes with implications for training, therapy, and research.

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STUDENTS AND SENIOR PROFESSIONAL THERAPISTS

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Chapter 1: Introduction

Expertise describes the characteristic knowledge and skills that distinguish exemplary performance from typical and mediocre performance. Whether it is Beethoven's 4th symphony, a Tiger Woods tee-shot landing 350 yards down a narrow tree-lined fairway, or the strategic moves of a chess master, what distinguishes highly skilled individuals in a domain from that of relatively less skilled individuals is complex and only recently beginning to be understood.

Expertise research reflects the existing theory on the factors that distinguish highly skilled individuals from the less skilled. Two general positions on expertise exist. Chi (2006) describes one position as "absolute expertise." Proponents of the second position on expertise describe expertise as relative. An absolute expertise paradigm assumes that individual differences in genetics or intelligence distinguish highly skilled individuals from less skilled individuals. The failure of designated experts to maintain their exemplary performance across multiple domains (e.g., Stanley, George, & Solano, 1977; Terman & Oden, 1974) led theorists and researchers to question genetic and intelligence based notions of absolute expertise.

Relative expertise emphasizes the role of domain specific experience. The classic chess study of Adriaan de Groot (1966) represents the shift to relative expertise. In interpreting the findings of this seminal study, De Groot attributed the superior performance of master chess players to an acquired ability to perceive and decode the deep structure among chess pieces into long-term memory.

The idea that long-term memory or knowledge is organized or structured to facilitate efficient retrieval and manipulation pervades modern expertise theory and

research. Prior knowledge and experience is critical to the development of relative experience. For example, prior knowledge of frequently encountered problems is represented by a schema or memory structure for typical problems. A schema can be thought of as memories of frequently experienced problem situations used to interpret instances of related knowledge (Glaser, 1984, p. 100). If relevant information is unavailable, problems solvers fill the schema with information available to them in their long-term memory from more familiar problem situations. In other words, if a problem is of a familiar type it can trigger an appropriate problem schema and lead rapidly to an accurate solution. However, if a problem is of an unfamiliar type, a more general schema is activated that contains general prescriptions for how to proceed. In such cases, the solution will be more time consuming and more difficult to adequately solve.

Relative to sub-experts, relative experts have access to a larger store of memorized and automated knowledge about problems and solutions within their domain (Chi, Glaser, & Farr, 1988; Ericsson & Smith, 1991). Harper, Jentsch, Berry, Lau, Bowers and Salas (2003) refer to these knowledge structures as *structural knowledge*, or an acquired and comprehensive representation of domain specific knowledge. Positive relations between structural knowledge and problem solving (Chi & Glaser, 1985; Gordon & Gill, 1989) substantiate the importance of structural knowledge to expertise.

Metacognition is a second variable frequently implicated in expertise (Paris & Winograd, 1990). The term metacognition first appeared in the work of

developmental psychologist John Flavell. Flavell (1976) used the term metacognition to denote:

“knowledge concerning one’s own cognitive processes and products or anything related to them (...) [and] refers, among other things, to the active monitoring and consequent regulation and orchestration of these processes (...), usually in the service of some concrete goal or objective.” (p. 232)

Skilled individuals across various domains are equipped with a high degree of metacognitive knowledge and are strategic in monitoring and evaluating their learning and performance (Brown, 1987; Gott, Lajoie, & Lesgold, 1991; Mayer, 1999; Schoenfeld, 1987; Smith, Ford & Kozlowski, 1997). Further, Chi (2000) postulated that metacognitive monitoring strategies are responsible for attenuating deficiencies in comprehension and task solution, in turn, allowing learners to amend mental representations of problems and their solution.

Some evidence exists that highly skilled individuals in almost all domains: (a) have devoted much time and effort to their target domain and its relevant tasks (Davis, Curtis, & Tschetter, 2003; Ericsson & Smith, 1991), (b) possess an extensive body of coherently and efficiently organized domain knowledge (Harper, et al., 2003), and (c) select and execute metacognitive strategies to deeply and effectively analyze problems and apply solutions (Brown, 1987; Glaser & Chi, 1988; Sternberg, 1998).

Despite the positive attributes associated with expertise; researchers cite a number of costs. Potential costs associated with expertise include inflexibility, bias, and errors in judgment (Bedard & Chi, 1992; Castel, McCabe, Roediger, & Heitman, 2007; Chi, 2006; Dumont, 1991). Perhaps related, recent research in health related fields suggests that experience is not always associated with highly skilled

performance. The “intermediate effect,” or when sub experts in a given domain outperform relative experts has been identified in several medical expertise studies (e.g., Hobus, Hofstra, Boshuizen & Schmidt, 1989; Remy, et al., 2002).

Therapist Expertise: Structural Knowledge, Metacognition and Self-Reflection

Therapist expertise involves the acquisition of therapy specific knowledge and skills (Rosenberg, 1997 as cited in Skovholt, 1997) and is observed in both cognitive-behavioral (Kingdon, Tyrer, Seivewright, Ferguson, & Murphy, 1996), and psychodynamic (Barber, Crits-Christoph, & Luborsky, 1996) therapies. Hillerbrand (1989) considered an expert therapist as “able to conceptualize clients, integrate factual information into performance, and recognize interpersonal processes” (p. 292). Jennings and Skovholt’s (1999) qualitative study of 10 peer-nominated master therapists identified three broad domains that characterized expert therapists. Jennings and Skovholt labeled domains of therapist expertise as cognitive, emotional, and relational.

Similar to the cognitive sciences, theory (Blocher, 1983) and empirical research in counseling and psychotherapy training (e.g., Kivlighan, 2008; Mayfield, Kardash & Kivlighan, 1999; O’Byrne & Goodyear, 1977) support the notion that highly developed cognitive structures are fundamental to therapist expertise. Blocher (1983) argued that the goal of counselor and therapist training is the “acquisition of new more complex and comprehensive schemas for understanding human interaction (p. 29).” Furthermore, Blocher suggested that optimal counselor performance requires high levels of cognitive functioning. Blocher outlined this cognitive functioning as:

the ability to take multiple perspectives...to differentiate among and manipulate a wide range and large numbers of relevant facts and causal factors...to integrate and synthesize in creative or unusual ways large amounts of information....[to engage] in this quest in active collaboration with the client (Blocher, 1983, p. 28).

Metacognition has garnered increasing attention in the counseling and therapy training literature. Fauth, Gates, Vinca, Boles and Hayes (2007) offered metacognitive processes of pattern recognition and mindfulness as one of the “big ideas in training (p. 385).” Byers-Winston and Fouad (2006) outline the potential utility of metacognitive planning, monitoring, and evaluation in multiculturally competent career counseling.

Self-reflection is a complex sequence of processes and has long been thought to play a significant role in therapist development. Neufeldt, Karno, and Nelson (1996,) defined self-reflection as “a focused inquiry aimed toward attaining a comprehensive and nuanced understanding of phenomena encountered in one’s work (p 3).” Neufeldt et al. derived the following four sequential categories of self-reflection: (a) causal conditions of new information and uncertainty; (b) intervening conditions of personality, cognitive capacity, and the training environment; (c) the search for understanding of phenomena during practice; and (d) long term change in trainee perception and behavior. Skovholt and colleagues (Skovholt & Ronnestad, 1992; Skovholt, Ronnestad & Jennings, 1997) posited that the attainment of therapist expertise requires a minimum of 10 years of reflective practice. Ronnestad and Skovholt (2003) also predict development arrest without reflective practice.

In summary, therapist expertise researchers have made notable progress in conceptualizing the nature of therapist expertise. The current zeitgeist supports the

notion that therapist expertise involves the use of complex cognitive structures containing efficiently stored domain specific knowledge. Implicated in the movement along the therapist expertise continuum are highly developed metacognitive processes of metacognition and self-reflection. Furthermore, the attainment of therapist expertise is thought to require an absolute minimum of 10 years of reflective practice.

Statement of the Problem

Although therapist expertise researchers have identified general knowledge structures and processes that distinguish therapists of different experience levels, few studies examine differences in structural knowledge and metacognitive processes among a sample that meaningfully operationalizes the wide range of therapist experience levels. For these reasons, a number of questions remain regarding the role of structural knowledge and metacognition in differentiating therapists at different levels of therapist expertise. First, assuming that therapist expertise does exist; do therapists at different levels of experience demonstrate reliable differences in structural knowledge? Secondly, although the therapist expertise literature theorizes the importance of metacognitive processes to therapist expertise; it remains unknown whether therapists at different experience levels demonstrate differences in metacognitive processes. Finally, therapist expertise research (Skovholt & Ronnestad, 1992; Skovholt, et al., 1997) suggests that among other variables; a combination of both structural knowledge indicators (e.g., time to complete card sort, number of categories), and metacognitive processes differentiate therapists along the therapist experience continuum. Despite these claims; very little is known about the

specific combination of structural knowledge and metacognitive processes that discriminate therapists of different experience levels. Thus, a third question about the nature is what linear combination of structural knowledge indicators and metacognitive processes best distinguish individuals along the therapist experience continuum?

Rationale for the Study

The expertise paradigm of cognitive psychology provides an abundance of information useful to studying differences across levels of therapist experience. A standard paradigm for studying domain specific expertise differences is protocol analysis. Protocol analysis presents a problem to individuals of varying levels of experience, and subsequently systematically compares their performance (Ericsson & Simon, 1993). Despite existing methods of assessing differences in structural knowledge and metacognitive processes among individuals of different experience, several challenges exist to doing so in the psychotherapy domain.

One challenge to studying structural knowledge differences in therapist of varying experience levels involves choosing a task that is uniformly difficult for therapists at various points along the experience continuum. Structural knowledge can be assessed through the use of two general categories of tasks: *intrinsic* or *contrived* tasks (Chi, 2006). Intrinsic tasks are familiar to what experts do when they are doing their jobs. The use of intrinsic tasks (Chi, Glaser, & Reese, 1982; Feltovich, Johnson, Moller, & Swanson, 1984) typically revealed that relative experts are faster and more error free than relative novices. Alternatively, relative experts find contrived tasks to be less familiar because they depart from tasks experts are

typically asked to perform. Four types of contrived tasks exist: recalling, perceiving, categorizing, and verbal reporting. The use of contrived tasks in expertise research can have several advantages. First, a contrived task can be undertaken just as competently by a novice as an expert. More importantly, a contrived task is less biased toward individuals with greater experience. For these reasons, contrived tasks can be considered more stringent tests of expertise than intrinsic tasks.

A second challenge to meaningfully studying structural knowledge differences in therapist of varying experience levels is the limited availability of empirically supported therapy-specific concepts valued by therapists of various theoretical orientations (Horowitz & Malle, 1993). For example, therapists who identify as primarily cognitive in orientation may prioritize concepts related to “cognitive distortions” and use techniques such as “thought stopping,” and “distraction.” In contrast, Schneider (2003) suggested that a therapist who identifies as existential-humanistic might prioritize concepts related to “therapeutic presence” and rely much more heavily on interpersonal techniques such as “recognition of transference” and “countertransference projections.”

The issue of *differentiation* (Dawes, 1994) is a third challenge to studying differences in structural knowledge among therapists of different experience levels. The use of arbitrary developmental level distinctions exemplifies the differentiation problems of many therapist expertise studies. For example, Skovholt, Ronnestad, and Jennings (1997) cited the use of convenience samples of master’s practicum students at one end of the expertise continuum and Ph.D. interns at the other end of the

continuum. Small differences in years of experience often obscure differences between therapists of varying levels of expertise.

Studying differences in metacognitive processes among therapists of different experience levels is also challenging. First, no therapy specific method of assessing therapist metacognition has been developed. Second, despite the often-cited role of self-reflection to therapist expertise, construct operationalization and measurement issues contribute to the lack of validating data on the relationship between self-reflection and therapist experience level. Most existing measures of self-reflection fail to operationalize adequately the depth and breadth of self-reflection described by Neufeldt, et al. (1996). Two of the most prominent self-reflection measures in psychotherapy research, the Private Self-Consciousness Scale (PrSCS; Fenigstein, Scheier, & Buss, 1975) and the Reflection-Rumination Questionnaire (RRS; Trapnell & Campell, 1999) have been shown to correlate positively with measures of psychopathology (i.e., rumination), and may be measuring a dysfunctional type of self absorption rather than constructive self-reflection (Anderson, Bohon, & Berrigan, 1996). In an attempt to improve on some of the psychometric drawbacks of the PrSCS and the RRS, Grant, Franklin and Langford (2002) devised the Self-reflection and Insight Scale (SRIS) which defines self-reflection as the inspection and evaluation of one's thoughts, feelings, and behaviors. However, validity findings (Grant et al., 2001) indicated that similar to the PrSCS and the RSS, the self-reflection scale of the SRIS may also measure a dysfunctional rumination or self focused style of self-reflection.

In sum, existing challenges to studying structural knowledge differences among therapists of varying levels of expertise includes the decision to choose a contrived versus a familiar task, identification of representative domain specific concepts, and inadequate operationalization of the therapist experience continuum. Challenges to studying the role of metacognitive processes in therapists' expertise include the lack of a therapy specific method of assessing therapist metacognition and questionable validity of existing self-reflection measures.

Purpose of the Study

The present study has several purposes. The first purpose is to assess differences in structural knowledge for therapists at three sufficiently differentiated points along the therapist experience continuum. Ronnestad and Skovholt (2003) identified the following six phases of therapist development: (a) lay helper, (b) beginning student, (c) advanced student, (d) novice professional, (e) experienced professional, and (f) senior professional. The present study operationalizes the therapist experience continuum by sampling lay helpers, advanced students, and senior professional therapists. Lay helpers represent the novice end of the expertise continuum, and have yet to enter graduate level professional training. The advanced student group represents the intermediate point along the experience continuum. Advanced students are often at the conclusion of academic training and are often gaining practicum or internship experience where they receive regular formalized supervision. The senior professional therapist group represents the expert end of the experience continuum. Many senior professional therapists possess 20 years or more of practical experience (Ronnestad et al., 2003).

The Hill and O’Grady (1985) list of therapist intentions will be used in a contrived (sorting) task to assess participants’ structural knowledge. The therapist intentions list was chosen for the present study for three reasons. First, the therapist intentions list has high face validity. According to Hill and O’Grady, the therapist intentions list represents “what therapists want to accomplish through their in session behavior” and refer to the “cognitive component that mediates the choice of intervention” (pg. 3). Secondly, therapist intentions have been found to be highly predictive of actual therapist behaviors. Significant associations between therapist intentions and response modes have been found to exist for therapists of a wide variety of theoretical orientations (Elliott, 1986; Hill & O’Grady, 1985). Finally, the maximum number of entities, which is conveniently manageable for most card sorts, is about 20 (Rugg and McGeorge, 2005). Therefore, the number of intentions (19) represents a manageable number of sorting entities.

The second purpose of this study is to assess for differences in metacognitive processes across the therapist experience continuum. To examine differences in metacognitive processes across therapists of different experience levels, the present study used the Metacognitive Awareness Inventory therapist Form (MAI-TF), a self report measure of metacognition specially developed for the present study and the Self-reflection and Insight Scales (SRIS, Grant et al., 2001).

The continuum of therapist experience level extends from zero to thirty or more years of experience and consists of variability in structural knowledge and metacognitive processes. The final purpose of the present study is to discover what

linear combination of structural knowledge indicators and metacognitive processes differentiate therapists along the experience continuum.

Research Questions

Accordingly, this study addressed the following research questions:

Research Q. 1 Are indicators of structural knowledge significantly different between groups of lay helpers, advanced students, and senior professional therapists?

Research Q. 2 Are metacognition and self-reflection scores significantly different between groups of lay helpers, advanced students, and senior professional therapists?

Research Q. 3 What linear combination of structural knowledge indicators and metacognitive processes discriminate therapists along the experience continuum of lay helper, advanced student, and senior professional therapists?

Significance of the Study

The present study is significant for a number of reasons. The self-regulated nature of the therapy profession and its' significant potential to influence lives upholds the important responsibility to train effective therapists. Results of this study will contribute to the understanding of variation in the cognitive organization of therapist intentions and perceived metacognitive processes among lay helpers, advanced students, and senior professional therapists. These results may have implications for training and supervision activities that promote development of therapy specific knowledge structures and regulatory processes. Results of this study

may also lay the groundwork for future research exploring relations between structural knowledge, metacognitive processes, and other important variables including therapist performance and therapy outcome.

Chapter 2: Literature Review

The purpose of this literature review is to familiarize the reader with important concepts and results of studies related to structural knowledge, metacognition, and self-reflection. The literature on structural knowledge assessment is the first area reviewed and emphasizes review of the card sorting method of structural knowledge assessment. The role of problem structure and expertise development in the domains of physics and medical education, and counseling and psychotherapy are also reviewed. The second area of literature covers major trends in the conceptualization of metacognition and includes a section describing the development and validation of the Metacognitive Awareness Inventory (MAI, Schraw & Dennison, 1994). This section also integrates theoretical literature related to metacognition and therapeutic competence. The third area of literature reviewed will be theory and research on counselor and therapist development. Three models of counselor and therapist development will be reviewed with an emphasis on the role of self-reflection in counselor and therapist expertise development.

Structural Knowledge

Review of the cognitive science literature is replete with overlapping definitions for structural knowledge. Structural knowledge has been defined in many ways in the literature. Shavelson (1972) referred to structural knowledge as “the organization of long-term memory concepts (pp. 226-227).” Functional definitions characterize structural knowledge as a type of knowledge that facilitates the translation of relevant domain knowledge into procedural knowledge (Jonassen, Beissner, & Yacci, 1993). Similarly, Gagné (1985) defined structural knowledge as

interrelated representations of declarative knowledge that facilitate procedures. The most discernible definition is that structural knowledge is the way individuals organize important concepts, rules, and procedures that characterize a domain of practice (Davis, Curtis, & Tschetter, 2003; Kraiger, Ford, & Salas, 1993; Naveh-Benjamin, et al., 1986).

Structural Knowledge Assessment

A key premise of structural knowledge assessment is that knowledge is relational (Davis & Yi, 2004). Accordingly, structural assessment involves: (a) obtaining judgments of the relationship between concepts; (b) defining some representation or cognitive structure based on these judgments; and (c) evaluating the derived knowledge structure by comparing it against a referent structure (Goldsmith & Kraiger, 1997).

Various methods exist to assess structural knowledge. Harper et al. (2003) term these methods as structural knowledge elicitation techniques. Frequently used knowledge elicitation techniques include similarity ratings, relationship judgments, free recall, and card sorting. Each of these methods requires individuals to make judgments of the similarities among domain specific concepts. The next section will review literature on the reliability and validity of the card sort method of structural knowledge assessment.

Card sorting

Card sorting techniques are aligned with Kelly's (1955) personal construct theory and assumes that people can describe their own categorization of the world with reasonable validity and reliability (Rugg & McGeorge, 2005). Empirical

research has validated the use of card sorts to assess structural knowledge. Tessmer, Perrin, and Bennett (1998) studied the reliability of card sorts and concluded that card sorts produce stable and coherent measures of structural knowledge. Evans, Hitt, and Jentsch (2001) obtained results of moderate to high test-re-test reliabilities ($r = .50$) of repeated card sorts, implying that participant's knowledge structure is similar each time the assessment is repeated. Fiore, Fowlkes, Martin-Milham, and Oser (2000) assessed the construct validity of card sorting by comparing it with similarity ratings using Pathfinder methodology (Schvaneveldt, 1990) and found that both techniques are comparable when used to assess expert aviator's knowledge structures. Cheatham and Lane (2002) found that card sorts are an efficient way of capturing structural information and may be a better predictor of performance than other knowledge elicitation tasks measured in their study.

Card sorts yield a variety of reliable quantitative indices useful in assessing structural knowledge differences (Deibel & Anderson, 2005; McGeorge & Rugg, 1992) and have been widely used to assessing experience based performance differences in children and adults (e.g., Chi, Glaser, & Reese, 1982; Gobbo et al., 1986; McCauley, et al., 2005; Van de Wiel, Boshuizen, Schmidt, & Schaper, 1999).

Problem Structure and Structural Knowledge Assessment in Physics and Medical Education

The present section examines research in physics and medical education literature to highlight the impact of problem structure on structural knowledge assessment in the domains of physics and medical education.

Chi, Glaser, and Reese (1982) conducted two studies in order to assess problem categorization differences by level of expertise. The first study required physics Ph.D. students (relative experts) and undergraduate students who have taken one mechanics course (relative novices) to categorize physics problems based on similarity of problem solution. Due to their greater years of experience and use of concepts (physics problems) assumed to be familiar; the authors hypothesized that Ph.D. students compared to undergraduate students would demonstrate better structural knowledge as evidenced by fewer problem categories and increased efficiency in categorizing problems. No significant differences were found in the number of problem categories produced by each group or amount of time taken to categorize problems. Although no quantitative experience level differences were found between the two participant groups; examination of two pairs of problems the majority of participants at both experience levels categorized together found differences in verbal justifications of the two categories. Ph.D. student's verbal justifications implicated the use of deep level features, but justifications given by undergraduate students implicated surface level features. For example, Chi et al. (1982, pp 125) found that Ph.D. student's justifications implicated physics laws such as conservation of energy and Newton's law of physics while undergraduate student's justifications implicated simple concepts such as "rotational things," "blocks," and "inclines planes."

Contrary to the author's hypothesis, quantitative differences were not found in the number of categories generated and time to complete the categorization. The patterns of findings in this study may be due to inadequate operationalization of the

expertise continuum. It is unlikely that Ph.D. students represent the expert end of the physics expertise continuum. Furthermore, findings from this study underscore the importance of examining descriptive features of structural knowledge data in addition to quantitative indicators of structural knowledge.

Chi et al. (1981) attempted to replicate the finding that physics Ph.D. students would categorize physics problems based on deep structured (e.g., physics principles), but novices would categorize physics problems based on surface structure (e.g., objects or key words described in the problem). To better differentiate the physics developmental continuum, Chi et al. hypothesized that categorizations made by advanced novice students would combine deep and surface features of physics problems. The research hypotheses were confirmed. Novices categorized physics problems based on key physics words within the problem set, and Ph.D. students categorized problems based on underlying physics principles. As hypothesized, advanced novice students categorized problems using a mix of surface and deep structure. Advanced novices categorized problems by underlying physics principles while simultaneously separating them according to surface features of the problems. The authors interpreted these findings to mean that with learning; there is a gradual shift in organization of knowledge from one centering on surface level components of the problem to one where there is a combined reliance on surface and deep level components of physics problems. These results imply a positive relationship between higher experience level and more well developed structural knowledge.

Medical expertise development has been conceptualized by structural changes in students' knowledge base; a process termed *knowledge encapsulation* (Schmidt,

Norman, & Boshuizen, 1990; Schmidt & Boshuizen, 1993). Schmidt et al.'s (1993) model of expertise development suggests that learner's progress through a series of three phases characterized by functionally different knowledge structures. The first phase is characterized by the accumulation of basic knowledge of medical illnesses that explain the causes and consequences of disease in terms of basic pathophysiological processes. At the second stage, through experience with actual cases; declarative knowledge accumulated in the first stage becomes compiled into higher-level causal models explaining signs and symptoms, which are subsumed under diagnostic labels. In other words, knowledge is reorganized into narrative structures called *illness scripts* (Schmidt et al., 1993).

Illness scripts contain information including: “enabling conditions” or factors making occurrence of a disease more likely (e.g., risk factors), “predisposing factors” (e.g., family history), “boundary conditions” (e.g., age, sex), “faults” (e.g., description of the malfunction), and “consequences” (e.g., signs and symptoms arising from the fault). Illness scripts, because they develop through experience are thought to be highly idiosyncratic in nature (Schmidt et al., 1993). Expert physician clinical reasoning is based to a large extent on the similarity between the presenting situation and some previous illness script available from memory (Schmidt et al., 1993). In the final stage, memory for previous patient encounters is retained as individual entities as expert physicians begin to store patient encounters as “instance scripts.”

Knowledge encapsulation has been the topic of several research studies. Van de Wiel, et al. (1999) asked experienced physicians, advanced students, and medical clerks to explain 20 clinical constructs in terms of underlying patho-physiology.

Resulting protocols of experienced medical doctors contained more elaborate and fluent explanations than those of clerks and medical students. These results imply that experts apply densely integrated encapsulated knowledge while sub experts apply detailed and procedural knowledge. There is also evidence to suggest that experts and novices differ in their use of biomedical versus encapsulated knowledge in making a diagnosis. Schmidt, Hobus, Patel, and Boshuizen (1987) investigated the role of enabling conditions of a clinical case (age, previous illness, and family history) in diagnostic skill among novice and expert family practitioners. The authors found that expert family practitioners compared to novice family practitioners showed superior diagnostic skills when presented with slides containing a picture of the patient and information about the patient's profession, previous diseases, medication, and marital status compared to when they were presented with the patient's complaint alone (38% vs. 27%).

Problem structure is an important determinant of medical expertise (Chi & Glaser, 1985; Gagne, Yekovitch & Yekovitch, 1993). Highlighting the impact of problem structure on medical expertise, Hobus, Hofstra, Boshuizen, and Schmidt (1989) discovered that when information about enabling conditions was not presented to experienced physicians; their diagnostic performance was no better than that of novice physicians. These findings suggest that the performance of individuals with greater experience is compromised with structural knowledge assessment involving contrived tasks. Experienced physicians rely on enabling conditions of case information in order to activate relevant problem solving schemas or illness scripts. Without these enabling conditions, experienced physicians' performance was not

significantly better than physicians with little experience. (Remy, et al., 2002) asked experts from two disciplines (cardiologists and pulmonologists) to diagnose, recall, and explain the signs and symptoms of four clinical cases: two cases were in the domain of cardiology and two were in the pulmonology discipline. Therefore, cardiologists and pulmonologists fulfilled both the relative expert and relative novice roles. Cardiologists and pulmonologists alike were faster and more accurate diagnosing cases within their specialties. Findings were explained by familiarity of the clinical cases. When processing a case outside of one's domain; participants were limited in their ability to use encapsulated knowledge and thus used more time to diagnose the problems, albeit with less accuracy than relative experts.

Structural Knowledge Assessment in Counseling and Psychotherapy

Historically, a major challenge for counseling and psychotherapy training researchers is the identification of cognitive developmental variables that explain differences found between skilled and less skilled therapists. Furthermore; problem structure, or the degree of definition (ill-defined versus well-defined) is an important factor to consider when interpreting structural knowledge assessment results (Chi & Glaser, 1985; Gagne, et al., 1993). The present section will review and critique studies on counselor and therapist's structural knowledge assessment relative to problem structure.

Martin, Martin, Mayer, and Slemon (1986) employed a stimulus recall method to examine relations among counselor and client cognitions, behaviors, and ratings of session quality in 29 counseling sessions involving 10 different counselor-client dyads. Stimulated recall instructions asked counselors and clients to recall what they

were thinking during eight instances of counselor behavior. Stimulated recall results indicated that novice counselors rated themselves as working harder than did experienced counselors; a finding that may indicate experienced counselor's acquisition of more automatic, and less effortful modes of information processing and problem solution. These findings are consistent with the expertise literature which suggests that relative experts are quicker and expend less effort during task solution, particularly when asked to solve familiar tasks.

Hillerbrand and Claiborn (1990) studied differences in cognitive processes used by counselors of varying experience levels during diagnostic decisions. Doctoral level professionals with over five years of professional experience were designated as experts. Novices were graduate students in Counseling Psychology with between one and three semesters of clinical experience and one course in diagnostic assessment.

Participants were given three different psychological cases. The cases differed in degree of structure from "well-structured," "ill-structured," and "random-structured." The well-structured case contained information that was clearly and specifically related to a diagnosis of antisocial personality disorder. This case did not include any information that related to other Axis 1 or Axis 2 disorders. The ill-structured case included some clear information related to a diagnosis of depression but also included contradictory and diagnostically irrelevant information. The random-structured case was made up of randomly selected symptoms from the Diagnostic and Statistical Manual of Mental Disorders-III (DSM-III). Participants were asked to provide a diagnosis for the case. Hillerbrand and Claiborn (1990)

hypothesized that relative experts would perform better than relative novices when forming responses to the well-structured case but would perform no better with the ill-structured and random-structured cases.

Results showed that experts were more accurate in making diagnoses for the case in which diagnostic information was considered well structured while novices had more difficulty assigning an accurate diagnosis (Hillerbrand & Claiborn 1990). As was hypothesized, experts were no more accurate than novices in forming diagnoses for the ill-structured and random-structured cases. The researchers concluded that experts generated more accurate diagnoses for the well structured case because they were able to access information previously stored in their “diagnostic schema” to make sense of well-organized diagnostic-related information. However, as case information became less clear, experts’ ability to make diagnostic decisions was no better than novices (Hillerbrand & Claiborn, 1990).

Martin, Slemon, Hiebert, Hallberg, and Cummings (1989) used a cognitive mapping technique (CMT) to study the effect of experience level on case conceptualizations using two conditions. In the first condition, participants made conceptual associations in response to the stimulus sentence: “Generally speaking, what happens to help clients change during counseling?” In the second condition, participants made conceptual associations concerning “specific” problems of individual clients in reference to the stimulus sentence: “What are the most important things to consider with respect to the client’s problems?” The first condition is considered to be ill structured as the problem structure in the second condition specifies a specific initial state (e.g., specific client information). The specific

problem condition also appears more structured as it identifies the specific constraint: “what should be considered with respect to the client’s problems?” In contrast, the general probe condition does not provide information about an initial or a desired state and is absent of any specific constraints.

Participant’s cognitive maps were scored for extent (number of concepts generated), conceptual integration (average number of links per concept), and degree of hierarchical organization (number of super-ordinate clusters). Multiple analysis of variance (MANOVA) revealed no main effects for years of experience or stimulus probe type. However, a statistically reliable two way (counselor experience x stimulus probe type) interaction effect was found on scores for the number of concepts measured $F(1, 35) = 6.69, p = .01$. Mean scores for conceptualizing general counseling process were 8.30 and 8.54 for novice and experienced counselors, respectively. However, mean scores for conceptualizing the counseling process with a specific client problem was 9.11 for novice counselors and 7.96 for experienced counselors. Martin et al. (1989) interpreted this result as consistent with previous findings that the greater number of concepts produced by the novice counselors for the specific client problem indicated that they had yet to develop highly refined, domain-specific schemas to use for describing client specific issues. By contrast, experienced counselors used fewer concepts in the specific client condition because they possessed the schemas necessary for parsimoniously characterizing the client. These results underscore the impact of problem structure on counselor and therapist structural knowledge assessment.

To study differences between experienced counselors and novice counselors knowledge structures about clients, Mayfield, Kardash and Kivlighan (1999) attempted to control for some of the methodological limitations of the Martin et al. (1989) study by having both experienced and novice counselors read the same transcript of an initial counseling session. Participants sorted a set of cards each containing a single statement from the transcript into piles. After the sort; participants labeled each pile as well as the relationships among cards in each pile. Participant data were analyzed with respect to experience level differences in the amount of time spent on the CMT, the number of concepts generated, and the structural quality of cognitive maps.

Mann Whitney U tests revealed that experienced counselors were significantly faster at reading the transcript and sorting transcript statements. No significant differences were found to exist between experienced and novice counselors in the time spent making the cognitive map. Consistent with the finding from the Martin et al. (1989) study; cluster analysis indicated that novices (a) constructed simplistic representations containing few reciprocal links between categories, (b) had more concept categories and (c) formed categories based on surface features. These results support the information-processing perspective that novices attend more to surface detail and require greater time to process information; which is indicative of relatively inferior structural knowledge.

O'Byrne and Goodyear (1997) examined the amount and type of information expert and novice psychologists sought to form a clinical impression of a vignette of a hypothetical client that has come for her first visit to a university counseling center.

Novices were graduate students in psychology who reported a mean of 1.8 years professional experience; experienced therapists were peer-nominated counseling center psychologists with a mean of 13 years experience. Results suggested that experience level may affect both the amount and type of information sought by participants. On average, counseling center psychologists requested significantly more information compared to graduate students (23.1 vs. 14.9 questions).

Counseling center psychologists were found to focus less on crisis aspects of the client situation (56.5 vs. 64.4%). This finding is consistent with expertise research in that experienced professionals are believed to examine a greater number of hypotheses compared to less experienced practitioners. That is; if experts have more numerous schemata against which to compare client information, they are likely to require more information about the client to determine the "goodness-of-fit" with existing cognitive structures. Specifically, ill structured problems tend to require more experienced participants to use more time and result in greater categories. In contrast, better defined problems tend to result in experienced participants arriving to solutions more quickly and with the use of fewer categories.

Researchers have also examined qualitative features of therapist structural knowledge. Hill and O'Grady (1985) sampled 42 experienced therapists with an average of 10 years of post internship experience to examine the structural configuration of therapist intentions within and across therapy sessions. MDS analysis uncovered a two dimensional solution that accounted for 83% of the variance. The first dimension reflected Support-Assessment versus Change, the second dimension reflected Therapeutic Problems versus Therapeutic Work. Further

examination of the MDS solution by Hill and O'Grady indicated that "insight" and "feelings" were often used together, tapping what these authors referred to as "emotional insight" (p. 16). Therapist intentions were found to vary similarly within and across sessions (Hill & O'Grady, 1985). Specifically, intentions of "set limits," "get information," "support," "clarify," "hope," and "cathart," decreased with time while "insight," "change," and "reinforce change" increased with time.

Kivlighan (2008) examined trainees' pattern of intention use and changes in structural knowledge of intentions as a result of academic training. Furthermore, the authors assessed the degree to which trainee's pattern of intention use and structural knowledge of intentions converge with that of experienced therapists and relate to client rated outcome (smoothness and depth). Results found that only trainee's procedural structural knowledge changed from pre-training to post-training, becoming more similar to the structure of intentions use of the experienced therapists. When trainees' structure of intention use was more similar to that of experienced counselors, their clients rated counseling sessions as smoother at both pre- and post-training and deeper at post-training only.

Examination of participant's semantic networks found notable differences when comparing trainee's semantic networks to that of experienced therapists. Intentions of "feelings," "insight," and "clarify" were central in both novice and experienced organization of intentions use. For experienced counselors, the relatively high use of these intentions was in conjunction with other intentions. For novices, the high use of these same intentions was in isolation from other intentions. Kivlighan

(2008) concluded that experienced counselors used the feelings, insight, and clarify intentions along with other intentions to further the counseling process.

Metacognition

Metacognition is one of the most actively investigated cognitive processes in contemporary developmental and instructional psychology research (Tobias & Everson, 2000). The empirical study of metacognition can be traced to two domains: reading comprehension (Alexander & Jetton, 2000; Guthrie & Wigfield, 1999; Pressley & Afflerbach, 1995) and academic problem solving (Baker & Brown, 1984). The current section examines two models of metacognition: Flavell's (1979) model of cognitive monitoring and Baker and Brown's (1984) metacognitive model.

Models of Metacognition

Flavell's (1979) model of cognitive monitoring describes the interactions among four metacognitive components: (a) metacognitive knowledge, (b) metacognitive experiences, (c) cognitive strategies and (d) cognitive goals. Figure 1 depicts the components of metacognition and the relations between them as stated by Flavell.

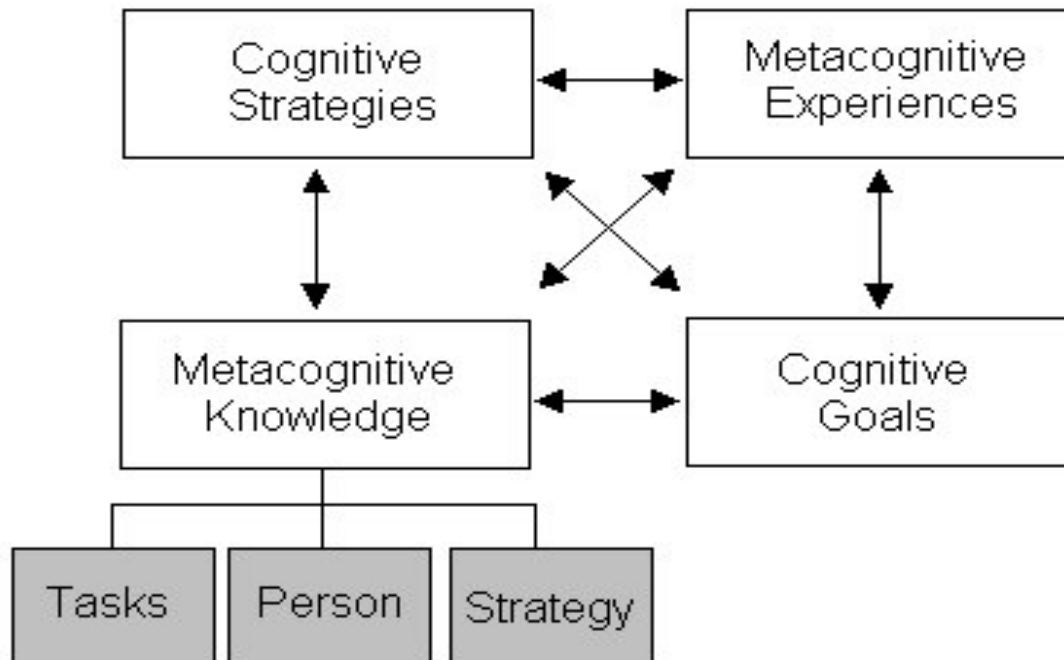


Figure 1. Flavell (1979) Model of Cognitive Monitoring

Metacognitive knowledge consists of knowledge about three categories and their interaction: (a) the person category, (b) the task category, and (c) the strategy category. The person category consists of beliefs about the nature of self as a cognitive processor (e.g., the realization that one is better at mathematical calculations than at memorizing historical events). The tasks category considers the information available to solve the problem as well as information about demands of the specific cognitive tasks. In this category, one would find understanding of the implications of the way information is presented. The strategy category consists of knowledge about which strategies are likely to be effective for achieving task goals.

Metacognitive experiences function to monitor strategic task related decision making cognitive processing as they take place (Flavell, 1979). Feelings of familiarity, difficulty, and confidence are some examples of metacognitive

experiences that contribute to the use of metacognitive strategies (Efklides & Petkaki, 2005). Flavell concluded that metacognitive experiences are more likely to happen in situations that demand careful and highly conscious reflective thinking, planning, or where decisions and actions are weighty, risky, and not predetermined. *Cognitive strategies* refer to the utilization of specific techniques that assist in achieving cognitive goals. *Cognitive goals* describe the chosen path one chooses to manage the task.

Metacognitive knowledge and monitoring and control processes follow different developmental trajectories. The available empirical data (Flavell, 1985 cited in Garner & Alexander, 1989; Kreutzer, Leonard & Flavell, 1975) suggests that metacognitive knowledge develops incrementally as a function of time. In some domains, a high degree of metacognitive monitoring is difficult for adults to sustain (Markman, 1981; Glenberg, Wilkinson & Epstein, 1982).

Brown (1987) described metacognition as an awareness of one's own cognitive activity; the methods employed to regulate one's own cognitive processes; and a command of how one directs, plans, and monitors cognitive activity. Baker and Brown's (1984) model of metacognition divides metacognition into two broad distinguishable yet closely related categories: *Knowledge of Cognition* and *Regulation of Cognition*. For example, knowledge of cognition is thought to be stable and age dependent, while regulation of cognition is thought to be less stable and age independent (see Figure 2).

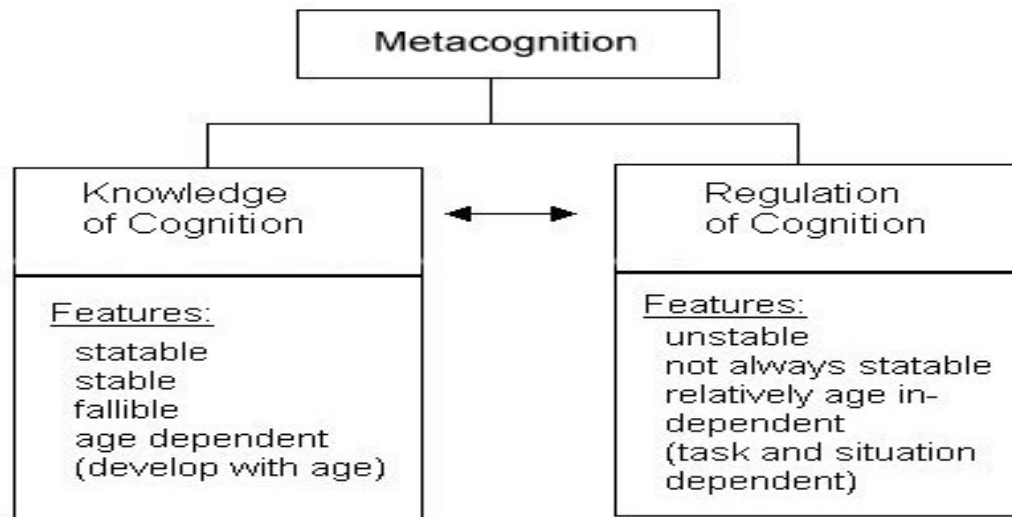


Figure 2. Baker and Brown's (1984) Model of Metacognition.

Knowledge of cognition refers to what individuals know about their own cognition and includes three different kinds of metacognitive knowledge: (a) declarative, (b) procedural, and (c) conditional (Brown, 1987; Jacobs & Paris, 1987; Schraw & Moshman, 1995). *Declarative knowledge* refers to knowing “about” things and includes knowledge about oneself as a learner and about the factors that influence learning. *Procedural knowledge* refers to knowledge about the execution of procedural skills. Pressley, Borkowski, and Schneider (1987) suggested that individuals with high procedural skills are more likely to sequence problem-solving strategies effectively. Chi et al. (1989) suggested that individuals with high procedural skills use qualitatively different strategies to solve problems. *Conditional knowledge* refers to knowing the “why” and “when” aspects of cognition and can be thought of as the declarative knowledge about the relative utility of cognitive procedures. Schraw and Dennison (1994) suggested that knowledge of cognition allows individuals to plan, sequence, and monitor their learning in a way that directly

improves performance. Regulation of cognition is thought to refer to processes or mechanisms that help control and monitor thinking, performance, and subsequent learning.

Brown (1987) specifically delineated four components of metacognition: (1) planning, (2) monitoring, (3) evaluating, and (4) revising. Metacognitive planning refers to the deliberate activities that organize the entire learning process and consist of establishing the learning goal, learning sequence, learning strategies, and expected learning time. Examples include, making predictions, strategy sequencing, and allocating time and attention selectively before beginning a task. Secondly, metacognitive monitoring refers to the activities that moderate the current progress of learning. An example of metacognitive monitoring involves periodic self-testing. Research indicates that monitoring ability occurs quite slowly and is quite poor in adults (Schraw, Dunkle, Bendixen & Roedel, 1995). Metacognitive evaluation refers to appraising the products and regulatory processes of learning, thinking, and performance. Metacognitive revising involves modifying previous learning approaches, goals, and task related strategies. Baker and Brown's (1984) model of metacognition is particularly suitable for research purposes because it enables a focus on specific components of knowledge and regulation of cognition relevant for problem solving.

Metacognition research indicates that the more metacognitive one is; the more strategic and successful one is likely to be in cognitive tasks (Garner & Alexander, 1989; Pressley et al., 1987). Pressley et al. (1987) argued that compared to poor learners, good learners have: a larger repertoire of strategies, are more flexible in

their approaches to problems, have a larger database of knowledge concerning the circumstances that make different strategies appropriate, and do more strategic monitoring and regulation of strategy use to ensure that activities are carried out in the appropriate sequence. Davidsson, Mitchell, Mitchell and Smith (2006) investigated how entrepreneurial metacognition impacts entrepreneurial expertise. The authors sampled two groups. The treatment group consisted of 233 masters and undergraduate students in a four-month entrepreneurship program who were exposed to a metacognitively-based curriculum. The control group consisted of 67 business students enrolled in an entrepreneurship course that did not consist of metacognitive elements. The expertise of students receiving the metacognitive treatment increased at a significantly higher rate than the students not receiving the treatment.

Metacognition may be particularly sensitive to the Dunning-Kruger Effect (Kruger & Dunning, 1999), a cognitive bias in which the less skilled rate their own ability as much higher than it actually is, while the highly skilled underrate their abilities. The Dunning-Kruger effect is interpreted as a lack of metacognitive ability to recognize one's incompetence. Students, particularly those in the lowest first and second quartiles of actual performance have been found to overestimate their mastery of material and test performance, (Dunning, Johnson, Ehrlinger, & Kruger, 2003).

Measuring Metacognition

One of the most difficult problems facing researchers interested in metacognition is identifying metacognitively aware individuals quickly and reliably (Schraw & Dennison, 1994). Several issues pertain to the difficulty of assessing metacognition. First, metacognition has been defined in a number of different ways.

Secondly, the concept pertains to internal cognitive processes that are difficult to observe, and often out of conscious awareness. For these reasons, few psychometrically viable methods of assessing metacognition exist. Existing assessment methods can be prohibitive in most applied settings due to the amount of time and effort necessary for administration. For example, Swanson's (1990) method of assessing metacognition asks individuals to respond individually to a series of 17 open-ended questions intended to assess metacognitive knowledge. Although reliable, Swanson's method places excessive demands on researchers and their participants. The next section will review the initial development and validation of a domain general metacognition inventory, the Metacognitive Awareness Inventory (MAI, Schraw & Dennison, 1994).

The MAI was initially divided into eight theoretical components; three of which assess knowledge of cognition (declarative, procedural, and conditional) and five of which assess regulation of cognition (planning, monitoring, evaluation of learning, information management strategies, and debugging strategies). Knowledge of cognition measures knowledge of one's strengths and weaknesses about strategies and when and why certain strategies should be used. Regulation of cognition measures knowledge about planning, implementing, monitoring, and evaluating strategy use.

Schraw and Dennison (1994) conducted two experiments to develop and test the reliability and validity of the MAI. In the first study an unrestricted factor analyses orthogonal (uncorrelated) and oblique (correlated) was initially performed to assess the match between the eight hypothesized subscales and observed factors.

Both analyses produced six factor solutions with Eigen values greater than one that recovered 78% of the sample variance. Factor loadings for each solution were almost identical, however the oblique solution indicated that each pair of factors was correlated in excess of $r = .30$.

Inspection of the oblique and orthogonal six factor solutions revealed that neither corresponded to the eight hypothesized subscales described above. The first two factors included most of the knowledge of cognition items. Factor three through six included most of the regulation of cognition items. Six items had loadings less than .45 on both factors. Three items failed to load on either factor. In addition, coefficient alphas for five of the six factors were below desired criterion of .80 (e.g., .81, .74, .71, .66, .65, & .59 respectively). Overall, the unrestricted factor solutions did not lead to a highly reliable eight-factor solution.

Schraw and Dennison (1994) conducted a forced two-factor solution to compare whether the two factors corresponded to the knowledge of and regulation of cognition factors. Factor loadings for the restricted (two factor) solutions (oblique and orthogonal) resulted in virtually identical solutions. Seventeen items loaded unambiguously on the first factor. 35 items loaded on the second factor. The two factors accounted for 65% of the sample variance. The internal consistency of these two factors ranged from .93 to .88. As expected, items included in the knowledge of cognition category (declarative, procedural, and conditional knowledge) loaded on the first factor and items included in the regulation of cognition category (planning, information management strategies, monitoring, debugging strategies, evaluation) loaded on the second factor. The two factor solutions were highly correlated in both

solutions ($r = .54$ and $.45$, respectively). This finding is consistent with previous theoretical accounts of metacognition (Baker et al., 1984; Brown, 1987). Although the magnitude of these correlations indicates that knowledge and regulation of cognition are related, the authors found little evidence that they share a compensatory relationship.

Schraw and Dennison (1994) tested the relationship between pre-test performance judgments and the MAI by partitioning three groups based on pre-test judgments. Pre-test judgments were used as a measure of metacognitive knowledge of monitoring skills. The authors predicted that judgments of high monitoring accuracy would be associated with higher scores on the MAI's knowledge of cognition factor. A MANOVA using knowledge of and regulation of cognition scores as dependent variables did not reach significance. However, several one way analysis-of-variance (ANOVA) revealed that knowledge of cognition scores differed significantly across the three groups, whereas regulation of cognition did not. A comparison of individual means using Tukey's HSD procedure revealed that the highest performing group in terms of accuracy of pre-test judgments (Group 3) reported significantly higher knowledge of cognition scores than either Group 2 or group 1.

Hammann and Stevens (1998) investigated the usefulness of the MAI in assessing metacognition and self regulation among 90 introductory educational psychology students. *Knowledge of Cognition* was found to correlate positively with several scales of the Motivated Strategies for Learning Questionnaire (MSLQ, Pintrich, Smith, Garcia, & McKeachie, 1993), including self efficacy for learning and

performance (.502), metacognitive self regulation (.393), and negatively with test anxiety (-.408). *Regulation of Cognition* correlated positively with all four of the cognitive and metacognitive strategies as well as metacognitive self-regulation (.72).

Sperling, Howard, Saley and Dubois (2004) found that regulation of cognition was significantly associated with control of learning beliefs and self-efficacy for learning and performance, while *Knowledge of Cognition* had no association with these motivational variables. These studies suggest that knowledge of cognition and *Regulation of Cognition* as measured by the MAI relate positively to undergraduate educational psychology student's self regulation and classroom performance measures.

Metacognition, Counseling, and Psychotherapy

Theoretical and empirical literature exists to support the importance of metacognitive strategies to skilled counseling and therapy. Williams, Judge, Hill, and Hoffman's (1997) qualitative study of therapist's information management strategies found that novice therapists used three primary strategies: focusing on the client, the use of self-awareness to gain a better understanding of the client, and suppressing their own feelings and reactions. Morrow and Deidan (1992) encouraged counselors to engage in metacognition by asking themselves a series of confirming and disconfirming questions about working hypotheses while remaining open to data that contradicts working hypotheses. Furthermore, Ridley (1995) urged counselors to evaluate the effectiveness of interventions regarding their helpfulness.

Byers-Winston and Fouad (2006) encouraged the importance of metacognition in developing multicultural counseling competence among career

counselors. Their metacognitive model of multiculturally career counseling advocates for the development of cognitive awareness of their cultural context and how their own thinking and perceptions influence the way client's cultural context is viewed. In their model, planning involves developing a plan of action or an awareness of what his or her initial goals are for working with the client. Monitoring involves accurate identification of the impact of the therapist and client's cultural values and their impact on goal setting. Monitoring involves awareness to specific aspect(s) of client information therapists are attending and what that reflects about the therapists own cultural values and worldviews.

Fauth, et al. (2007) proclaimed metacognitive strategies as the future in psychotherapy training. These authors suggest that psychotherapy training focus on targeting therapists' metacognitive skills of pattern recognition and mindfulness via experiential practice. These authors suggested that pattern recognition training of "important, yet just notable differences in client's in-session behavior" (p. 386) can guide explicit therapeutic attention to these areas. Training in metacognitive mindfulness may also assist trainees in observing their own as well as client's thoughts, feelings, and behaviors without judgment. As a result, metacognitive mindfulness might enhance therapists' skills around non-judgmental listening and accurate empathy. Despite these theoretical suppositions little is known about metacognitive differences among therapists of varying levels of experience.

Models of Counselor and Therapist Expertise Development

Most counseling and therapy expertise models assume that shifts in cognition, motivation, and strategic processing, such as self-reflection, underlie the

developmental process toward therapist expertise. The present section examines three models of counselor and therapist development with the purpose of highlighting the role of cognitive development and self-reflection in therapist professional development. These models include Loganbill, Hardy, and Delworth's (1982) conceptual model, Stoltenberg's (1998) Integrative Developmental Model and Skovholt and Ronnestad (1992) phase model of professional development.

Loganbill, Hardy, and Delworth (1982) addressed the importance of cognitive development in their model of therapist development. The stages include (a) a stagnation period; when the trainee is relatively stable but not growing, (b) a period of confusion; when the trainee has become aware of an issue but has not resolved it, and (c) a period of integration, when the trainee has developed a new way of addressing the issue. Of the eight critical issues in training (e.g., competence, emotional awareness, autonomy, identity, respect for individual differences, purpose and direction, personal motivation, and professional ethics); two relate to the cognitive domain of professional development: purpose and direction, and respect for individual differences. According to Loganbill et al. issues of purpose and direction involve development of a cognitive map of how counseling can meet a wide array of clients' goals. Cognitive development also relates to the issue of respect for individual difference, for example, recognizing and integrating qualities of an individual that are strengths and those that are weaknesses.

The Integrated Developmental Model (IDM, Stoltenberg et al., 1998) characterizes therapist developmental changes on three overriding structures: (a) self-other awareness, (b) motivation, and (c) autonomy. At Level 1, trainees are highly

motivated, dependent upon the supervisor, and have limited self-other awareness. Self-other awareness relies upon metacognitive aspects of the self. At Level 2, the trainee motivation fluctuates, and he or she experiences conflicts with dependency and autonomy, and focuses more on the client. At Level 3, trainee's motivation is stable; there is a firm belief in one's own autonomy, and knowledge and acceptance of one's own therapeutic strengths and weaknesses.

Skovholt and Ronnestad's (1992) stage model of therapist expertise development is based on a cross sectional qualitative study of a 100 therapists and counselors ranging from first year graduate students to seasoned professionals with 40 years of experience beyond graduate school. Skovholt and Ronnestad's study includes six general phases of therapist professional development: (a) Lay Helper, (b) Beginning Student, (c) Advanced Student, (d) Novice Professional, (e) Experienced Professional, and (f) Senior Professional.

During the "Lay-Helper" phase of development, common sense and experiential learning are predominant forms of learning. As individuals progress through the course of the lay helper phase, they begin to utilize cognitive processing to learn conceptual ideas and techniques. Information is assimilated from many sources in a general manner that is accompanied by a sense of uncertainty. During the "Beginning Student" phase, students depend heavily on multiple sources of information for learning. At this stage, students demonstrate an increased urgency in learning conceptual ideas and techniques. Skovholt and Ronnestad (1992) suggested that anxiety can create obstacles for students cognitive processing of therapy related information.

The central developmental task at the “Advanced Student” phase is to function at a basic professional level. During this phase, advanced students make a transition from “rigid use of basic conceptual ideas and techniques to a refined mastery of conceptual ideas and techniques.” According to Skovholt and Ronnestad (1992), the advanced student is critically assessing and evaluating theoretical models by engaging in the process of “differentiating, accepting, or rejecting model components.”

A sense of being on one’s own exemplifies the “Novice Professional” phase. There is a continual process of “shedding and adding” at the conceptual and behavioral level (Skovholt & Ronnestad, 1992). A central developmental task for most experienced professionals is to create an identity, which is highly congruent with their self-perceptions (values, interests, and attitudes). Theoretical based concepts serve an important yet secondary function in the sense that they are accepted or rejected depending on the degree to which they assist meaningful interpretation of clinical experiences.

During the final “Senior Professional” phase; the therapist now demonstrates continual self-reflection, personal rejection of some earlier mastered conceptual ideas, and modification of their externally imposed professional style. Toward the middle and end of this continuum, personally chosen and individualized conceptual ideas and techniques contribute to increased authenticity within competent professional boundaries (Skovholt & Ronnestad, 1992).

Particularly relevant to the purposes of the present study are themes three and four of Skovholt and Ronnestad’s (1992) phase model. Theme three suggests that

continual self-reflection “constitutes the central developmental processes,” but, experiential learning is the primary developmental process for lay helpers. Theme four suggests that beginning practitioners depend on “external expertise,” whereas senior practitioners rely on “internal expertise.” Similar to illness scripts described in the medical education literature, internal expertise results from many years of accumulated clinical experience and as a result may be much more idiosyncratic relative to external expertise.

The counseling and therapy training literature convey a similar preference in the advanced trainee for an internal focus. O’Byrne and Goodyear (1997) clarified the important effect that reflection had in the development of therapist expertise. O’Byrne and Goodyear determined that as trainees applied theoretical information to each unique client in the context of the therapeutic process; they developed the ability to apply useful parts of what they had learned, and developed a deeper understanding of what was effective and what was not. Ultimately O’Byrne and Goodyear found that as trainees looked more closely and reflected on the unique features of the client, they “learn, unlearn and relearn how to see the counseling process and their role in it (p. 328).” With an improved ability to maintain an internal focus, the advanced student is able to reflect meaningfully upon his or her own performance.

Developmental models of therapist expertise provide a framework from which to study and interpret the cognitive, motivational, and metacognitive aspects of therapist expertise. Specifically, to facilitate expertise, therapist trainees must develop a highly structured and integrated organization of domain specific knowledge, and be motivated to undergo between 10 and 30 years of reflective

practice.

Summary

The novice-expert paradigm of the cognitive sciences has been rewarding to those interested in studying therapist expertise. Cognitive psychology research suggests that differences in the way knowledge is organized account for more efficient and accurate problem solving by experts (Glaser, 1984; Gobbo & Chi, 1986). Similarly, the majority of therapist expertise studies find that relative experts are superior to sub experts in their efficiency and accuracy of problem solutions. Despite the noted advantages of expertise, problem structure seems to attenuate performance for those with more experience. Characteristics of ill-structured problems often require experts to use additional time to create a meaningful problem representation. Ill-structured problems also impact the amount of information expert's process during the problem representation phase of problem solving. Because relative experts tend to have a greater number of domain specific knowledge structures, ill structured problems often result in experts comparing a greater number of existing cognitive structures (of problem types and solutions) for their potential to meet the demands of the current problem. The attenuating impact of ill structured problems on therapist expertise has been observed by (Martin et al., 1989). Furthermore, Hill and O'Grady (1985) found that therapists with approximately 10 years of post internship experience have been found to organize therapist intentions around two broad dimensions (support/assessment versus change and therapy work versus therapy problems).

Metacognitive processes of metacognition and self-reflection may also vary as a function of experience. Although metacognition is deemed important for individuals at all developmental levels; current thinking implies that knowledge of cognition is age dependent, more stable and more stable, whereas regulation of cognition is independent of age less stable and often unstable. That self-reflection is fundamental to achieve higher stages of therapist expertise Skovholt and Ronnestad's (2003) suggests advanced students might especially rely upon self-reflection as they are actively involved in structured training.

Research Questions and Hypotheses

The first research question addresses the following. If given a sorting task consisting of 19 therapist intentions, will senior professional therapists, advanced students, and lay helpers differ significantly on the following structural knowledge indicators: (a) card sort score, (b) time to complete the card sort and (c) the number of categories produced?

According to Skovholt and Ronnestad (1992), advanced students have developed "a refined mastery of conceptual ideas and techniques." In contrast, structural knowledge of senior professional therapists, like encapsulated knowledge of expert physicians is due largely to decades of experience and as a result is often times highly idiosyncratic (Remy, et al., 2002). It is also assumed that lay helpers have yet to garner the requisite years of experience to develop well organized knowledge structures of therapy. Based on the aforementioned assumptions, the following hypothesis will be tested relative to differences in participants' card sort scores.

Hypothesis 1a: Advanced student's card sort scores will be significantly higher than card sort scores of senior professional therapists who will have higher card sort scores than lay helpers.

Relative to the amount of time taken to complete the card sort, individuals with more experience tend to be more efficient than those with less experience in solving familiar problems in a given domain. An exception to this rule can be seen when individuals with more experience are confronted with less familiar or ill-structured problems. Under ill-structured conditions, those with more experience have been found to be comparatively less efficient (Chi & Glaser, 1985; Gagne, Gagne, Yekovitch, 1993) when solving tasks. The card sort task in this study more closely resembles an unfamiliar or ill-structured task. Given these findings and the ill-structured nature of the card sort, the following hypothesis will be tested.

Hypothesis 1b: Senior professional therapists will require significantly more time to complete the card sorting task than both advanced students and lay helpers.

Regarding the number of categories used to sort therapist intentions; individuals with more experience have developed numerous and elaborate cognitive schemas or scripts of potential problem types and solutions (Schmidt et al., 1993; Schmidt, et al., 1990). It is assumed that when faced with a relatively ill-structured problem; individuals with more experience scrutinize a larger number of cognitive structures, in turn, contributing to a greater number of categories. Based on these assumptions, the following hypothesis will be tested.

Hypothesis 1c: Senior professional therapists' card sorts will yield a

significantly greater number of categories than sorts of advanced students who will yield a significantly greater number of categories than lay helpers.

The second research question addresses the following question. When asked to provide ratings of metacognition and self-reflection; will significant differences be found in senior professional therapists, advanced students, and lay helpers self reported knowledge of cognition, regulation of cognition, and self-reflection?

The available literature (Flavell, 1985 cited in Garner & Alexander, 1989; Kreutzer, et al., 1975) suggests that knowledge of cognition develops incrementally as a function of time, is task and situation independent, stable, yet sensitive to erroneous self reports. As a result, individuals with more experience are likely to have developed a wealth of knowledge about themselves as a therapist. Given these considerations, the following hypothesis will be tested.

Hypothesis 2a: Senior professional therapists will report significantly higher knowledge of cognition than advanced students who will report significantly greater knowledge of cognition than lay helpers.

The available literature (Flavell, 1985 cited in Garner & Alexander, 1989; Kreutzer, et al., 1975) suggests that regulation of cognition is age independent, task and situation dependent, and often times unstable. By extension, individuals with more experience may not inherently report greater regulation of cognition. Furthermore, empirical research (Baker, 1987; Hammann & Stevens, 1989) consistently fails to find significant differences in regulation of cognition for individuals of varying experience levels. Given these considerations, the following hypothesis will be tested.

Hypothesis 2b: No significant developmental differences will exist for self reported regulation of cognition.

Skovholt and Ronnestad (1992) put forth the idea that self-reflection is an important variable that drives individuals professional development. According to these authors, lay-helpers predominantly rely in experiential forms of learning. In contrast, the advanced student is able to demonstrate an improved ability to maintain an internal focus and engage meaningfully in self-reflection (Skovholt & Ronnestad, 1992).

Hypothesis 2c: Advanced students will report significantly greater self-reflection than lay helpers and senior professional therapists.

The third research question assesses what linear combination of structural knowledge indicators (card sort score, time to complete card sort, and number of categories) and metacognitive variables (knowledge of cognition, regulation of cognition, and self-reflection) discriminate participants along the expertise continuum of lay helper, advanced student, and senior professional? No specific hypotheses were examined as the research question is exploratory in nature.

Chapter 3: Method

The present chapter details the design of the present study and consists of the following five elements: (a) a description of procedures for participant recruitment and data collection, (b) a description of the participants, (c) details of the instruments and measures used to collect structural knowledge and metacognition data, and (d) data analysis procedures.

Participant Recruitment

Participant recruitment involved two separate time periods: lay helpers were recruited during the first period, advanced students, and senior professional therapists were recruited during the second period. Recruitment of lay helpers was conducted from December 8th to December 15th, 2008. Recruitment of advanced students and experienced professionals was conducted from February 4th to July 19th, 2009. All potential participants were informed that the purpose of the study was to investigate the nature of therapist expertise.

To recruit lay helpers, the author visited four undergraduate sections of Psychology 433: Basic Helping Skills: Research and Practice courses and two undergraduate sections of EDCP 310: Peer Counseling: Theory and Skills at the student investigator's resident university. The recruiting visits briefly described the purpose of the study and secured email addresses of interested participants. Subsequent to the initial recruitment; potential participants received an email providing written information on the purpose, significance, and online nature of the study. The email also indicated the estimated participation time (i.e., approximately

20 minutes). The email encouraged interested individuals to “click” the electronic link to the study.

Recruitment of advanced students occurred in two phases. First; the student investigator sent an email to program directors of seven Counseling Psychology graduate programs with which the author had personal contacts (e.g., exchanged contact information at professional conferences), asking them to forward the email to all doctoral students enrolled in their respective program. The email described the purpose and online nature of the study, specified interest in students enrolled in the 3rd year or beyond of their doctoral program, and directed interested individuals who met criteria to “click” on the electronic link to the study.

A second means of recruiting advanced students was to email doctoral level interns at sites where the student investigator had a personal contact (e.g., a colleague of the student investigator on internship) asking them to forward the email described above to their fellow interns. The Immaculata University pre-doctoral internship consortium served as an additional source of pre-doctoral level interns.

To increase the sample size of the advanced student group the student investigator sent two-week and one-month reminders to faculty and training directors of Counseling Psychology graduate programs asking them to forward the reminder emails to students in their respective programs. Two-week reminder emails were sent by the student investigator to participants whose email addresses were known.

The American Board of Professional Psychology (ABPP) member directory was used to recruit experienced professional therapists. The ABPP directory was filtered for the Counseling Psychology specialty area, resulting in 202 potential ABPP

participants. The student investigator sent a letter of request to participate in the study printed on Counseling and Personnel Services Department departmental letterhead and signed by both the student investigator and dissertation advisor. The participation request letter described the purpose and online nature of the study, highlighted the importance of their designation as experts, and informed them of an email they would receive containing an electronic link to the survey. Two-week, one-month, and two-month follow-up emails were sent to prospective ABPP participants. See Appendix A for details of the initial recruitment and two-week follow up letters.

Data Collection Procedures

The choice of internet data collection methods was made given the many advantages of internet based research; including, the ease of obtaining large and nationwide samples, lower costs, security features, design options, ease of administration, and the finding that results tend to be equivalent to paper-and-pencil survey methods (Gosling, Vazire, Srivastava, & Srivastava, 2004). One common limitation of internet research includes problems in obtaining accurate response rates, as unknown numbers of individuals could potentially receive emails that link them to the study (Gosling et al., 2004). Another limitation of online research is the difficulty in guaranteeing confidentiality. In electronic submissions, there is always a small chance that a third party could intercept information (Gosling et al., 2004). In the current study, informed consent included the acknowledgment that confidentiality could not be completely guaranteed if participants choose to complete the survey.

Psychdata.com was the host of the questionnaire instruments. After “clicking” on the psychdata.com URL participants were directed to the web survey

introductory and eligibility requirements web page (Appendix B) asking them to indicate whether they met any of the three participation or screening criteria. Screening criteria required participants to indicate membership in one of the following groups: (a) advanced undergraduate student enrolled in either Psychology 433 or EDCP 310 skills, (b) 3rd year or advanced doctoral student enrolled in either counseling or clinical psychology Ph.D. program or a clinical psychology Psy.D program or (c) an ABPP member.

After participants checked a box indicating “yes” to meeting one of the participation criteria, they were directed to the Informed Consent page (See Appendix C). Participants directed to the informed consent page received instructions to (a) read the informed consent information, (b) provide their electronic signature by typing in their name, and (c) “clicking” on a box indicating whether or not they agree to participate in the study. Indicating their agreement to participate in the study directed participants to the survey questionnaires. Indicating non-agreement to participate in the study exited non-participants from the survey.

All participants who indicated agreement to participate in the study were first administered (a) the demographic questionnaire, (b) the 52 item MAI-TV, and (c) the SRIS. Upon completion of the survey portion of the study, participants were informed that the study was also designed to study therapist’s knowledge of therapy concepts. Participants were then asked to click on a URL link that sent them to the websort.net webpage. Immediately after participants accessed the card sort, participants were presented with instructions on how to conduct the card sort. Participants read the following instructions:

Before beginning the item sort, you will be asked to provide an email address. Please provide the email address used to contact you for this study.

On the left side of the following page, you will be presented with a list of therapy related items. The task is to sort the items into categories by dragging them from the left side panel to the sorting area of the page. While sorting, make sure to think about how the items relate to each other. When you have finished the sort please label the categories that you sorted the cards into by clicking the indicated category area. You can label the categories any way you like, including “don’t know (DK),” “not sure (NS)” and “not applicable (NA).” Remember, there is no right or wrong number of categories.

After completion of the card-sort, participants were prompted to save their sort and thanked for participating in the study.

Participants

Participants were undergraduate psychology and education majors at a public Mid-Atlantic university, counseling and clinical psychology doctoral students, and licensed psychologists. At the time of data collection, the undergraduate psychology students were enrolled in Psychology 433, an undergraduate basic helping skills course located in the Department of Psychology. The undergraduate education students were enrolled in EDCP 310, a basic helping skills course in the Department of Education. Doctoral students ranged from 3rd year doctoral students to 7th year doctoral students enrolled in APA accredited Counseling and Clinical Psychology programs in the United States. Licensed psychologists were ABPP members. The ABPP board certification process includes credentials review, peer-reviewed practice samples, and an oral examination conducted by existing ABPP certified psychologists.

An a priori statistical power analysis (Cohen, 1988) determined the desirable sample size given the desired power of .80 or greater, Type I error rate of = .05, and

an estimated population effect size of .25. Power analysis indicated that 125 participants were required to attain power of .80.

Instruments and Measures

The therapist intentions list (Hill & O'Grady, 1985) was used in an online card sort task (CST), hosted and administered on websort.net. The therapist intentions list consists of 19 minimally overlapping items with neutral language that represent general aims and goals common to all major forms of therapeutic treatment. See Appendix E for the list of therapist intentions. The CST measured various indicators of structural knowledge. Structural knowledge indicators were (a) card sort score, (b) time to complete the card sort, and (c) the number of card sort categories. Hill and O'Grady provide adequate face and predictive validity of the 19 therapist intentions.

The Metacognitive Awareness Inventory-Therapy Version (MAI-TV) is a 52-item adaptation of the MAI, (Schraw & Dennison, 1994) developed for the present study to assess metacognition in the domain of counseling and therapy. The student investigator revised items of the original domain general MAI to assess participant's current perceptions of their self-knowledge as a therapist (knowledge of cognition) and their ability to demonstrate specific regulatory acts (regulation of cognition) rather than their intention or future plans to engage in these regulatory acts. According to these guidelines, the current study defines therapist metacognitive awareness as participants' perceived self-knowledge as a therapist and their ability to demonstrate a set of knowledge regulating strategies before, during and after counseling and therapy sessions.

As can be seen, the MAI-TV maintained the two-dimensional nature of the original MAI. Furthermore, the student investigator relied upon the counselor and therapist development literature to inform item revisions. The following two tenets guided item content revisions. First, reflecting about one's practical experiences is critical to therapist learning and expertise. For example, Ward and House (1998) describe reflective learning applied to counselor development as management of concentration, comprehension, and affect. Secondly, empirical findings of Neufeldt, et al. (1996) identified therapist's locus of self-attention as their own "thoughts, actions and emotions (p. 24).

Item development involved 65 total revisions of the original 52 MAI items. These 65 revisions involved 34 revisions and 31 additions. Revisions of the original MAI were made to several words: "learning," "task," "test," "topic," "problem," "study," "material," "intellectual," and "solving a problem." Several different revisions were made for references to "learning," including, "during sessions," "work," "therapy," "deliver therapy strategies," and "managing client information." The word "task" was converted to "session" on three separate items. The word "test" was converted to "session" on one occasion. The word "topic" was converted to "presenting problem" on one occasion. Four of the additions were "a session(s)," eight were "client," six additions were "therapy/therapeutic," six were "about my client," one was "myself," two were "session notes or tapes," one was "among things my client say," one was "among things my client brings up," one was "about my client disclosures," one was "mental." Appendix F provides the list of item-by-item changes to the original MAI.

The MAI-TV measures two components of metacognition: (a) knowledge of cognition and (b) regulation of cognition. Sample knowledge of cognition items include: (1) “I understand my therapy strengths and weaknesses,” (2) “I have a specific purpose for each therapy strategy I use” and (3) “I use different therapy strategies depending on the situation.” Sample regulation of cognition items include: (1) “I think about what I really need to learn about my client before I begin a session,” (2) “I find myself pausing regularly to check my comprehension of my clients,” (3) “I reevaluate my assumptions about my clients when I get confused,” (4) “I consciously focus my attention on important client information,” (5) “I summarize what I learned after I finish a session,” (6) “I create my own examples to make client information more meaningful.” The MAI-TV instructions directed participants to use a 5-point likert scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*) to respond to items based on their current confidence levels of demonstrating various metacognitive acts before, during and after therapy sessions. Participants recorded their responses by circling the number that best corresponds to how true or false the statement is about them.

The self-reflection and insight scale (SRIS, Grant, Franklin & Langford, 2002) is a measure of private self consciousness developed to assess “sociocognitive and metacognitive processes central to purposeful individual change” (p. 833). The measure assesses the processes of self-reflection (SRIS-SR) and insight (SRIS-IN) following a program of systemized change, such as occurs in the coaching process or in a clinical training (Grant et al., 2002). Only self-reflection sub-scale data is used for the present study. The SRIS (Appendix G) assesses the multidimensional nature

of self-reflection consisting of the following subscales: (a) Need for Self-Reflection and (b) Engagement in Self-Reflection. A sample Need for Self-reflection sub-scale item is “I am very interested in examining what I think about.” A sample Engagement in self-reflection sub-scale item is “I often think about the way I think about things.” In their development and validation study, Grant et al. (2002) reported a high internal consistency scale score, with coefficient alpha values of .91 for the self-reflection scale. Test-re-test reliability over 7 weeks for the self-reflection scale was .77 ($p < .001$). The SRIS-SR scale instructions directed participants to use a 5-point likert scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*) to respond to items based on their state of mind after therapy sessions.

The Theoretical Orientation Profile Scale-Revised (TOPS-R, Worthington, Dillon, 2003) was developed from an unpublished version of the 10-item Theoretical Orientation Profile Scale (TOPS, Worthington & Dillon, 2000). The TOPS-R is an 18-item scale containing three items for each of six theoretical orientations: psychoanalytic/psychodynamic, humanistic/existential, cognitive-behavioral, family systems, multicultural, and feminist. Three items assess adherence to each of the six theoretical orientations. Theoretical identification items refer to the extent to which respondents identify with each particular theoretical orientation (e.g., I identify with cognitive-behavioral orientation). Conceptual orientation items refer to the extent to which respondents conceptualize cases from the perspective of each theoretical orientation (e.g., I conceptualize cases from a psychoanalytic/dynamic perspective). Finally, methodological orientation items refer to the extent to which respondents use methods associated with each theoretical orientation (e.g., I utilize feminist

techniques). All theoretical orientation profile scale-revised items were rated on a 5 point likert scale (1 = *low* to 5 = *high*). The TOPS-R items are presented in Appendix H.

Participants were asked to provide demographic information including their age, gender, race, type of graduate program and year in their program, approximate number of clinical hours, and years of clinical experience. The demographic questionnaire is presented in Appendix I.

Data Analysis

All statistics were calculated using the Statistical Package for Social Sciences (SPSS; Release 18.0, Gradpack, 2007). Cronbach's alphas for the knowledge of cognition, regulation of cognition and self-reflection scales were calculated using a Pearson product moment correlation. An independent samples t-test was also conducted to test for a significant difference between advanced students and senior professionals theoretical orientation scores.

The following statistical procedures addressed the research questions and hypotheses posed in the present study. Hypotheses 1a-1c were tested by a 3 x 3 [card sort score, minutes to complete card sort, and number of categories] x [lay helper, advanced student, senior professional therapist] and examined the effect of experience level on structural knowledge indicators.

Participants card sort scores reflect the degree to which each intention item were correctly sorted into a predetermined category based on Hill and O'Grady's (1985) 2 dimensional therapist intentions solution. Specifically, the 19 therapist

intentions defined by Hill and O’Grady should be ideally sorted into five distinct categories as reflected in Table 1 below.

Table 1

Five Cluster Solution of Therapist Intentions Hill and O’Grady (1985)

Support-Assessment	Therapeutic Work	Change	Relationship Problems	Non-Specific Factors
(2) Get Information	(9) Identify Maladaptive Cognitions	(14) Promote Change	(1) Set Limits	(4) Support
(5) Focus	(10) Identify Maladaptive Behaviors	(15) Reinforce Change	(3) Give Information	(7) Instill Hope
(6) Clarify	(11) Encourage Self Control		(16) Deal with Resistance	(8) Encourage Catharsis
	(12) Identify & Intensify Feelings		(19) Relieve Therapist’s Needs	(17) Challenge
	(13) Promote Insight			(18) Deal with Therapeutic Relationship

Note: Parenthesized value is the sequential number of the card sort item.

A quantitative scoring procedure was developed to create a numeric card sort score for each participant who completed the card sorting task. In most cases, participant’s sorts will not achieve the ideal five category solution. There may be cases where a participant defines as few as 1 or as many as 19 categories. A value of five points is given to each individual item within a category when the optimal category solution is achieved. Analytic syntax was developed to complete the card-sort scoring. For example, starting with card-sort Item 1, “Set Limits,” the program defined a cluster and compared each subsequent item for cluster adherence. The syntax used to score participants card sorts is specified in Appendix K.

In the quantification process, point values were logically reduced as participants' card sorts differed from the ideal five category solution. For example, four points were assigned to correctly sorted intentions when only four categories were identified. Similarly, four points were assigned to correctly sorted items when six categories were identified. Table 2 provides a listing of scores assigned to individual items based on the numbers of clusters defined by the respondent. It is important to note that a value of one point is assigned to items for cases when nine or more categories are designated. Five category scores and one total card sort score was generated for each participant. Thus, a maximum total card sort score value of 95 (i.e., 19 items \times 5 points) could be achieved through this procedure.

Table 2

Score Values for Correctly Sorted Items Based on Number of Categories

Number of Categories	Points per Item
1 Category	1 Point
2 Categories	2 points
3 Categories	3 points
4 Categories	4 points
5 Categories	5 points
6 Categories	4 Points
7 Categories	3 Points
8 Categories	2 Points
9 or More Categories	1 Point

Hypotheses 2a-2c was tested by a 3 x 3 one way MANOVA [knowledge of cognition, regulation of cognition, self-reflection] x [lay helpers, advanced students, senior professional therapists] to examine the effect of experience level on knowledge of cognition, regulation of cognition, and self-reflection. Follow up ANOVA's were used to analyze the variance in structural knowledge and metacognitive process scores across levels of experience. Significance, effect size, and estimates of power for each ANOVA are reported. Post hoc Tukey's t-tests were conducted on those variables that had significant ANOVA results.

Discriminant analysis addressed the third research question. Namely, what linear combination of accuracy of structural knowledge indicators and metacognitive processes (knowledge of cognition, regulation of cognition, and self-reflection) differentiate participants along the therapist experience continuum.

A follow up multidimensional scaling analysis (MDS) was conducted to assess for the existence of experience level differences in the structural organization of therapist intentions. Table 3 specifies all research questions, hypotheses, variables, and types of analyses used in the present study.

Table 3

Research Questions, Hypotheses, Variables and Analyses

Research Q. 1 Are structural knowledge indicator scores significantly different between groups of lay student helpers, advanced students and senior professional therapists?		
Hypotheses	Variables	Analyses
Hypothesis 1a: Advanced student's card scores will be significantly higher than card sort scores of senior professionals who will have higher card sort scores than lay helpers.	Structural Knowledge as measured by Card Sort Score, Number of Categories, Time to Complete Sort (Dependent Variable, Interval Data)	MANOVA EFFECT SIZE
Hypothesis 1b: Senior professionals will require significantly more time to complete the card sorting task than both advanced students and lay helpers.	Therapist Expertise Level: Lay helper, Advanced student, senior professional (Independent Variable, Ordinal Level Data)	
Hypothesis 1c: Senior professionals' sorts will yield significantly greater number of categories than sorts of both advanced students and lay helpers.		
Research Q. 2 Are metacognition and self-reflection scores significantly different between groups of lay helpers, advanced students and experienced senior professional therapists?		
Hypotheses	Variables	Analysis
Hypothesis 2a: Experienced professionals will report significantly higher knowledge of cognition than advanced students who will report significantly greater knowledge of cognition than lay helpers.	Knowledge of Cognition and Regulation of Cognition) as measured by the MAI-TV (Dependent Variable, Interval Data)	MANOVA EFFECT SIZE POWER
Hypothesis 2b: No significant experience level differences will exist for self reported regulation of cognition.	Self-reflection as measured by the Self-reflection and Insight Scale (Dependent Variable, Interval Data).	
Hypothesis 2c: Advanced trainees and senior professional therapists will report significantly greater self-reflection than lay helpers.	Therapist Expertise Level: Lay helper, Advanced student, senior professional (Independent Variable, Ordinal Level Data)	

Research Q. 3 What linear combination structural knowledge indicators and metacognitive processes discriminate individuals along the therapist experience continuum of lay helper, advanced student and senior professional therapists?		
Hypotheses	Variables	Analysis
None	<p>Structural Knowledge as measured by Card Sort score and Time to complete sort (Card Sort Score Predictor Level Variable)</p> <p>Knowledge of cognition and Regulation of cognition as measured by the MAI-TV (Predictor Variable, Interval Data)</p> <p>Self-reflection as measured by the Self-reflection subscale (Predictor Variable, Interval Level)</p> <p>Therapist Experience Level: Lay helper, Advanced student, senior professional (Independent Variable, Ordinal Level Data)</p>	Discriminant Analysis

Additional Analysis

A follow up multidimensional scaling analysis (MDS) was conducted to assess for the existence of experience level differences in the structural organization of therapist intentions. MDS refers to a group of descriptive procedures that transform data into mapped elements in one or more spatial dimensions (Kruskal & Wish, 1978). For this reason, MDS analysis was conducted to uncover the spatial dimensions of therapist structural knowledge of the therapeutic process. Typical data for MDS are numbers that indicate object similarity or proximity. The term object refers to any collection of "things of interest to the researcher, such as people, items, attributes, and stimuli" (Fitzgerald & Hubert, 1987, p 471). Proximity refers to any

numerical measure of similarity or dissimilarity, including correlations, similarity judgments, and co-occurrence frequencies from free sorts (Fitzgerald and Hubert, 1987).

The primary objective of MDS is identification of the best fitting solution with the smallest number of dimensions. At least three factors should be considered in choosing the number of dimensions in a given MDS analysis. The first consideration is the number of objects, the second, is Kruskal's stress function (1964) the squared correlation coefficient (R^2) is the third.

For stability considerations, a convenient empirical guideline with nonmetric scaling is $4k + 1$ objects for a k dimensional solution (Kruskal & Wish, 1978). The present study consists of 19 total objects, thus a solution consisting of no more than 4 dimensions is likely to yield a stable solution. Values for Kruskal's (1964) stress function vary between zero and one. The smaller the stress function, the better the model represents the input data. Although no strict rule exists regarding how much stress is tolerable, the rule of thumb is that a value ≤ 0.1 is excellent and anything ≥ 0.15 is not tolerable (Kruskal & Wish, 1978). Another measure of goodness-of-fit is the squared correlation coefficient (R^2). The squared correlation coefficient quantifies the proportion of variance of the proximity data accounted for by a given n -dimensional MDS solution (Jaworska & Chupetlovska-Anastasova, 2009). Higher R^2 values indicate a better fit between a given proximity matrix and their corresponding distances in n -dimensional space (Norusis, 2005). $R^2 \geq 0.60$ is considered an acceptable fit.

Group differences in three-way scaling solutions are reflected by dimensional weights that indicate the importance, or salience, each group attached to each dimension. The weirdness index indicates how unusual each subject's weights are relative to the weights of the typical subject analyzed. The weirdness index varies from zero to one, where a score of zero indicates that the subject's weights are proportional to the average weights for n number of groups. As the subject's score becomes more extreme the index approaches one, suggesting that optimal spatial configuration or scaling solution fits that subject poorly.

A nonmetric MDS analysis was conducted on all participants' card sort data. A single matrix of dissimilarity was computed that represent similarity judgments of the 19 therapist intentions across all three experience level groups. Values in the matrix represent the percentage of times each therapist intention was placed with every other therapist intention during the card sort. The resulting group configuration is an n dimensional solution based on the set of three matrices.

Chapter 4: Results

This chapter presents the results of the study using descriptive and inferential statistics. Characteristics of the sample are first described. Next, psychometric properties for each instrument are reported. Finally, results of each research question and hypothesis is reported.

Sample

Three groups: lay helpers ($n = 38$), advanced students ($n = 39$), and senior professional therapists ($n = 28$) contributed usable questionnaire data to the study. More than half were women (63.8%), whereas men comprised 36.2% of the sample. The majority of the sample was White American (82.8%); others were African American (4.8%), Hispanic/Latino (5.7%), Asian (6.7%), and other (1%).

At the time of data collection, lay helpers were enrolled in one of two undergraduate helping skills courses: Psychology 433 ($n = 14$) and EDCP 310 ($n = 24$). Advanced students were enrolled in Counseling Psychology Ph.D. programs ($n = 22$), Clinical Psychology Ph.D. ($n = 2$), and Clinical Psychology Psy.D. programs ($n = 10$). All 28 senior professional therapists were members of the Counseling Psychology division of the American Board of Professional Psychology (ABPP). Of the ABPP members, 11 worked in a private practice, 8 worked in a hospital or medical setting, 5 worked in an outpatient community mental health setting, and 4 worked in college counseling centers. The sample as a whole is wide ranging in terms of age and years of clinical experience. Tables 4-8 contain a summary of the demographic characteristics of the sample.

Sample Characteristics

Table 4

Age and Years of Experience

Continuous Variables	N	Minimum	Maximum	Mean	SD
Age	105	20	80	34.43	16.97
Years of Clinical Experience	105	1	41	10.48	13.21

Table 5

Gender by Level of Experience

Gender	Experience Level			Total
	Lay Helper	Advanced Student	Senior Professional	
Female	27	36	4	67
Male	11	3	24	38
Total	38	39	28	105

Table 6

Race/Ethnicity by Level of Experience

Ethnicity	Experience Level			Total
	Lay Helper	Advanced Student	Senior Professional	
White	32	29	26	87
African-American/Black	3	2	0	5
Hispanic/Latino	0	5	1	6
Asian	3	3	1	7
Total	38	39	28	105

Table 7

Years of Experience by Level of Experience

Experience Level	N	Minimum	Maximum	Mean	SD
Lay Helper	38	1	2	1.13	.34
Advanced Student	39	3	9	4.72	1.55
Senior Professional Therapist	28	14	41	31.18	7.32

Table 8

Age by Level of Experience

Level of Experience	Mean	Age Range	F	%
Lay Helper	21.32	20 to 24	37	97.4
		25 to 29	1	2.6
Advanced Student	31.67	20 to 24	8	20.5
		25 to 29	22	56.4
		30 to 59	9	23.1
Senior Professional Therapist	55.8	30 to 59	13	46.4
		60 or >	15	53.6
Total			105	100

Table 9 displays means and standard deviations of participant's theoretical orientation scores. The theoretical orientation with the highest mean score for the entire sample was multicultural ($M = 10.50$, $SD = 2.88$). The existential theoretical orientation scale had the lowest average ($M = 7.80$, $SD = 3.03$) for the entire sample.

Table 9

Means and Standard Deviations of Theoretical Orientation Preference Scale Scores

Theoretical Orientation	N	Minimum	Maximum	Mean	SD
Psychoanalytic/Dynamic	105	3	15	9.00	3.47
Existential	105	3	15	7.80	3.03
Cognitive Behavioral	105	3	15	9.55	3.25
Family Systems	105	3	15	8.88	3.12
Feminist	105	3	15	7.95	3.62
Multicultural	105	2	15	10.50	2.88

Preliminary analysis assessed for differences in theoretical orientation scores between advanced students and senior professional therapists. It was assumed that lay helpers have yet to develop a meaningfully informed theoretical orientation. As a result, lay helpers were not included in the t-test. Table 10 displays results of the t-test comparing theoretical orientation scores of advanced students and senior professional therapists. The advanced student group was found to have significantly higher multicultural and feminist theoretical orientation scores than senior professional therapists. Senior professional therapists had higher existential, cognitive-behavioral, and family systems theoretical orientation scores. No differences were found for Psychoanalytic/Dynamic theoretical orientation scores.

Table 10

Mean Theoretical Orientations Scores by Level of Experience

Theoretical Orientation Variables	Advanced Students		Senior Professional Therapists	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Psychoanalytic/Dynamic	9.87	3.91	8.25	3.42
Existential	7.21 [*]	2.74	9.21 [*]	3.52
Cognitive Behavioral	8.74 [*]	3.36	10.89 [*]	3.35
Family Systems	8.49 ^{**}	2.96	10.64 ^{**}	3.05
Feminist	9.64 [*]	3.86	7.50 [*]	3.18
Multicultural	11.87 ^{**}	2.67	10.04 ^{**}	2.62

Note. $N = 105$. ^{*} $p < .05$, ^{**} $p < .01$.

Instrument Psychometrics

The MAI-TV consists of the knowledge of cognition and regulation of cognition subscales. The Self-reflection subscale of the SRIS consists of the need for self-reflection and engagement in self-reflection factors. Creators of the SRIS suggest combining the need for self-reflection and the engagement in self-reflection factors to obtain a total self-reflection subscale score. Responses to the MAI-TV and the SRIS-SR were provided by all 153 participants.

Before analyzing the data, the internal consistency of the three subscales was examined using Cronbach's alpha. These analyses indicated that all three subscales were internally consistent: knowledge of cognition (.79), regulation of cognition (.89) and self-reflection (.93). Descriptive statistics of the continuous variables are reported in Table 11. Intercorrelations among the continuous variables are presented

in Table 12. Intercorrelations among theoretical orientation variables are presented in Table 13.

Table 11

Means and Standard Deviations of Continuous Measures

Continuous Variables	N	Minimum	Maximum	Mean	SD
Card Sort Score	105	4	70	38.90	12.90
Number of Card Sort Categories	105	2	13	4.60	1.93
Minutes to Complete Card Sort	105	3	27	8.50	4.94
Knowledge of Cognition	105	43	78	64.50	6.48
Regulation of Cognition	105	62	157	126.99	14.15
Self-reflection	105	27	60	50.45	7.40

Table 12

Intercorrelations between Continuous Variables

	1	2	3	4	5	6	7	8
Age	1							
Years of Therapy Experience	.96**	1						
Card Sort Score	-.25*	-.27**	1					
Number of Card Sort Categories	.23*	.27**	-.32**	1				
Minutes to Complete Sort	.31	.28**	.03	.40***	1			
Knowledge of Cognition	.26**	.20*	.08	.09	.11	1		
Regulation of Cognition	-.05	-.16	.03	-.07	-.13	.53***	1	
Self-reflection	-.06	-.13	.02	.15	.15	.46***	.42***	1

Note. $N = 105$. * $p < .05$., ** $p < .01$., *** $p \leq .001$.

Table 13

Intercorrelations between Theoretical Orientation Scores

	1	2	3	4	5	6
Psychoanalytic/Dynamic	1					
Existential	.03	1				
Cognitive Behavioral	-.29**	.04	1			
Family Systems	-.08	.28**	.27**	1		
Feminist	.29**	.18	-.17	.12	1	
Multicultural	.19	.26**	.03	-.17	.46***	1

Note. $N = 105$. * $p < .05$., ** $p < .01$., *** $p \leq .001$.

Research Question 1

The first research question examined whether structural knowledge scores differed significantly across levels of experience. A one-way multivariate analysis of variance (MANOVA) was conducted on the dependent variables: (a) card sort score, (b) number of categories and (c) minutes to complete card sort across three levels of experience. Results indicated a significant multivariate main effect for experience level, Wilks's multivariate statistics = .13, $F(10, 198) = 2.22$, $p < .01$, partial eta squared = .14. The effect size estimate of .14 is interpreted as a small effect size. Table 14 summarizes means and standard deviations of the structural knowledge indicators.

Hypothesis 1a predicted that advanced students' card sort scores would be significantly higher than card sort scores for senior professional therapists whose scores would be significantly higher than lay helpers. Hypothesis 1a was partially supported. A significant univariate expertise level main effect was obtained for total card sort score, $F(2, 104) = 5.07$, $p < .01$, partial eta square = .09. Examination of pairwise experience level differences for participant's card sort scores found that on

average, advanced student's card sort scores (43.46) were higher than senior professional therapists card sort scores (33.82). The second half of the hypothesis was not supported. Lay helpers card sort scores (37.97) were found to be higher than that of senior professionals; however this difference was not statistically significant.

Hypothesis 1b predicted that senior professionals would require significantly more time to complete the card sort than advanced students who would require more time than lay helpers to complete the card sort. Hypothesis 1b was partially supported. A significant univariate experience level main effect was obtained for minutes to complete the card sort, $F(2, 104) = 8.03, p < .01$, partial eta square = .09. Examination of pairwise experience level differences for minutes to complete the card sort found that lay helpers used significantly less time to complete the sort (6.13 min.) than both advanced students (9.46 min.) and senior professional therapists (10.36 min.). The mean difference in time taken to complete the card sort between advanced students and senior professional therapists was not statistically significant.

Hypothesis 1c predicted that senior professional therapist's card sorts would yield a significantly greater number of categories than advanced students' card sorts who would yield more categories than lay helper's card sorts. Hypothesis 1c was partially supported. A significant univariate experience level main effect was obtained for the number of card sort categories, $F(2, 104) = 4.54, p < .05$, partial eta square = .14.

Examination of pairwise experience level differences for the number of card sort categories found that as hypothesized, senior professional therapist's card sorts yielded more categories than advanced students (5.43 categories vs. 4.56 categories).

The hypothesis that advanced students card sorts would yield significantly more categories than lay helpers was not supported (4.56 categories vs. 4.02 categories).

Table 14

Structural Knowledge Indicators as a Function of Level of Experience

Variables	Lay Helpers		Advanced Students		Senior Professional Therapists		$F(2,104)$	η^2
	M	SD	M	SD	M	SD		
Total Card Sort Score	37.97 _b	12.20	43.46 _a	10.04	33.82 _b	15.40	5.07**	.09
Minutes to Complete Sort	6.13 _a	3.55	9.46 _b	5.84	10.36 _b	3.99	8.03**	.09
Number of Card Sort Categories	4.03 _b	1.55	4.56 _b	1.25	5.43 _a	2.78	4.54*	.14

Note. N s for the three conditions were 38, 39, and 28, respectively. Means with different subscripts in the same row differ significantly from one another (** = $p < .01$, * = $p < .05$ Tukey's post hoc comparisons); those sharing the same subscript are not significantly different.

Research Question 2

The second research question examined whether significant differences in metacognitive processes exist across levels of experience. A one-way MANOVA was conducted on the following self report variables: regulation of cognition, knowledge of cognition, and self-reflection. MANOVA results revealed a significant multivariate main effect for experience level, Wilks's lambda = .36, $F(8, 198.00) = 5.53$, $p < .01$, partial eta squared = .18. An effect size of .39 can be interpreted as a medium effect size. The means and standard deviations are presented in Table 15.

Hypothesis 2a predicted that senior professional therapist's would report significantly greater knowledge of cognition than advanced students who would report significantly greater knowledge of cognition than lay helpers. Hypothesis 2a was partially supported. A significant univariate experience level main effect was obtained for knowledge of cognition, $F(2, 104) = 5.86, p < .01$, partial eta square = .12. Examination of pairwise experience level differences indicated that both the senior professional therapist group (66.39) and advanced student group (65.79) reported significantly higher knowledge of cognition than lay helpers (61.76). Contrary to what was hypothesized, significant differences were not found to exist between senior professional therapists and advanced students self reported knowledge of cognition.

Hypothesis 2b predicted that no significant experience level differences would exist for self reported regulation of cognition. No significant experience level differences were found to exist for regulation of cognition $F(2, 104) = 1.76, ns$.

Hypothesis 2c predicted that advanced students would report significantly greater self-reflection than lay helpers and senior professional therapists. Hypothesis 2c was fully supported. A significant univariate experience level main effect was obtained for self-reflection, $F(2, 104) = 12.07, p < .01$, partial eta square = .19. An effect size of .16 can be interpreted as small. Examination of pairwise experience level differences found that advanced students reported significantly higher self-reflection (54.64) than lay helpers (47.73) and senior professional therapists (48.32).

Table 15

Metacognition and Self-reflection as a Function of Experience Level

Variables	Lay Helpers		Advanced Students		Senior Professional Therapists		$F(2,104)$	η^2
	M	SD	M	SD	M	SD		
Knowledge of Cognition	61.76 _a	6.91	65.79 _b	5.36	66.39 _b	6.27	5.86 ^{**}	.19
Regulation of Cognition	125.66 _b	12.77	130.26 _b	12.46	124.25 _b	17.41	1.76	NA
Self Reflection	47.73 _b	8.34	54.64 _a	4.72	48.32 _b	6.66	12.07 ^{***}	.16

Note. N s for the three conditions were 38, 39, and 28, respectively. Means with different subscripts in the same row differ significantly from one another (** = $p < .01$; *** = $p < .001$, Tukey's post hoc comparisons); those sharing the same subscript are not significantly different.

Research Question 3

A forced predictive discriminant analysis (PDA) was performed on the following continuous variables: (a) card sort score, (b) time to complete the card sort, (c) knowledge of cognition, (d) regulation of cognition, and (e) self-reflection to assess how well these set of variables accounted for the a priori group memberships created in the present study. PDA yielded two statistically significant discriminant functions, with a Wilks' Lambda of .64. The first function accounted for 58.1% of the variance; the second function accounted for the remaining 41.9% of the variance. The results indicate that card sort score, self-reflection, knowledge of cognition, and minutes to complete the card sort explain approximately 36% of the variance between

the three sampled groups. Results of the discriminant function analyses are presented in Table 16.

Table 16

Discriminant Function Results using all Predictor Variables

Discriminant Function	Eigenvalue	% of Variance	Canonical Correlation	Wilk's Λ	<i>P</i>
1	.38	58.1	.53	.57	<.0001
2	.28	41.9	.47	.78	<.0001

Examination of standardized discriminant function coefficients demonstrated that self-reflection (.99) and card sort score (.65) had the highest loading on the first discriminant function. Minutes to complete the card sort (.77) and knowledge of cognition (.68) had the highest loading on the second function. Standardized and unstandardized coefficients for the two discriminant functions are reported in Table 17.

Table 17

Discriminant Function Coefficients for Variables in the Model

Variables Entered	Discriminant Function 1 Coefficients		Discriminant Function 2 Coefficients	
	Standardized	Unstandardized	Standardized	Unstandardized
Card Sort Score	.65	.05	-.15	-.01
Self-reflection	.99	.15	-.05	<.01
Knowledge of Cognition	-.40	-.07	.68	.11
Minutes to Complete Sort	-.08	-.02	.77	.17
Constant Coefficient		-5.08		-7.61

The two discriminant functions correctly predicted 66.7% of all participants. Based on Wilk's Lambda, the two discriminant functions predicted the correct classification for 60.5% of lay helpers, 69.2% of advanced students and 71.4% of senior professional therapists. Table 18 presents the classification results obtained from the PDA analysis.

Table 18

Discriminant Function Classification Results

Actual Level of Experience	Predicted Level of Experience		
	Lay Helpers	Advanced Students	Senior Professional Therapists
Lay Helpers	23 (60.5%)	9 (23.7%)	6 (15.8%)
Advanced Students	9 (23.7%)	27 (69.2%)	6 (15.8%)
Senior Professional Therapists	5 (17.9%)	3 (10.7%)	20 (71.4%)

Note. Values on the diagonal are hits and are in boldface type. There are a total of 70 hits, or 66.7%.

In PDA examination of the group centroids (average discriminant scores assigned to each member in the group) in conjunction with the discriminant function structure matrix allow for a content evaluation of the two discriminant functions for the three experience level groups. Group centroid and structure matrix data are available in Table 19. The structure matrix depicts correlations between each predictor variable and the standardized discriminant functions are used to interpret content function (Betz, 1987). It may be noted from the centroids that the first and largest discriminant function separates senior professional therapists (with the large

negative centroid) from advanced students (large positive centroid). The variables having the highest loadings on function one were self-reflection and total card sort score on which higher scores were characteristic of the advanced student group versus expert group. The second function separated the lay helper group (large negative centroid) from the senior professional therapist group (large positive centroid). The variables having the highest loading on function 2 were minutes to complete the card sort and knowledge of cognition on which higher scores were characteristic of the senior professional therapist group and lower scores characterizing the lay helper group.

Table 19

Group Centroids and Structure Matrix for Discriminant Analysis

Group or Variable	Discriminant Function	
	1	2
Group	Group Centroids	
Lay Helpers	-.23	-.66
Advanced Students	.75	.22
Senior Professionals	-.73	.59
Variable	Discriminant Structure Matrix	
Self-reflection	.73 [*]	.36
Card Sort Score	.51 [*]	-.06
Knowledge of Cognition	.10	.64 [*]
Minutes to Complete Sort	.15	.75 [*]

Additional Analysis

MDS was used in the current study to identify salient dimensions of structural knowledge and to quantify the relative reliance lay helpers; advanced students and senior professional therapists place upon specific dimensions of therapist intentions relative to the exclusion of others. Therapist structural knowledge is operationalized by participants' sorting of the 19 therapist intentions. To determine which MDS solution best fit the proximity data; the student investigator followed recommendations offered by Kruskal and Wish, (1978) and examined indices of goodness-of-fit to the data of MDS solutions across 2 to 6 dimensions. Table 20 shows that Goodness-of-fit indices ranged from a stress value of .34 and $R^2 = .37$ for the 2-dimensional solution to a 6-dimensional MDS solution with a stress value of .12 and $R^2 = .71$.

Table 20

Measures of Goodness-of-Fit for Multidimensional Scaling Analysis Solutions in 2 to 6 Dimensions

	<i>Number of dimensions</i>				
Measures	2	3	4	5	6
Stress value	.34	.25	.17	.14	.12
R^2	.37	.52	.64	.69	.71

Examination of the stress and R^2 values for dimensions 2-6 indicates that dimensions 4 through 6 have acceptable R^2 values. Stress values approach the suggested cutoff of < .15 at dimension 5, but with minimal improvement in R^2 , suggesting that an MDS solution with 4 dimensions fit the data most parsimoniously. Figure 3 provides a graphical depiction of stress values for MDS solutions with dimensionality of 2-6. As can be seen in Figure 3; the slope of the line levels after

dimension 3, which compares the MDS solutions in 3 versus 4 dimensions.

Therefore, it was determined that the 4-dimensional solution (stress = .17, $R^2 = .64$)

best fits the data and would maximize the interpretability of the MDS results.

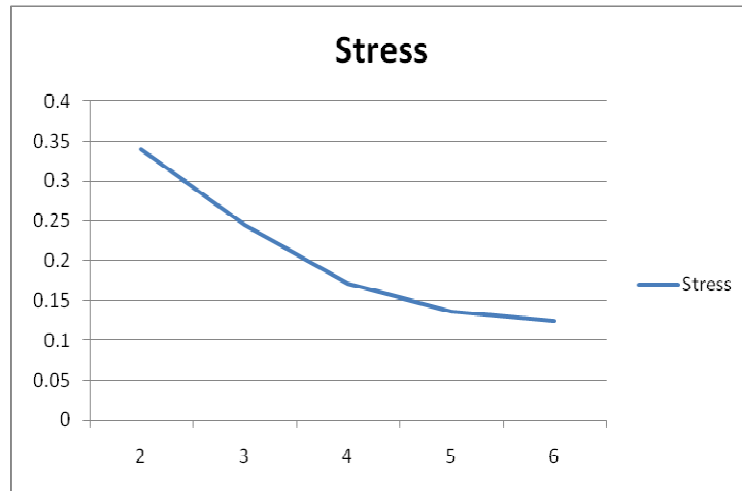


Figure 3. Change in Stress Values for MDS Solutions in 2-6 Dimensions

Derived Stimulus Configuration

Individual differences (weighted) Euclidean distance model

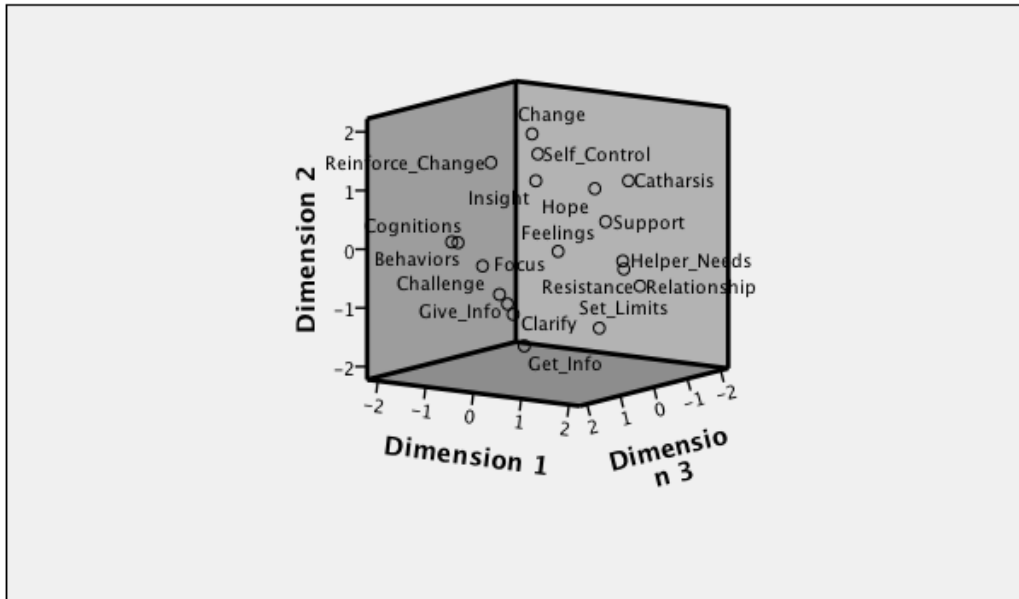


Figure 4. Derived Stimulus Configuration of 4 Dimensional MDS Solution

Interpretation of MDS Solution

Therapist intentions corresponding to the most extreme stimulus coordinate values on the positive and negative pole of each of the four dimensions within the selected MDS solution were examined. Intentions with absolute stimulus coordinate values greater than 1.00 were considered to make more substantive contributions to the interpretation of a given dimension relative to statements with absolute values below the cutoff value; that is, 1.00. Interpretation of the clusters of intentions were made based on several factors, including the definition of the individual intentions, similarity to the intentions clusters identified in the 2 dimensional Hill and O'Grady

(1985) solution and the degree to which the clusters of intentions represent two readily interpretable ends of one continuum.

As shown in Table 21, Dimension 1 consists of several therapist intentions with stimulus coordinates above the recommended absolute value cutoff of 1. For example, stimulus coordinate values of ≤ 1 were found for “get information,” “give information,” “focus,” and “clarify.” Intentions with stimulus coordinate values of ≥ 1 were “insight” and “catharsis.” Given the similarity of the two clusters of intentions with clusters identified by Hill and O’Grady (1985) Dimension 1 was defined as “Assessment/Education versus Therapeutic Work.”

As shown in Dimension 2, therapist intentions with stimulus coordinate absolute values of ≤ 1 were “therapeutic relationship,” “set limits,” “resistance,” and “relieve therapists needs.” Intentions with stimulus coordinate values ≥ 1 were “change,” “reinforcing change,” “self control,” “cognitions,” and “behaviors.” Given the similarity of the two clusters of intentions with clusters identified by Hill and O’Grady (1985) Dimension 2 was defined “Therapeutic Problems versus Therapeutic Change Processes.”

As shown in Dimension 3, therapist intentions with stimulus coordinate absolute values of ≤ 1 were “cognitions,” “behaviors,” “resistance,” and “therapeutic relationship.” Intentions with stimulus coordinate values ≥ 1 were intentions of “support,” “hope,” and “focus.” Based on the definitions of the intentions and their unique cluster pattern, Dimension 3 was named “Challenge versus Support.”

As seen in Dimension 4, therapist intentions with stimulus coordinate absolute values of ≤ 1 were “feelings,” “insight,” “clarify,” and “challenge.” Intentions with

stimulus coordinate values ≥ 1 were intentions of “relieve therapist’s needs,” “self control,” “clarify,” and “set limits.” Based on the definitions of the intentions and existing literature (Hill & O’Grady, 1985), Dimension 4 was named “Emotional Insight versus Counter-Transference.”

Table 21

Stimulus Coordinates of the 4 Dimensional Therapist Intentions Solution

Therapist Intentions	Stimulus Coordinates			
	Dimensions			
	1	2	3	4
Relieve Therapist’s Needs	-.02	-1.14^a	-.85	2.17^b
Focus	-1.22^a	.23	1.30^b	-.64
Give Information	-1.52^a	.14	.89	.56
Clarify	-1.10^a	-.37	.96	-1.14^a
Self Control	.57	1.16^b	-.22	1.40^b
Change	.93	1.47^b	.22	.97
Reinforce Change	.15	1.67^b	-.30	.84
Challenge	.56	.51	-1.29^a	-1.01^a
Cognitions	.82	1.17^b	-1.32^a	-.50
Behavior	.77	1.05^b	-1.45^a	-.48
Support	.80	.53	1.53^b	-.05
Hope	.96	.09	1.50^b	.73
Set Limits	.85	-1.47^a	.05	1.00^b
Get Information	-1.65^a	-.72	.89	-.17
Resistance	.75	-1.34^a	-1.42^a	-.07
Therapeutic Relationship	.70	-1.75^a	-1.02^a	-.04
Insight	1.21^b	.57	-.33	-1.30^a
Catharsis	1.79^b	-.37	.74	-.33
Feelings	.64	-.39	.08	-1.93^a

Note. Factor loadings with absolute value of ≥ 1 are in boldface. “a” denotes negative stimulus coordinates with absolute value greater than 1; “b” denotes positive stimulus coordinates with absolute values greater than 1.

In order to index the differential levels of importance placed on the four dimensions of the current MDS solution, the student investigator examined subject weights (weirdness values) for each group (lay helper, advanced student, and senior

professional therapists) across all four dimensions. As can be seen in Table 22 advanced students placed most emphasis on Dimension 1, “Assessment/Education versus Therapeutic Work.” Senior professional therapists placed the most emphasis on Dimension 2, “Therapeutic Problems versus Therapeutic Change Processes.” Finally, lay helpers placed the most importance on Dimension 3, “Challenge versus Support.” Dimension 4, “Emotional Insight versus Counter-Transference” demonstrated no meaningful experience level preference.

Table 22

Subject Weights (Weirdness) by Dimension

Subjects	Subject Weights				
	Dimension				
	Weirdness	1	2	3	4
Lay Helpers	.11	.38	.41	.48	.34
Advanced Students	.12	.53	.45	.35	.32
Senior Professional Therapists	.06	.38	.42	.35	.34
Overall importance of each dimension		.19	.18	.16	.11

Note. Subject weights representative of the dimension relied upon the most by the three participant groups are in boldface.

Chapter 5: Discussion

This chapter discusses outcomes and limitations of the findings from the present study. In addition, implications for training, therapist development, and suggestions for future research are included.

Differences were assessed in structural knowledge and metacognitive processes by level of experience. Level of experience was found to have a significant impact on both structural knowledge and metacognitive variables. Results indicated that advanced students had significantly higher card sort scores than both lay helpers and senior professional therapists. Both senior professional therapists and advanced students sorted therapist intentions into a greater number of categories than lay helpers. Lay helpers used significantly less time to complete the card sort than both advanced students and senior professionals. Results also indicated that advanced students and experienced professional therapists reported higher knowledge of cognition scores than lay helpers. Advanced students also reported significantly higher self-reflection compared to lay helpers and experienced professional therapists. No significant experience level differences were found for regulation of cognition.

Results of the discriminant analysis indicate that four variables accurately predicted participants experience level about two-thirds of the time. Card sort score and self-reported self-reflection significantly discriminated advanced students from senior professional therapists. Knowledge of cognition and time to complete the card sort differentiated senior professional therapists from lay helpers.

Hypothesis 1a predicted that advanced students' card sort scores would be significantly higher than card sort scores for senior professional therapists whose

scores would be higher than lay helpers. Results partially supported this hypothesis. Results demonstrated a U shaped relationship between therapist experience level and card sort score. Specifically, advanced students card sort scores were significantly higher than both lay helpers and experienced professional therapists. These results suggest that advanced students compared to both lay helpers and experienced professional therapists structure their knowledge of therapist intentions in a manner more consistent with Hill and O'Grady's (1985) two dimensional five factor solution.

Advanced students superior card sort scores may result from the ill-structured nature of the card sort task. A problem structure qualifies as ill defined if any of the following components are not well specified, "a clear initial state, a set of permissible operators, and a goal state" (Chi & Glaser, 1985, p. 246). Problem structure is believed to influence individuals problem representation, and by extension, problem solution (Chi, Glaser, & Rees, 1982; Chi & Glaser, 1985). Problem representation describes the "constructed representation of a problem on the basis of individuals' domain related knowledge and its organization" (Chi et al., 1981). For example, medical experts have been found to rely on enabling conditions to activate "diagnostically salient cognitive schemas" (Koschman, Myers, Feltovich & Barrows, 1994). Senior professional therapists' problem representation and resulting card sort score may have been influenced by the absence of contextual case information. Without case information or context cues, activation of senior professional therapists' deep level knowledge structures might have been compromised.

Although the problem structure of the present study had a clear initial state; the problem was absent of a large degree of permissible operators and a well-defined

goal state. Differences in problem solvers representation and performance are even more apparent in ill-defined problems (Bedard & Chi, 1992). In the present study, participants were instructed that there is no right or wrong way to sort the items. Instructions to sort intention into a specific number of categories would have increased the degree of operators and provided a better-defined goal state, thus enhancing the problem structure.

Skovholt and Ronnestad's (1992) model of therapist professional development might also help to explain why senior professional therapist's structural knowledge scores were relatively low. Theme four of Skovholt and Ronnestad's model suggests that senior practitioners rely on "internal expertise" guided by an individually based learning method and active knowledge construction, resulting in unique and somewhat individualized knowledge structures. These concepts offer support to the implication that in the absence of a well-defined problem structure, senior professional therapist card sorts may represent highly personalized rather than widely accepted conceptualizations of how to conduct therapy.

Advanced students' superior card sort scores compared to the expert group might also reflect differential degrees of deliberate practice. Ericson, (1996) described deliberate practice as providing "tasks with an appropriate level of difficulty, informative feedback and opportunities for repetition and correction of errors (pp. 20-21)." Ericsson (1993) and colleagues (Ericsson & Charness, 1994; Ericsson, Krampe, & Tesch-Romer (1993) noted that constant attention to deliberate practice is what separates average performance from that of truly skilled professionals. Furthermore, Krampe and Charness (2006) suggested that as expert

performers reach older ages, their performance declines result primarily from the reduction of regular deliberate practice, rather than as a direct consequence of aging. In contrast, advanced students are constantly engaged in supervised clinical experiences that offer rich opportunities for learning, practice and explicit feedback. Moreover, feedback can come from a great number of sources, including supervisors, clients, peers, instructors, and the self.

Hypothesis 1b predicted that senior professionals would require significantly more time to complete the card sorting task than advanced students who would require more time than lay helpers. This hypothesis was partially supported. On average, senior professional therapists and advanced students used more time to complete the card sort than lay helpers. These findings are consistent with expertise studies that consider the role of problem structure. Bedard and Chi (1992), suggests that in solving ill-defined problems, more experienced individuals use considerably more time developing a problem representation by adding domain specific and general constraints or operators to the problem. Following this line of reasoning, the greater number of minutes used to complete the card sort by advanced students and senior professional therapists might be a result of the time taken to modify the problem from an ill-defined problem to a better defined problem (Bedard & Chi, 1992).

Hypothesis 1c predicted that senior professional therapists' card sorts would yield significantly greater number of categories than advanced students' card sorts whose would yield more categories than lay helpers card sorts. This hypothesis was partially supported. Senior professional therapists' card sorts yielded significantly

more categories than both advanced students and lay helpers. These results might be explained by the interaction between the ill-structured nature of the card sorting task and cognitive schema theory. As a result of their many years of clinical experience, senior professional therapists consider numerous cognitive structures during the problem representation phase of problem solving. Results of the present study suggest that contrived or unfamiliar problems increase the number of cognitive schemas or structures senior professional therapists consider while solving problems. Existing counseling expertise research supports the aforementioned suggestion. Martin et al. (1989) found that compared to novices, more experienced counselors used more terms to conceptualize a general counseling process; however, when the task involved conceptualizing the counseling process with a specific client, experienced counselors used fewer items to conceptualize the process.

Hypothesis 2a predicated that senior professionals would report significantly higher knowledge of cognition than advanced students who would report significantly greater knowledge of cognition than lay helpers. Results indicated that on average, both the advanced student group and experienced professional group reported significantly higher knowledge of cognition than the lay helper group. This pattern of results suggests that advanced students and experienced professionals perceive themselves to possess declarative, procedural, and conditional knowledge superior to that of lay helpers. This finding is not surprising, as lay helpers in the present study were undergraduate students, with little academic training and even less practical experience relative to advanced students and experienced professionals.

The absence of differences in knowledge of cognition between the advanced student group and experienced professional group is notable. It could be that the years of experience accumulated by advanced trainees yielded substantive metacognitive experience to allow for meaningful growth in declarative, procedural, and conditional knowledge. An alternative explanation of these findings may come from the Dunning-Kruger Effect (Kruger & Dunning, 1999), a cognitive bias in which the less skilled rate their own ability as much higher than it actually is. Furthermore, the highly skilled underrate their abilities significantly. The Dunning-Kruger effect is interpreted as a lack of metacognitive ability to recognize one's incompetence. Students, particularly those in the lowest first and second quartiles of actual performance have been found to overestimate their mastery of material and test performance (Dunning, Johnson, Ehrlinger, & Kruger, 2003; Johnson, Ehringer, & Kruger, 2003; Schraw & Dennison, 1994). As such, it is plausible that advanced students might have overestimated their knowledge of counseling and therapy. Nevertheless, because of the self-report nature of the metacognition measure in the present study and the lack of objective performance data, whether or not advanced students gave accurate assessments of their knowledge of cognition cannot be proven or disproven.

Hypothesis 2b predicted that no significant experience level differences would exist for self reported regulation of cognition. Results supported this hypothesis. The pattern of regulation of cognition scores found in the present study suggests that therapists of all experience levels plan, monitor, and evaluate their learning and goal attainment fairly equally.

Several factors might explain why no experience level differences in regulation of cognition were found. The first of these include attributes of the regulation of cognition construct and the second might be attributes of the three groups. Difficulties in reliably reporting regulation of cognition have been noted for children as well as adults (Flavell, 1985 cited in Garner & Alexander, 1989; Kreutzer, Leonard & Flavell, 1975). Regulation of cognition as measured in the present study includes factors such as monitoring, evaluation, and debugging strategies. These regulatory control strategies require flexibility, and ultimately, consideration that one might need to reevaluate what one thinks he or she knows about a therapeutic situation. One of the downfalls of experience might be increased inflexibility (Chi, 2006; Dumont, 1991). The potential for some degree of inflexibility among experienced professionals may have led to suppressed regulation of cognition self reports. Lay helpers and advanced students supervised practice experiences typically involve explicit planning, monitoring, and evaluation processes. As a result, these two participant groups may have felt confident in their endorsements of the degree to which they engage in regulation of cognition. Furthermore, the supervision of supervision many advanced students receive is also rich in opportunities for developing regulatory and control strategies. By assisting supervisees in monitoring and regulatory strategies, advanced students own regulatory strategies might be enhanced.

Hypothesis 2c predicted that advanced students would report significantly greater self-reflection than lay helpers and senior professional therapists. On average, the advanced student group reported significantly greater self-reflection than both lay

helpers and experienced professional therapists. This finding implies that in general, advanced students, relative to lay helpers and senior professional therapists prioritize the need for engagement in self reflection and perceive that they actually engage in self reflection. These results are consistent with the descriptions of the advanced student phase of Skovholt and Ronnestad's (1992) phase model of counselor and therapist professional development. Persons in the advanced student phase which underscores cognitive processes and introspection as fundamental contributors to advanced student's development. In contrast, individuals in the lay helper phase of development rely primarily on external models of how to conduct therapy, but those in the senior professionals phase tend to rely on already constructed models of conducting therapy.

The finding that advanced students reported greater self-reflection than lay helpers and senior professional therapists might be explained by advanced student's training environment. Advanced students' training environment offer rich opportunities for self-reflection. These include individual and group supervision, case conference presentations, and review of audio and video tape recordings of session. In comparison, lay helpers may feel the need to engage in self-reflection, but have may have yet acquired the content knowledge or clinical experience necessary to meaningfully engage in self-reflection. Experienced professional therapists are assumed to have acquired the content and clinical experience but may feel less of a need to engage in self-reflection, possibly because they have many years of clinical experience.

Attributes of the SRIS might also contribute to advanced student's higher reports of self-reflection. The SRIS has been found to be associated with a self ruminating type of self-reflection that advanced students might be more likely to demonstrate relative to senior professional therapists. If the SRIS is indeed positively related to an anxious type of self-reflection, senior professional therapist's lower self-reflection scores may be due to their increased self confidence.

The research question exploring what linear combination of structural knowledge indicators and metacognitive variables discriminate participants along the experience continuum yielded rich findings. Four of the six variables correctly discriminated participants into their actual experience level group 66.7% of the time. The first discriminant function discriminated the advanced students from senior professional therapists and consisted of the card sort score and self-reported self-reflection. The second discriminant function discriminated senior professionals from lay helpers and consisted of knowledge of cognition and time to complete the card sort.

Comparison of the standardized discriminant function coefficients of self-reflection (.99) and card sort score (.65) of the first discriminant function suggests that although card sort scores discriminate advanced students from senior professional therapists, self-reflection may better discriminate advanced students from senior professional therapists. Comparison of the standardized discriminant function coefficients of minutes to complete card sort (.77) and knowledge of cognition (.68) of the second function, suggests that although knowledge of cognition discriminate

senior professional therapists from lay helpers, minutes to complete the card sort might better discriminate senior professional therapists from lay helpers.

The MDS analysis of participant's card sort data served two main purposes. First MDS analysis allowed for the definition of a generic configuration of therapist intentions with quite readily interpretable dimensions. The second purpose of the MDS was to quantify the relative reliance lay helpers, advanced students and senior professional therapists place upon specific dimensions of therapist intentions relative to the exclusion of others. The four dimensions of functional space defined by MDS will be interpreted in relation to therapy process and therapist experience level; that is lay helper, advanced student or senior professional therapist group status.

Stage models of therapy process (Cashdan 1973; Carkhuff, 1969 as cited in Hill and O'Grady, 1985) imply that in the beginning of treatment, therapists focus on assessment and support followed by greater efforts to promote insight and change. The "Assessment/Education versus Therapeutic Work" dimension describes the first dimension of participants' structural knowledge of the therapy process and provides partial support for stage models of therapy process. Specifically, therapist intentions of "get information," "give information," "focus," and "clarify" were all clustered together under the Assessment/Education pole of Dimension 1. Intentions of "insight," and "catharsis" were clustered together under the Therapeutic Work pole of Dimension 1.

During the assessment-education phase of therapy; therapists get information to help gain clarity and focus about clients' problematic thoughts, feelings and behaviors. Psycho-education may involve engaging clients in the treatment decision

making process by providing information about alternate available treatments or give information about one's counseling or therapeutic style (Hill & O'Grady, 1985).

Dimension 1 appears to contrast therapist's initial focus on assessment and education with intentions related to therapeutic work of "catharsis" and "insight." Of the three participant groups, advanced students relied upon Dimension 1 the most, perhaps suggesting that advanced students conceptualize the therapy process somewhat traditionally, in a manner that prioritizes a focus on assessment, followed by initiation of therapeutic work intended to foster catharsis and insight.

Therapy Problems versus Change Process was the second dimension of participants' structural knowledge. Therapist intentions of "relieve helper's needs," "set limits," "resistance," and "therapeutic relationship" were all clustered together under the Therapy Problems pole of Dimension 2. Intentions of "self control," "change," "reinforce change," "cognitions," and "behavior" were clustered together under the Change Process pole of Dimension 1. Hill and O'Grady (1985) define the Therapy Problems cluster as involving activities that serve as obstacles to therapeutic work. "Change" is thought to consist of therapist intentions to actively help the client learn and maintain new attitudes feelings and behaviors. Dimension 2 also appears to relate to therapy process and suggests that an important aspect of the therapy process involves managing obstacles to a positive therapy process while promoting change processes of new ways of making attributions for external and internal cues, decreasing maladaptive behaviors and teaching new behaviors. Of the three participant groups, senior professional therapists relied upon Dimension 2 the most,

perhaps suggesting that of importance to senior professional therapists is management of therapy problems while promoting therapeutic change processes.

Challenge versus Support is the third dimension of participants' structural knowledge. Specifically, therapist intentions of "maladaptive behaviors," "maladaptive cognitions," "challenge," "resistance," and the "therapeutic relationship" were all clustered together under the Challenge end of Dimensions 3; similarly, intentions of "support," "hope," and "focus" were clustered together under the Support end of Dimension 3. These results suggest that challenging clients' resistance to changing maladaptive behaviors and cognitions while promoting hope, support and focus may also be of importance to the therapy process, particularly to lay helpers. Of the three participant groups, lay helpers relied upon Dimension 3 the most.

Emotional Insight versus Countertransference/Transference Management is the fourth dimension of participants' structural knowledge. The intentions that comprise the Emotional Insight pole of Dimension 4 are "feelings," "insight," "clarify," and "challenge." The intentions that comprise the Countertransference/Transference Management pole of Dimensions 4 are "relieve helper's needs," "self-control," and "set limits." Hill and O'Grady (1985) referred to the co-occurrence of feelings and insight intentions as promoting "emotional insight" (p. 16). Kivlighan (2008) concluded that expert counselors used the "feelings", "insight", and "clarify" intentions along with other intentions as a part of a complex process to further the counseling process. In the present solution "challenge" and "clarify" co-occur with "feelings" and "insight" intentions, suggesting that clarifying

the feelings and their meaning might be a challenging yet important aspect of promoting emotional insight. In contrast to promoting emotional insight, Relieving Therapist's Needs by "setting limits" and promoting clients and therapist "self control" are of primary importance to the therapy process.

Some overlap appears to exist between Dimension 3 and 4 that warrants discussion. Although these two Dimensions share intentions of "cognitions," "behaviors," "resistance," and "therapeutic relationship", Dimension 3 consists of change oriented intentions such as "change," "reinforce change," and "self-control." In some contrast, Dimension 4 consists of the additional therapist intention of "challenge." This may suggest that although both senior professional therapists and lay helpers focus on "behaviors" and "cognitions," senior professional therapists may use these intentions with an explicit interest in promoting change, perhaps a purpose not explicitly intended by lay helpers.

Limitations of the Study

There are some methodological issues to consider when interpreting of the results of this study. Methodological issues include the following: (a) the potential for sample bias, (b) the use of an online data collection method, (c) the lack of rich psychometric data of the MAI-TV and (d) the failure to assess recent therapy experience and involvement in supervision.

The use of a convenience sample of lay helpers is one potential source of sample bias that may have influenced the pattern of results. First, lay helpers were enrolled in a helping skills course in where discussion of therapist intentions might have occurred. To the degree that lay helpers discussed intentions in their

undergraduate courses they may have been more familiar than advanced students and senior professional therapists. A second potential for sample bias relates to differential incentive for participation. Although most respondents in this study responded willingly with no external reward, lay helpers were given an incentive in the form of extra credit toward their helping skills course. It is unclear what impact, if any, the extra credit had on lay helper's performance. On one hand, these participants might have completed the questionnaire and sorting task more haphazardly, simply to receive the extra credit. On the other hand, receiving extra credit could have led some students to work longer to prove to themselves that they deserved the extra credit they were to receive. That lay helpers completed the sorting task in the shortest amount of time, suggests that the former is more likely than the latter.

The online data collection procedures might have had differential impact on the card sort data. Although the websort.net user interface is simple and user friendly, it is possible that senior professional therapists might have been less comfortable with the online data collection procedures. To the degree that senior professional therapists were less comfortable with the online data collection procedures, their performance on the card sort task and subsequent structural knowledge indicators may have been negatively affected. For example, senior professional therapists were found to use more time to complete the card sort than both lay helpers and advanced students. It remains unclear to what degree the significant experience level difference in time to complete the card sort is an artifact

of differing degrees of comfort with the online data collection method, or as stated earlier, an artifact of the ill-structured nature of the card sort used in this study.

The student investigator adapted the original metacognitive instrument for use in the present study. Although the knowledge of cognition and the regulation of cognition subscales had high alpha coefficient values, other psychometric properties are unknown. Several items of the original MAI appear to have high potential for socially desirable responding and thus it is likely that the MAI-TV may be quite susceptible to desirable responding. Moreover, metacognition has been described as a fuzzy concept (Flavell, 1981). Specifically, the regulation of cognition subscale has been described as sometimes unstable (Brown, 1987), as such; it may have been difficult for participants to reliably respond to regulation of cognition items.

Another methodological limitation of the present study is the failure to assess senior professional's recent clinical experience. Although senior professional therapists possessed on average 31 years of experience, it is plausible that senior professional therapists may have accumulated much of their clinical experience at earlier points in their career. In addition, the amount of supervision and feedback received by participants is unknown. Although it might be safe to assume that trainees who participated in the present study were receiving feedback and supervision, the same cannot be confidently assumed for senior professional therapists.

Lastly, it is recognized that the present study is correlational in nature. As a result, the findings represent effects in the sample and methods used and are cautiously generalizable to actual performance of lay helpers, advanced students and

experienced professional therapists as a whole. Despite these conditions, the present study represents an initial step in the search for the knowledge and skills that distinguish lay helpers, advanced student therapists and experienced professional therapists. Because of these limitations, conclusions made from these results must be interpreted with caution.

Implications for Therapist Expertise

Therapist expertise can be thought of as the knowledge and skills that differentiate highly skilled therapy performance from less skilled therapy performance. Findings of the present study suggest that the nature of therapist expertise may be quite complex and to some degree dependent upon the structure of the specific problem or task used to study expertise. With practice, experienced therapists may develop unique or idiosyncratic knowledge structures of how to conduct therapy. For example, the senior professional therapists in the present study appear to conceptualize the therapy process relative to promoting change processes all the while managing to use the therapeutic relationship and limit setting to circumvent potential problems to the therapy progress. Advanced student on the other hand, appear to conceptualize the therapy process in a more traditional manner by placing more emphasis on assessment, both early in treatment as well as during specific sessions. Following initial assessment oriented work; advanced students may follow up with intentions to create a safe environment for clients to discuss thoughts and feelings with the goal of catharsis and insight. Lay helper's on the other hand, appear to conceptualize the therapy process in a manner that challenges clients' maladaptive behaviors and cognitions. In contrast to senior professional therapists,

lay helpers might have yet to develop awareness of and knowledge of using the therapeutic relationship as a therapeutic tool.

Although advanced students had higher card sort scores than senior professional therapists, whether or not advanced trainees can put their well organized structural knowledge to use and outperform experts in the field remain unclear. Birk and Mahalik (1994) suggested that negative cognitive, affective, and motivational states including distraction, anxiety, and confidence might compromise field-based performance of therapists in training. Advanced students may have adequate declarative and procedural knowledge but lack the necessary knowledge of when to use their knowledge. For example, senior professional therapists might possess the knowledge of therapeutic conditions that would make the experience of intense affect in therapy more or less therapeutic.

Although reflection is thought to be a prerequisite for optimal learning and professional development at all levels of experience (Ronnestad & Skovholt, 2003), results of the present study suggest that some senior professional therapists might engage in less self-reflection than advanced students. It is also possible that these senior professional therapists might engage in a different form of self-reflection. Nevertheless, given the performance deficits resulting from decreased deliberate practice, it may be important for senior professional therapists to continue to engage in self-reflection in order to manage the potential for bias that accompanies many several decades of clinical experience.

One of the potential pitfalls of expertise is the increased propensity for a number of cognitive bias and errors. Dumont (1991) outlined the liabilities of using

theoretical templates in problem solving, including confirmatory bias, or the tendency to seek validation of initial impressions. Several counselor and therapist researchers (Byers-Winston & Fouad, 2006; Morrow & Deidan, 1992; Ridgley, 1995) suggested that metacognitive strategies of planning, monitoring, and evaluating may be important in protecting against bias, errors in judgment, treatment that may result from accumulated years of clinical experience.

Implications for Training and Supervision

The present study found notable differences in structural knowledge and metacognitive processes as a function of experience level. The specific pattern of results yields several implications for training and supervision.

Assuming that training and supervision emphasizes structural knowledge and metacognitive development, it would be important to design curricula specifically intended to facilitate growth in these areas. In addition, it would be helpful to identify techniques trainers and supervisors can use to improve trainees' structural knowledge and metacognitive development. One example of a metacognitive approach to therapist training is Bennet-Levy et al. (2001) Self-Practice/Self-Reflection approach to training cognitive behavioral therapists. These authors found that cognitive therapy trainees in a university clinical psychology program reported increased self-efficacy in directing their attention towards themselves by helping them become more sensitive to their behavior, their cognitive schemata and their interactional styles. Additionally, trainees felt that this kind of self-exploration helped them to (a) communicate the conceptual framework of cognitive therapy, (b) increase their attention to the therapeutic relationship via building rapport, (c) work

collaboratively, and (d) appropriately self-disclose. Participants also showed improvement in checking their assumptions about client's readiness for change.

One of the building blocks of expertise is pattern recognition or the ability to discern and respond effectively to the most important events and experiences within a given psychotherapy session. Fauth et al. (2007) encouraged training therapists in metacognitive skills of pattern recognition and mindfulness. Fauth et al. suggest that these patterns represent potentially useful therapeutic foci that "once recognized....can guide explicit therapeutic attention to these areas" (p. 385).

Writings of early developmental theorists and cognitive scientists offer several avenues from which therapist structural knowledge and metacognitive processes might be enhanced. Peer interactions and self explanations (Chi, De Leeuw, Chiu & Lavanchar, 1994) are believed to positively impact structural knowledge and metacognitive development. Self-explanation is the process of clarifying and making more complete to oneself the content of an exercise. Several studies in cognitive science point that students who spontaneously self-explain when they study learn more (Chi et al., 1989). Moreover, self-explanations are usually more effective than explanations provided by others, because they require students to elaborate their existing knowledge. However, studies show that most students do not spontaneously engage in self-explanation and often need guidance to do it (Bielaczyc, Pirolli, & Brown, 1994) or need just to be prompted to do it (Chi et al., 1989). Interpersonal process recall procedures (Carkhuf, 1969) might provide the type of opportunities for self explanation discussed by Chi and colleagues. In addition, supervisors can help students to better plan, monitor, and evaluate their clinical work by using the "think-

a-loud” method of the cognitive sciences to demonstrate the use of metacognitive strategies. The post session discourse between supervisor and trainee that occurs during live supervision might be a medium from which trainees’ structural knowledge and metacognitive processes might be enhanced.

Suggestions for Future Research

Although informative, the research findings of the present study leave many questions. Future therapist expertise research should address the impact of structural knowledge and metacognitive processes on counseling and psychotherapy training outcomes. For example, a longitudinal study with a representative sample would provide the necessary data to more comprehensively test the assumptions of Skovholt and Ronnestad’s (1992) phase model of counselor and therapist professional development. These authors suggest that changes occur in anxiety and confidence as therapist’s progress along the experience continuum. Exploring the impact of these changes in relation to therapist expertise development is needed to more fully understand the nature and course of therapist expertise and its development.

Ultimately, therapist expertise is performance based, thus another direction for future research would be studying how laboratory measures of structural knowledge and metacognition relate to field based practices including, assessment, diagnosis, treatment planning, therapist performance and client outcome.

Although outcome studies do not support the differential effectiveness of different theories (Smith, Glass, & Miller 1980; Stiles, Shapiro & Elliot, 1986), Worthington and Dillon (2003) observed that there is “substantial evidence that counselors and therapists of different theoretical orientations exhibit different

epistemic beliefs, verbal response behavior, and specific therapeutic techniques” (p. 95). As such, how structural representations of therapy vary by theoretical orientation preference would be important to explore.

An enduring issue related to metacognition is the issue of valid and reliable measurement, particularly in relation to specific domains (Garner & Alexander, 1989; Schraw & Dennison, 1994). Empirically developing and validating a measure of therapist metacognition would be invaluable in studying the role of metacognition in therapist expertise. Empirical data to support the potential for metacognition to moderate therapist errors and biases is scant but can be tested empirically using analogue studies.

Finally, as therapists move along the experience continuum, mental models are elaborated and the connection between the given conditions and choice of intervention may become increasingly automated (Glaser, 1989; Gott, et al., 1991). These assumptions suggest that metacognitive factors might be responsible for small shifts in structural knowledge. The relations between metacognition, structural knowledge development, and expertise development are only speculative at this point and would contribute significantly to the therapist expertise literature.

Conclusion

The primary motivation for conducting this study was the premise that experience is not the only factor associated with therapist expertise development (Dawes, 1994; Martin, et al., 1989). Instead, differences in therapists’ structural knowledge and metacognitive processes are expected to coincide with differences in therapist experience level. Results indicated that significant experience level

differences do exist in structural knowledge and metacognitive processes. An inverted U relationship was found between experience level and participant's card sort scores and self reported self-reflection. Furthermore, self-reflection and card sort scores discriminate advanced students from senior professional therapists and knowledge of cognition and time to complete the card sort discriminated senior professionals from lay helpers.

MDS results indicated that as a whole, the present sample cognitively organized the therapy process along four dimensions. The first dimension includes intentions to assess client problems versus intentions to engage client's in therapeutic work. Dimension 1 was relied upon most heavily by advanced students. A second dimension of participant's structural knowledge of the therapeutic process consists of intentions around managing therapeutic problems while promoting therapeutic change and was endorsed most by senior professional therapists. The third dimension appears to be relied upon the most by lay helpers and consists of frequently used intentions regardless of one's preferred theoretical orientations versus those that traditionally, are thought to be used by persons of one theoretical orientation over another. Finally, dimension 4 identified intentions to promote emotional insight versus managing counter transference/transference reactions.

Results of the present study also suggest that therapist expertise might depend upon the type of problem or task being used to assess expertise. Whether studying therapist expertise in the laboratory or in the field, it is important to consider attributes of the type of task being used to assess therapist expertise.

Appendix A: Initial Recruitment Email

Subject: Therapist Expertise Development: Correlates of Metacognition and Structural Knowledge, Dissertation Study

Dear (Name) or (Therapist-in-Training at X University),

My name is Kevin London, and I am a doctoral candidate in the Counseling Psychology program at the University of Maryland, College Park. My dissertation research investigates expertise development as a function of counselor/therapist knowledge and metacognition.

I am writing to invite you to participate in my study. Participation would involve completing a brief instrument battery and a counselor/therapist intentions game, which can be accessed online via the URL link below (total participation time of approximately 10-20 minutes). Your participation would be extremely helpful in generating knowledge that can hopefully contribute to more effective counselor/therapist training. In addition, I hope this survey will give you an opportunity to reflect on important aspects of your training experiences.

TO ACCESS THS STUDY, PLEASE CLICK HERE:

Thank you for your consideration. This research has been approved by the University of Maryland, College Park Institutional Review Board (IRB), Approval #. Please note that by agreeing to participate in this online survey, we are assuming that you are over 18 years of age and have provided your informed consent. If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: IRB Office, University of Maryland, College Park, Maryland, 20742; (e-mail) irb@deans.umd.edu; (telephone) 301-405-0678.

Sincerely,

Kevin London, M.A.
Doctoral Student
301-314-7692
klondonumd@gmail.com

Dennis Kivlighan Jr., Ph.D.
Professor
301-405-2863
dennisk@umd.edu

Appendix B: Web Survey Introductory Page and Eligibility Requirements

Welcome to my Counseling Knowledge and Skills Study

I greatly appreciate your participation in my dissertation research. Please allow 20-30 minutes to complete the survey and task in one sitting. Please proceed to the next page to read the eligibility requirements. ***Participant clicks “Next” to proceed and is taken to the “Eligibility page”.*

Eligibility to Participate in this Study

Eligibility to participate in this study requires you to meet ONE of the following criteria:

- 1) you must be enrolled in either Psychology 433 or EDCP 310 at the University of Maryland
- 2) you must be a trainee or intern in a doctoral program in one of the mental health professions (e.g., counseling psychology, clinical psychology)
- 3) you must be a member of the American Board of Professional Psychology

Please indicate which of these criteria you meet.

- ☐ Psychology 433 or EDCP 310 student
- ☐ Trainee or Intern
- ☐ American Board of Professional Psychology Member
- ☐ Neither of the above

Clicking “PSYCHOLOGY 433/EDCP 310 STUDENT,” “TRAINEE or INTERN” or “AMERICAN BOARD of PROFESSIONAL PSYCHOLOGY MEMBER” takes participants to the Informed Consent page see Appendix B; “Clicking”None takes participants to the following page explaining why they were not eligible to participate in study:

Thank you for your consideration of my study!

My study is about the experiences of novice therapists-in-training, advanced graduate level clinicians and highly skilled therapists. Your response indicated that you did not meet either of these criteria, so you are not eligible to participate at this time. If you have any questions about my study, please contact either Dr. Dennis Kivlighan Jr., (Counseling and Personnel Services Department, University of Maryland, College Park, B0100H Cole Field House, College Park, MD 20742; phone: 301-405-2863; email: dennisk@umd.edu) or Mr. Kevin London (Counseling and Personnel Services Department, University of Maryland, College Park, 0104 Shoemaker Building, College Park, MD 20742; phone: 301-314-7692; email: klondonumd@gmail.com).

If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: Institutional Review Board Office,

University of Maryland, College Park, Maryland, 20742; (e-mail)
irb@deans.umd.edu; (telephone) 301-405-0678.

***At the end of Demographic Questionnaire, clicking "Next" takes participants to the following last page of the survey:*

THANK YOU FOR YOUR PARTICIPATION

I greatly appreciate the time you took to participate in my study! Your participation will help generate knowledge about the processes used by supervisors to focus on their supervisees' strengths and deficits, which may one day be used to inform more effective supervisory practices.

If you would like to be emailed a summary of the results of this research, please provide your email in the space below. Your email address will be kept separate from the rest of your data.

Appendix C: Informed Consent Form

Please read the Informed Consent below. After reading the Informed Consent, please provide your electronic signature, and then click one of the two boxes at the bottom of the page to indicate whether you agree to participate in this research.

INFORMED CONSENT FOR PARTICIPATION IN THIS STUDY

PROJECT TITLE

Therapist Expertise: Correlates of Structural knowledge and Metacognition

WHY IS THIS RESEARCH BEING DONE?

This is a research project being conducted by Dr. Dennis Kivlighan Jr., and Mr. Kevin London at the University of Maryland, College Park. We are inviting you to participate in this research project because you are a novice therapist-in-training or an advanced graduate trainee. The purpose of this research project is to investigate the relationship between Metacognition, Structural knowledge and Expertise. By examining the relationship between these two variables, perhaps we can better help trainees to regulate their counseling knowledge, skills and experiences in a way that facilitates structural knowledge development.

WHAT WILL I BE ASKED TO DO?

The procedures involve completing a series of measures via an online survey, in which you will respond to questions about yourself as a trainee. Questions from the survey will be in Likert scale format (e.g., rating on a scale where 1 = strongly disagree and 5 = strongly agree). An example item is "I reevaluated my assumptions about my client when I became confused." You will also be asked to complete a conceptual mapping task. Participation in this study involves completion of the entire survey and mapping task in one sitting in any location where you have internet access, will require a 20-30 minute time commitment.

WHAT ABOUT CONFIDENTIALITY?

We will do our best to keep your personal information confidential. To help protect your confidentiality, (1) your name will not be included on the surveys and other collected data; (2) a four-digit code will be placed on the survey and other collected data; (3) through the use of an identification key, the researcher will be able to link your survey to your identity; and (4) only the researcher will have access to the identification key. Data will then be saved in a password-protected file on the student investigator's computer. Only the student investigator will know the password, thus ensuring that other individuals do not have access to data. In addition, when reporting the results of this study, only aggregate data will be reported. If we write a report or article about this research project, your identity will be protected to the maximum extent possible. Your information may be shared with representatives of the University of Maryland, College Park or governmental authorities if you or someone else is in danger or if we are required to do so by law.

One limitation inherent in internet research such as this study is that confidentiality CANNOT be completely guaranteed; in electronic submissions, there is always a small chance that information could be intercepted and read by a third party. However, given the focused nature of participant recruitment for this study (i.e., the study will not be widely advertised) and the probably limited value of the data to a third party, it seems unlikely that this data will be a target for interception.

WHAT ARE THE RISKS OF THIS RESEARCH?

There may be some risks from participating in this research study. You may experience slight discomfort when asked to reflect on your experiences in training or working as a counselor/therapist. However, this possible discomfort may be beneficial, as reflecting on your training experiences is an important part of your professional development.

WHAT ARE THE BENEFITS OF THIS RESEARCH?

This research is not designed to help you personally, but the results may help the investigator learn more about how counselor/therapists and trainees structure knowledge and skills and make meaning of their clinical experiences so that, in time, we can gain a better understanding of counselor/therapist expertise performance. We hope that, in the future, other people might benefit from this study through improved understanding of training counselor/therapist in knowledge and skills consistent with expertise in the domain of counseling/therapy.

DO I HAVE TO BE IN THIS RESEARCH? MAY I STOP PARTICIPATING AT ANY TIME?

Your participation in this research is voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

IS ANY MEDICAL TREATMENT AVAILABLE IF I AM INJURED?

The University of Maryland does not provide any medical, hospitalization or other insurance for participants in this research study, nor will the University of Maryland provide any medical treatment or compensation for any injury sustained as a result of participation in this research study, except as required by law.

WHAT IF I HAVE QUESTIONS?

This research is being conducted by Dr. Dennis Kivlighan Jr., and Mr. Kevin London at the University of Maryland, College Park. If you have any questions about the research study itself, please contact either Dr. Dennis Kivlighan Jr., (Counseling and Personnel Services Department, University of Maryland, College Park, B0100H Cole Field House, College Park, MD 20742; phone: 301-405-2863; email: dennisk@umd.edu) or Mr. Kevin London (Counseling and Personnel Services Department, University of Maryland, College Park, 0104 Shoemaker Building, College Park, MD 20742; phone: 301-314-7692; email: klondonumd@gmail.com).

If you have questions about your rights as a research subject or wish to report a

research-related injury, please contact: Institutional Review Board Office, University of Maryland, College Park, Maryland, 20742;
(e-mail) irb@deans.umd.edu; (telephone) 301-405-0678

STATEMENT OF AGE OF SUBJECT AND CONSENT [Please note: Parental consent always needed for minors.]

Your electronic signature (typing in your name below) indicates that:
you are at least 18 years of age,
the research has been explained to you;
your questions have been fully answered; and
you freely and voluntarily choose to participate in this research project.
Your name will be kept separate from the rest of your data.

Name: _____

Date: _____

Please click below to indicate whether you agree or do not agree to participate in this research.

☐ Yes, I agree to participate

☐ No, I do not agree to participate

Appendix D: Metacognitive Awareness Inventory-Therapist Form.

Please read each item carefully and indicate the extent to which you agree (or disagree) with each of the statements listed below using the following scale:					
① = Strongly Disagree ② = Disagree ③ = Neutral ④ = Agree ⑤ Strongly Agree					
Regulation of Cognition	SD	D	N	A	SA
6. I think about what I really need to learn about my client before I begin a session. (P)	①	②	③	④	⑤
8. I set specific goals before I begin a session (P)	①	②	③	④	⑤
22. I ask myself questions about the client before I begin a session (P)	①	②	③	④	⑤
23. I think of several ways to approach my clients' problem(s) and choose the best one (P)	①	②	③	④	⑤
42. I consider supervisor, teacher, or peer recommendations before I begin a session (P)	①	②	③	④	⑤
45. I organize my time to best accomplish session goals (P)	①	②	③	④	⑤
1. I ask myself periodically if I am meeting my session goals. (M)	①	②	③	④	⑤
2. I consider several alternatives to my clients' problem before I respond (M)	①	②	③	④	⑤
34. I find myself pausing regularly to check my comprehension of my clients' disclosures (M)	①	②	③	④	⑤
11. I ask myself if I have considered all options when helping a client to solve a problem (M)	①	②	③	④	⑤
21. I periodically review session notes or tapes to help me understand important relationships among things my clients bring up (M)	①	②	③	④	⑤
28. I find myself analyzing the usefulness of therapy strategies while reviewing session notes or tapes (M)	①	②	③	④	⑤
49. I ask myself questions about how well I am doing while I am working with an unfamiliar client (M)	①	②	③	④	⑤
25. I ask others for help when I don't understand something about my client's (DS)	①	②	③	④	⑤
40. I change strategies when I fail to understand something about my client's (DS)	①	②	③	④	⑤
44. I reevaluate my assumptions about my clients when I get confused (DS)	①	②	③	④	⑤
51. I stop and go back over new client information that was not clear (DS)	①	②	③	④	⑤
52. I stop and review session notes or tapes when I feel confused (DS)	①	②	③	④	⑤
7. I know how well I did once I finish a session. (E)	①	②	③	④	⑤
19. I ask myself if there was a different way to do things after I finish a session (E)	①	②	③	④	⑤
36. I ask myself how well I accomplished my goals once I'm finished a session (E)	①	②	③	④	⑤
38. I ask myself if I have considered all options after helping my client's solve a problem (E)	①	②	③	④	⑤
24. I summarize what I learned after I finish a session (E)	①	②	③	④	⑤
50. I ask myself if I accomplished as much as I could have once I finish a sessions (E)	①	②	③	④	⑤
9. I slow down when I encounter important things about my clients (IMS).	①	②	③	④	⑤

13. I consciously focus my attention on important client information (IMS)	① ② ③ ④ ⑤
31. I create my own examples to make client information more meaningful (IMS)	① ② ③ ④ ⑤
48. I focus on the overall meaning rather than specifics of what my clients' say (IMS)	① ② ③ ④ ⑤
37. I create mental pictures or diagrams to help me understand during sessions (IMS)	① ② ③ ④ ⑤
30 I focus on the meaning and significance of new client information (IMS)	① ② ③ ④ ⑤
47. I try to break therapy down into smaller steps. (IMS)	① ② ③ ④ ⑤
43. I ask myself if what I'm hearing from my client is related to what I already know (IMS)	① ② ③ ④ ⑤
39. I try to translate new client information into my own words (IMS)	① ② ③ ④ ⑤
4. I pace myself during sessions in order to have enough time. (P)	① ② ③ ④ ⑤
41. I use an organizational structure of therapy to help manage client information (IMS)	① ② ③ ④ ⑤

Please read each item carefully and answer the extent to which you agree (or disagree) with each of the statements listed below using the following scale:							
①	Strongly Disagree	SD					
②	Disagree	D					
③	Neutral	N					
④	Agree	A					
⑤	Strongly Agree	SA					
Knowledge of Cognition			SD	D	N	A	SA
5. I understand my therapy strengths and weaknesses (DK)			①	②	③	④	⑤
12. I am good at organizing client information (DK)			①	②	③	④	⑤
17. I am good at remembering client information (DK)			①	②	③	④	⑤
3. I try to use therapy strategies that have worked with clients' in the past (PK)			①	②	③	④	⑤
14. I have a specific purpose for each therapy strategy I use (PK)			①	②	③	④	⑤
15. I work best when I know something about my client's presenting problem (CK)			①	②	③	④	⑤
32. I am a good judge of how well I understand therapy (DK)			①	②	③	④	⑤
16. I know what my supervisors or colleagues expect me to learn about myself (DK)			①	②	③	④	⑤
18. I use different therapy strategies depending on the situation (CK)			①	②	③	④	⑤
20. I have control over how well I deliver my therapy strategies (DK)			①	②	③	④	⑤
26. I can motivate myself to use a specific therapy strategy when I need to (CK)			①	②	③	④	⑤
27. I am aware of what therapy strategies I use when I do therapy (PK)			①	②	③	④	⑤
29. I use my intellectual strengths to compensate for my therapeutic weaknesses (CK)			①	②	③	④	⑤
33. I find myself using helpful therapy strategies automatically (PK)			①	②	③	④	⑤
1. I know when each strategy I use will be most effective (CK)			①	②	③	④	⑤
46. I learn more about a client when I am interested in him or her (DK)			①	②	③	④	⑤
10. I know what kind of information is most important to learn about my clients. (DK)			①	②	③	④	⑤

Appendix E. List of Therapist Intentions

1. Set Limits
2. Get Information
3. Give Information
4. Support
5. Focus
6. Clarify
7. Instill Hope
8. Encourage Catharsis
9. Identify Maladaptive Cognitions
10. Identify Maladaptive Behaviors
11. Encourage Self Control
12. Identify and Intensify Feelings
13. Promote Insight
14. Promote Change
15. Reinforce Change
16. Deal with Resistance
17. Challenge
18. Deal with the Therapeutic Relationship
19. Relieve Therapist's Needs

Appendix F. List of Changes Made to Convert the MAI to the MAI-TF

1. Added “session”
2. Replaced “a problem” with “my clients’ problem” and replaced answer with respond
3. Added “therapy” and “with clients”
4. Replaced “while learning” with “during sessions”
5. Replaced “intellectual” with “therapy”
6. Added “about my client” and replaced “task” with “a session”
7. Replaced “a test” with “a session”
8. Replaced “a task” with “a session”
9. Added “about my client”
10. Added “about my client”
11. Replaced “when solving a problem” with “helping a client to solve a problem”
12. Added “client”
13. Added “client”
14. Added “therapy”
15. Replace “learn” with “work” and replace “the topic” with “my client’s presenting problem”
16. Replace “teacher” with “supervisor, peers” and added “about myself”
17. Added “client”
18. Replaced “learning” with “therapy”
19. Replaced “easier” with “different” and replaced “task” with “session”
20. Replaced “learn” with “deliver my therapeutic strategies”
21. Added “session tapes and notes” and added “among things my clients bring up”
22. Replaced “material” with “case” and added “a session”
23. Replace “solve a problem” with “approach a problem”
24. Added “a session”
25. Added “about my clients”
26. Replaced “learn” with “use a specific therapy strategy”
27. Replaced “study” with “am doing therapy”
28. Added “therapy” and replaced “I study” with “reviewing notes or tapes”
29. Added “therapeutic”
30. Added “client”
31. Added “client”
32. Replaced “something” with “therapy”
33. Replaced “learning” with “therapy”
34. Added “of my clients’ disclosures”
35. Added “therapy”
36. Added “a session”
37. Replaced “draw” with “create” and Added “mental” and replaced “learning” with “during sessions”
38. Replaced “I solve a problem” with “helping my clients’ solve a problem”
39. Added “client”
40. Added “something about my clients”

41. Replaced “text” with “therapy” and replaced “learn” with “manage client information”
42. Replaced “a task” with “a session”
43. Replaced “what I’m reading” with “what I’m hearing” and added “from my client”
44. Added “about my client”
45. Replaced “my goals” with “session goals”
46. Added “about my client” and replaced “topic” with “him/her”.
47. Replaced “studying” with therapy
48. Added “of what my clients say”
49. Replaced “learning something new” with “working with an unfamiliar client”
50. Replaced “learned as much as I could have” with “accomplished as much as I could have” and replaced “task” with “session”
51. Added “client”
52. Replaced “reread” with “review” and added notes or tapes”

Appendix G. Self-reflection and Insight Scales

Thinking about after your session, please read each item carefully and answer **the extent to which you agree (or disagree) with each of the statements listed below** using the following scale:

- | | | |
|---|-------------------|----|
| ① | Strongly Disagree | SD |
| ② | Disagree | D |
| ③ | Neutral | N |
| ④ | Agree | A |
| ⑤ | Strongly Agree | SA |

After Sessions I.....

I don't often think about my thoughts	①	②	③	④	⑤
I rarely spend time in reflection	①	②	③	④	⑤
I frequently examine my feelings	①	②	③	④	⑤
I don't really think about why I behaved in the way that I did	①	②	③	④	⑤
I frequently take time to reflect on my thoughts	①	②	③	④	⑤
I often think about the way I feel about things	①	②	③	④	⑤
I am not really interested in analyzing my behavior	①	②	③	④	⑤
It is important for me to evaluate the things that I do	①	②	③	④	⑤
I am very interested in examining what I think about	①	②	③	④	⑤
It is important to me to try to understand what my feelings mean	①	②	③	④	⑤
I have a definite need to understand the way that my mind works	①	②	③	④	⑤
It is important to me to be able to understand how my thoughts arise	①	②	③	④	⑤

Please read each item carefully and answer **the extent to which you agree (or disagree) with each of the statements listed below** using the following scale:

- | | | |
|---|-------------------|----|
| ① | Strongly Disagree | SD |
| ② | Disagree | D |
| ③ | Neutral | N |
| ④ | Agree | A |
| ⑤ | Strongly Agree | SA |

I am usually aware of my thoughts	①	②	③	④	⑤
I'm often confused about the way that I really feel about things	①	②	③	④	⑤
I usually have a very clear idea about why I've behaved in a certain way	①	②	③	④	⑤
I'm often aware that I'm having a feeling, but I often don't quite know what it is	①	②	③	④	⑤
My behavior often puzzles me	①	②	③	④	⑤
Thinking about my thoughts make me more confused	①	②	③	④	⑤
Often I find it difficult to make sense of the way I feel about things	①	②	③	④	⑤
I usually know why I feel the way I do	①	②	③	④	⑤

APPENDIX H. Theoretical Orientation Preference Scale-Revised

<p>Directions:</p> <p>On a scale of 1 to 5, where 1 is "low" and 5 is "high," please rate how closely you believe in and adhere to each of the following theoretical orientations.</p>	
1. I identify myself as psychoanalytic or psychodynamic in orientation	Low High
2. I conceptualize my clients from a psychoanalytic or psychodynamic perspective	① ② ③ ④ ⑤
3. I utilize psychoanalytic or psychodynamic methods	① ② ③ ④ ⑤
4. I identify myself as existential in orientation	① ② ③ ④ ⑤
5. I conceptualize my clients from an existential perspective	① ② ③ ④ ⑤
6. I utilize existential methods	① ② ③ ④ ⑤
7. I identify myself as cognitive or behavioral in orientation	① ② ③ ④ ⑤
8. I conceptualize my clients from a cognitive or behavioral perspective	① ② ③ ④ ⑤
9. I utilize cognitive or behavioral methods	① ② ③ ④ ⑤
10. I identify myself as family systems in orientation	① ② ③ ④ ⑤
11. I conceptualize my clients from a family systems perspective	① ② ③ ④ ⑤
12. I utilize family systems methods	① ② ③ ④ ⑤
13. I identify myself as feminist in orientation	① ② ③ ④ ⑤
14. I conceptualize my clients from a feminist perspective	① ② ③ ④ ⑤
15. I utilize feminist therapy techniques	① ② ③ ④ ⑤
16. I identify myself as multicultural in orientation	① ② ③ ④ ⑤
17. I conceptualize my clients from a multicultural perspective.	① ② ③ ④ ⑤
18. I utilize multicultural therapy techniques	① ② ③ ④ ⑤

APPENDIX I. Demographic Questionnaire

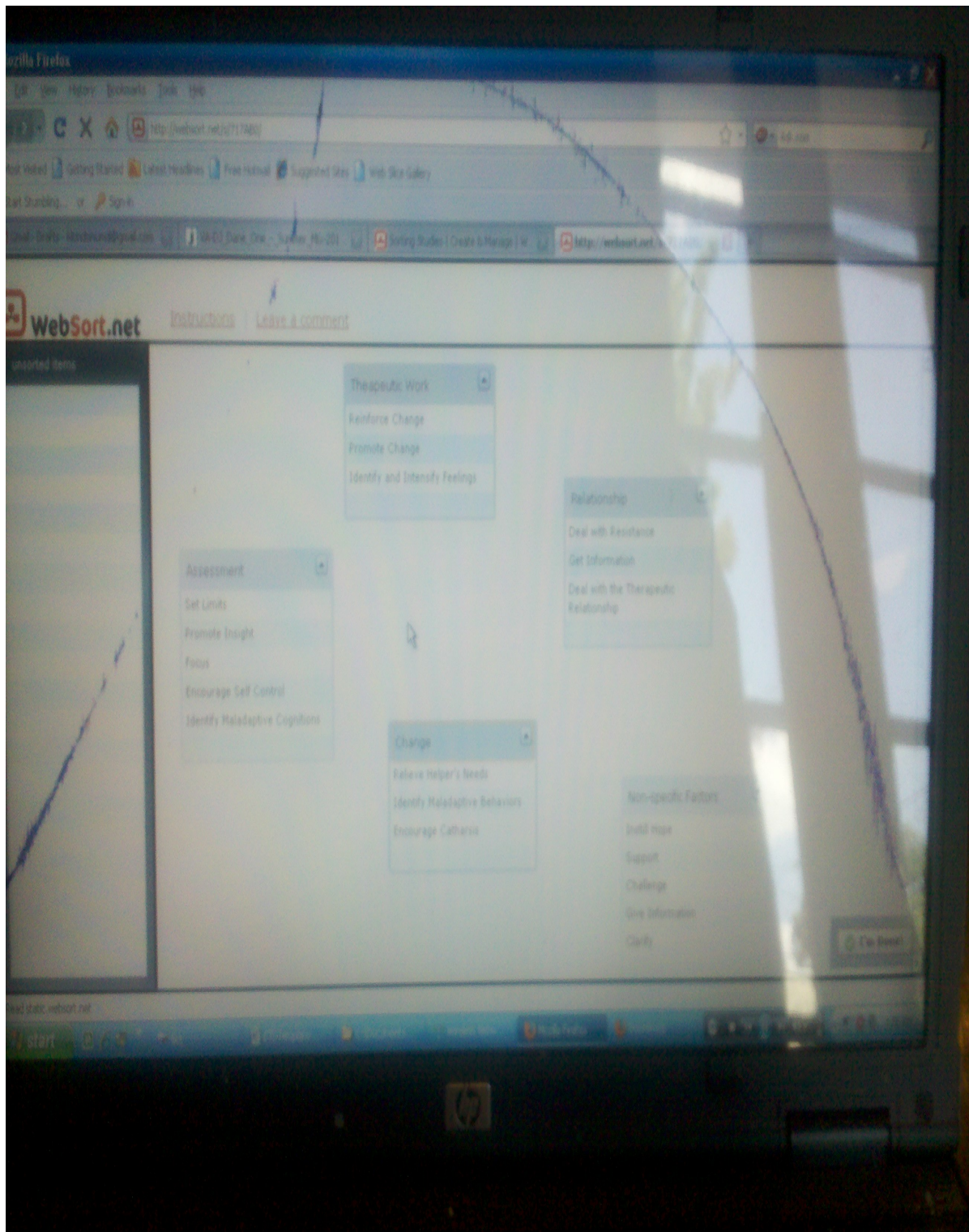
INSTRUCTIONS: Please complete the following items, either by clicking on your choice, or by typing in responses where appropriate.

- 1) Gender: ☐ Female
☐ Male
☐ Other (please specify)
- 2) Age: _____
- 3) Race/Ethnicity:

<input type="checkbox"/> African-American	<input type="checkbox"/> European-American
<input type="checkbox"/> Asian/Pacific Islander	<input type="checkbox"/> Hispanic/Latino
<input type="checkbox"/> Native American	<input type="checkbox"/> Middle Eastern
<input type="checkbox"/> Biracial/multiracial	<input type="checkbox"/> Other (Specify: _____)
- 4) Please indicate the type of program you are currently enrolled.
☐ Counseling Psychology Ph.D. program
☐ Clinical Psychology Ph.D. program
☐ Clinical Psychology Psy.D. program
☐ College Student Personnel Ph.D. program
☐ Psychology Major (Undergraduate)
☐ Other (please specify)
☐ N/A
- 5) What year of your program are you in?

<input type="checkbox"/> 1 st year	<input type="checkbox"/> 5 th year
<input type="checkbox"/> 2 nd year	<input type="checkbox"/> 6 th year
<input type="checkbox"/> 3 rd year	<input type="checkbox"/> 7 th + year
<input type="checkbox"/> 4 th year	
- 6) Of which professional field are you a licensed member?
☐ Psychologist
☐ Social Work
☐ Counseling
☐ Other: _____
- 7) How many years of experience as a counselor or therapist do you have? _____ years

APPENDIX J. WEBSORT.NET CARD SORT USER INTERFACE



APPENDIX K. CARD SORT SCORE SYNTAX

TITLE ANALYSIS FOR K. LONDON DATA MANAGEMENT, SPRG 2010--
RUN03D.

GET FILE='C:\KEVIN LONDON\SORTEXP1B.SAV'.

/*****

/** FILE SORT **/

/*****

SORT CASES BY IDENT NREC(D).

/*****

/** **/

/** INITIALIZING TOTAL 'POSSIBLE' SCORE **/

/** FOR EACH CARD SORT CLUSTTER. **/

/** **/

/*****

/*****

/** MATCH TOTALS **/

/*****

COMPUTE CLUSTSA = 0.

COMPUTE CLUSTTN = 0.

COMPUTE CLUSTCH = 0.

COMPUTE CLUSTRP = 0.

COMPUTE CLUSTNF = 0.

/*****

/** MATCH SCORES **/

/*****

COMPUTE TCLUSTSA = 0.

COMPUTE TCLUSTTN = 0.

COMPUTE TCLUSTCH = 0.

COMPUTE TCLUSTRP = 0.

COMPUTE TCLUSTNF = 0.

/*****

/** SUPPORT ASSESMENT CLUSTER **/

/** KEY IS: ITEM2 **/

/*****

/*****

/** MATCHING **/

/*****

IF (ITEM2 = ITEM2) CLUSTSA = CLUSTSA + 1.

IF (ITEM2 = ITEM5) CLUSTSA = CLUSTSA + 1.

IF (ITEM2 = ITEM6) CLUSTSA = CLUSTSA + 1.

/*****

/** SCORE **/

/** DIVIDEND **/

/*****

IF (NCLUS EQ 1) TCLUSTSA = CLUSTSA * 1.

IF (NCLUS EQ 2) TCLUSTSA = CLUSTSA * 2.

```

IF (NCLUS EQ 3) TCLUS TSA = CLUSTSA * 3.
IF (NCLUS EQ 4) TCLUS TSA = CLUSTSA * 4.
IF (NCLUS EQ 5) TCLUS TSA = CLUSTSA * 5.
IF (NCLUS EQ 6) TCLUS TSA = CLUSTSA * 4.
IF (NCLUS EQ 7) TCLUS TSA = CLUSTSA * 3.
IF (NCLUS EQ 8) TCLUS TSA = CLUSTSA * 2.
IF (NCLUS GE 9) TCLUS TSA = CLUSTSA * 1.
/*****/
/** THERAPEUTIC WORK **/
/** KEY IS: ITEM9 **/
/*****/
/*****/
/** MATCHING **/
/*****/
IF (ITEM9 = ITEM9) CLUSTTN = CLUSTTN + 1.
IF (ITEM9 = ITEM10) CLUSTTN = CLUSTTN + 1.
IF (ITEM9 = ITEM11) CLUSTTN = CLUSTTN + 1.
IF (ITEM9 = ITEM12) CLUSTTN = CLUSTTN + 1.
IF (ITEM9 = ITEM13) CLUSTTN = CLUSTTN + 1.
/*****/
/** SCORE **/
/** DIVIDEND **/
/*****/
IF (NCLUS EQ 1) TCLUS TTN = CLUSTTN * 1.
IF (NCLUS EQ 2) TCLUS TTN = CLUSTTN * 2.
IF (NCLUS EQ 3) TCLUS TTN = CLUSTTN * 3.
IF (NCLUS EQ 4) TCLUS TTN = CLUSTTN * 4.
IF (NCLUS EQ 5) TCLUS TTN = CLUSTTN * 5.
IF (NCLUS EQ 6) TCLUS TTN = CLUSTTN * 4.
IF (NCLUS EQ 7) TCLUS TTN = CLUSTTN * 3.
IF (NCLUS EQ 8) TCLUS TTN = CLUSTTN * 2.
IF (NCLUS GE 9) TCLUS TTN = CLUSTTN * 1.
/*****/
/** CHANGE **/
/** KEY IS: ITEM14 **/
/*****/
/*****/
/** MATCHING **/
/*****/
IF (ITEM14 = ITEM14) CLUSTCH = CLUSTCH + 1.
IF (ITEM14 = ITEM15) CLUSTCH = CLUSTCH + 1.
/*****/
/** SCORE **/
/** DIVIDEND **/
/*****/
IF (NCLUS EQ 1) TCLUS TCH = CLUSTCH * 1.
IF (NCLUS EQ 2) TCLUS TCH = CLUSTCH * 2.

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IF (NCLUS EQ 3) TCLUDSTCH = CLUSTCH * 3.
IF (NCLUS EQ 4) TCLUDSTCH = CLUSTCH * 4.
IF (NCLUS EQ 5) TCLUDSTCH = CLUSTCH * 5.
IF (NCLUS EQ 6) TCLUDSTCH = CLUSTCH * 4.
IF (NCLUS EQ 7) TCLUDSTCH = CLUSTCH * 3.
IF (NCLUS EQ 8) TCLUDSTCH = CLUSTCH * 2.
IF (NCLUS GE 9) TCLUDSTCH = CLUSTCH * 1.
/*****/
/** RELATIONSHIP PROBLEMS **/
/** KEY IS: ITEM1 **/
/*****/
/*****/
/** MATCHING **/
/*****/
IF (ITEM1 = ITEM1) CLUSTRP = CLUSTRP + 1.
IF (ITEM1 = ITEM3) CLUSTRP = CLUSTRP + 1.
IF (ITEM1 = ITEM16) CLUSTRP = CLUSTRP + 1.
IF (ITEM1 = ITEM19) CLUSTRP = CLUSTRP + 1.
/*****/
/** SCORE **/
/** DIVIDEND **/
/*****/
IF (NCLUS EQ 1) TCLUDSTRP = CLUSTRP * 1.
IF (NCLUS EQ 2) TCLUDSTRP = CLUSTRP * 2.
IF (NCLUS EQ 3) TCLUDSTRP = CLUSTRP * 3.
IF (NCLUS EQ 4) TCLUDSTRP = CLUSTRP * 4.
IF (NCLUS EQ 5) TCLUDSTRP = CLUSTRP * 5.
IF (NCLUS EQ 6) TCLUDSTRP = CLUSTRP * 4.
IF (NCLUS EQ 7) TCLUDSTRP = CLUSTRP * 3.
IF (NCLUS EQ 8) TCLUDSTRP = CLUSTRP * 2.
IF (NCLUS GE 9) TCLUDSTRP = CLUSTRP * 1.
/*****/
/** NON-SPECIFIC FACTORS **/
/** KEY IS: ITEM4 **/
/*****/
/*****/
/** MATCHING **/
/*****/
IF (ITEM4 = ITEM4) CLUSTNF = CLUSTNF + 1.
IF (ITEM4 = ITEM7) CLUSTNF = CLUSTNF + 1.
IF (ITEM4 = ITEM8) CLUSTNF = CLUSTNF + 1.
IF (ITEM4 = ITEM17) CLUSTNF = CLUSTNF + 1.
IF (ITEM4 = ITEM18) CLUSTNF = CLUSTNF + 1.
/*****/
/** SCORE **/
/** DIVIDEND **/
/*****/

```

```

IF (NCLUS EQ 1) TCLUSTNF = CLUSTNF * 1.
IF (NCLUS EQ 2) TCLUSTNF = CLUSTNF * 2.
IF (NCLUS EQ 3) TCLUSTNF = CLUSTNF * 3.
IF (NCLUS EQ 4) TCLUSTNF = CLUSTNF * 4.
IF (NCLUS EQ 5) TCLUSTNF = CLUSTNF * 5.
IF (NCLUS EQ 6) TCLUSTNF = CLUSTNF * 4.
IF (NCLUS EQ 7) TCLUSTNF = CLUSTNF * 3.
IF (NCLUS EQ 8) TCLUSTNF = CLUSTNF * 2.
IF (NCLUS GE 9) TCLUSTNF = CLUSTNF * 1.
/*****
*/
/** **/
/** THE PREVIOUS CODE CREATES SUMMARY VARIABLES THAT **/
/** REFLECT MATCHING AND SCORING OF CARD SORT WITH **/
/** STANDARD ESTABLISHED BY DR. CLARA HILL. **/
/** **/
/*****
*/
/*****
/** SINGLE CASE AND ALL VARIABLES **/
/** ARE SAVED TO NEW SYSTEM FILE. **/
/*****
/
COMPUTE KEEP = 0.
IF ($CASENUM EQ 1) KEEP = 1.
IF (IDENT NE LAG(IDENT,1)) KEEP = 1.
SELECT IF (KEEP = 1).
SAVE OUTFILE='C:\KEVIN LONDON\SORTEXP1C.SAV'
/DROP=IDOLD,SRTITEM.
/*****
/** PROCESS **/
/** END **/
/*****

```

EXECUTE.

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