

LEARNING THE PROBLEM-SOLVING PROCESS  
THROUGH CONSULTATION

by

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## ABSTRACT

Theories of school-based consultation posit that by using consultative services to resolve a difficult problem, the consultee will gain the ability to solve similar problems in the future. This study sought to examine if exposing participants to the consultation process results in increased understanding of the problem-solving process as well as higher scores on a measure of problem-solving orientation. Participants ( $N = 207$ ) were randomly assigned to watch a video of a consultant and consultee using the consultation process to resolve a problem, a lecture style voice-over PowerPoint reviewing the steps of the problem-solving process, or a video of two individuals discussing a problem with components of neither the consultative, nor the problem-solving process included. The results of an omnibus  $F$  test revealed a statistically significant result across conditions on a measure of participants' understanding of the problem-solving process; however, post-hoc analyses were not statistically significant. No statistically significant effects were noted on a measure of problem-solving orientation. Implications of these findings are considered.

Key words: consultation, consultation outcomes, knowledge transfer, transfer of the problem-solving process, problem-solving process, social problem-solving process.

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## **Chapter 1: Introduction**

The services that school psychologists provide are broadly defined as direct and indirect services. Direct services include counseling, assessment, and implementation of direct behavioral modification programs school psychologist provide directly to students (National Association of School Psychologists [NASP], 2010a). Indirect services include behavioral or academic intervention plans, delivered through collaborative or consultative services to parents and educators who interact directly with the child (Bergan, 1995; Bronfenbrenner, 1977; Brown & Schulte, 1987; Carlson & Tombari, 1986; Gutkin & Curtis, 2008; Reddy, Barboza-Whitehead, & Files, 2000).

Time constraints resulting from excessive workloads assigned to school psychologists result in reduced availability to deliver direct services. In order to meet job demands and provide necessary services, the National Association of School Psychologists (NASP) recommends a ratio of school psychologist to students of approximately 1:500-700 (National Association of School Psychologists [NASP] 2010a). Despite NASP's recommendation, practitioners report caseloads ranging from 1:500 to 1:3000, with a modal response of 1:1500 reported (Bramlett, Murphy, Johnson, Wallingsford, & Hall, 2002). Providing quality services with such high caseloads is demonstrably difficult for both novice and experienced school psychologists alike. For example, assuming that school psychologists provide direct services to approximately 10% of their caseload, then using the median reported caseload (1500 students) school psychologists should expect to allocate approximately 16-minutes of direct service for each of the 150 students during a traditional 40-hour workweek. Under this example scenario, time is not allocated for other common responsibilities expected of school psychologists such as completing initial evaluations, writing reports, or attending meetings.

Assuming that a school psychologist is able to meet service demands, then the question of where services are provided must be considered. If the school psychologist provides services outside of the child's classroom, then the student is deprived of the academic content covered during that time and must catch-up after returning to class. More efficient methods of service delivery are required if the service provider, in this case the school psychologist, wishes to provide meaningful and efficient services (Caplan, 1970). As a result of this problem, school psychologists use consultation services. Consultation is an indirect problem-solving service where those with specialized expertise, school psychologists in this instance, work with one or more persons (e.g., parents or teachers) to resolve a problem presented by a child or student (Gallessich, 1985; Sheridan, Welch, & Orme, 1996). Consultation services consist of the consultant, the consultee; and the child (Bergan & Kratochwill, 1990; Gallessich, 1985; Lee & Niileksela, 2014; Sheridan et al., 1996; Tharp & Wetzel, 1970). This triad represents the tripartite model of consultation which is represented in Figure 1. In this model, the consultant is the school psychologist and holds mental health and behavioral expertise and works directly with the consultee—most often a teacher or group of teachers. The consultee is the individual who has direct contact with the child and is responsible for implementing the interventions designed to meet the child's needs. Finally, the child is the student whose behavior the consultant and consultee have targeted for change. Several models of consultation exist within school psychology (Gallessich, 1985; Sheridan et al., 1996).

The consultation approach contains two key assumptions; the first assumption states that consultees benefit from the consultation process by resolving an immediate problem (Albee, 1968; Alpert, 1976; Gutkin & Curtis, 2008; Lee & Niileksela, 2014; Macklem & Kalinsky, 2000; Sugai & Tindal, 1993). The second assumption within consultation is that consultees benefit

from the consultation process by gaining knowledge and skills in the problem-solving process, which will be useful when encountering similar problems in the future. (Albee, 1968; Alpert, 1976; Gutkin & Curtis, 2008; Lee & Niileksela, 2014; Macklem & Kalinsky, 2000; Sugai & Tindal, 1993).

Studies examining consultation outcomes provide empirical support for the first assumption, suggesting that consultation services are effective in resolving an immediate problem (Guli, 2005; Kratochwill, Elliott, & Busse, 1995; Lepage, Kratochwill, & Elliott, 2004; Mannino & Shore, 1975; Medway, 1979, 1982; Medway & Updyke, 1985; Reddy et al., 2000; Sheridan, Eagle, Cowan, & Mickelson, 2001; Sheridan, Eagle, & Doll, 2006; Sheridan et al. 1996). However, the existing evidence supporting consultation's second assumption contains methodological limitations that prevent a clear understanding of the process underlying the transfer of knowledge and skills from the consultant to the consultee (Cleven & Gutkin, 1988; Lee, Allen, & Skorupski, 2012; Lewis & Newcomer, 2002).

### **Transfer of Knowledge and Skills**

Consultation's secondary goal is to help consultees or teachers to learn the problem-solving process so that they are able to solve new classroom problems independently (Albee, 1968; Alpert, 1976; Briesch, Chafouleas, Neugebauer, & Riley-Tillman, 2013; Brown & Schulte, 1987; Caplan, 1970; Gonzalez, Nelson, Gutkin, & Shwery, 2004, Gutkin & Curtis, 2008; Macklem & Kalinsky, 2000; Sugai & Tindal, 1993; Zins & Ponti, 1996). Historically, studies examining consultation's secondary goal have focused on the transfer of specific consultation steps such as problem identification (e.g., Anderson, Kratochwill, & Bergan, 1986; Cleven & Gutkin, 1988; Watson & Kramer, 1995; Zins & Ponti, 1996). While useful in understanding the generalization of specific skills, these studies omit an examination of the transfer and retention

rates of the broader problem-solving process itself. If a consultee is expected to be able to effectively resolve a similar problem in the future, then this suggests that broader retention of the problem-solving process must successfully transfer from the consultant to enhance the skills of the consultee, a process referred to as *transfer of the problem-solving process*.

Transfer of the Problem-Solving Process (TPSP) describes the movement of knowledge of the problem-solving process from one person to another (Jacobson, Butterill, & Goering, 2005). For the purposes of this study, TPSP describes the movement of the process from the consultant to the consultee. Transfer of the problem-solving process from the consultant to the consultee may be influenced by a number of different consultee variables such as the consultee's ability to recall information and their orientation to the problem (Anderson, 2003). Yet, while the problem-solving process is central to consultation's methodology and intended outcomes, the degree to which the consultee's experience of problem-solving process influences their social-problem-solving orientation (D'Zurilla, Nezu, & Maydeu-Olivares, 2004) is unclear. Social-problem-solving is directly related to the idea of problem-solving and is only distinguished in that social-problem-solving defines problem-solving as it occurs in daily life (D'Zurilla & Nezu, 1982).

Perhaps part of the reason why little is known about transfer of the problem-solving process is due to the difficulty in examining the process itself. Consultation services are a field-based practice. As such, field-based services contain structural and contextual characteristics that hinder a clear examination of the process components that contribute to consultation outcomes (Lewis & Newcomer, 2002). Within consultation research, characteristics that impede a clear examination of contributing factors include the number of different consultation service models, consultant specific variables, consultee specific variables, as well as the diversity and

severity of problems encountered in consultation (Lewis & Newcomer, 2002). The individualized and multifaceted nature of consultation services introduces a methodological threat to the reliability and validity of comparative consultation studies. These threats may explain why studies examining model validity have traditionally focused on student outcomes instead of investigations examining the effects of the process itself on consultees (Lewis & Newcomer, 2002).

### **Purpose and Rationale for the Current Study**

This study will examine if exposure to the problem-solving process in an actual consultation results in superior outcomes in the consultee's problem-solving orientation, and their ability to recall the steps of the problem-solving process versus direct, didactic training in the problem-solving process. Lee et al. (2012) previously found that participants who were exposed to a video of an actual consultation process recalled problem-solving steps better than those with direct training in solving problems or those with no training at all. However, the study lacked a large sample size, did not provide examples of how participants' understanding of the process changed, nor did the study follow up to examine retention rates among participants.

While transfer of the problem-solving process to the consultee is well-documented as an intended secondary purpose in consultation, the empirical evidence that exists supporting this claim is significantly limited (Cleven & Gutkin, 1988; Kratochwill, Bergan, Sheridan, & Elliott, 1998; Lewis & Newcomer, 2002; Noel & Witt, 1996). Despite calls to examine this assumption (see Fuchs & Fuchs, 1989; Kratochwill et al., 1998; Noell & Witt, 1996), questions regarding the consultation process remain. This study seeks to advance prior research by examining if individuals' problem-solving orientation and skills improve following exposure to the consultation process. A measure of knowledge structures will be used within an experimental



study to examine if participants demonstrate improved understanding of the problem-solving process following exposure to the consultation process. Participants' orientation to and recall of the problem-solving process will be examined and compared across a condition of participants exposed to the problem-solving process through a consultation session against a condition of participants exposed to a direct didactic training of the problem-solving process. This question is important to examine because the findings may have implications for current practice recommendations. For example, if participant recall is poor, this suggests that the consultation process may not improve the consultee's problem-solving orientation or skills without further support such as additional follow-up procedures.

## **Summary**

Consultation is an indirect problem-solving service where those with specialized expertise, such as school psychologists, work with one or more persons, such as parents or teachers, to resolve a problem presented by a child (Gallessich, 1985; Sheridan et al., 1996). This triad is identified as the tripartite model of consultation (Bergan & Kratochwill, 1990; Gallessich, 1985; Lee & Niileksela, 2014; Sheridan et al., 1996; Tharp & Wetzel, 1970). Consultation comprises two key assumptions, the first is that the consultee will be able to resolve an immediate problem through the consultation process, the second is that the consultee will benefit from exposure to the problem-solving process and be able to resolve similar problems in the future (Albee, 1968; Alpert, 1976; Gutkin & Curtis, 2008; Lee & Niileksela, 2014; Macklem & Kalinsky, 2000). Prior research has supported the assertion that the consultee and the child will benefit from consultation services by resolving an immediate problem. (Guli, 2005; Kratochwill et al., 1995; Lepage et al., 2004; Mannino & Shore, 1975; Medway, 1979, 1982; Medway & Updyke, 1985; Reddy et al., 2000; Sheridan et al., 2001; Sheridan et al., 2006;

Sheridan et al. 1996). The second assumption, that the consultee will retain and transfer the skills learned through consultation to similar circumstances in the future, is well-documented (e.g., Albee, 1968; Alpert, 1976; Caplan, 1970; Gutkin & Curtis, 2008; Macklem & Kalinsky, 2000; Zins & Ponti, 1996); however, the empirical evidence supporting this claim contains significant limitations (Cleven & Gutkin, 1988; Lee et al., 2012; Lewis & Newcomer, 2002). Despite multiple calls for an examination of this assumption (Fuchs & Fuchs, 1989; Kratochwill et al., 1998; Noell & Witt, 1996) the evidence supporting consultation's second assertion remains limited (Lee et al., 2012). This study seeks to advance prior research by assessing changes in the participant's orientation to and knowledge of the problem-solving process following exposure to the process.

## Chapter 2: Literature Review

### What is Consultation?

Consultation is a problem-solving service where those with specialized expertise work with others to resolve problems; it is a fundamental service within school psychology (NASP, 2010b), and includes a minimum of three participants (a) the consultant, (b) the consultee, and (c) the child (Albee, 1968; Bergan & Kratochwill, 1990; Gallessich, 1985; Sheridan et al., 1996), see Figure 1 that shows the tripartite model. Within school-based consultation, the consultant often has specialized knowledge of mental health or behavioral interventions, their primary job is to facilitate the problem-solving process in consultation (Bergan & Kratochwill, 1990; Gallessich, 1985; Sheridan et al., 1996; Tharp & Wetzel, 1970). The consultee is the individual, typically the teacher, who has identified a problem that has been exhibited by a child and has knowledge of, and regular direct contact with the child, and is responsible for implementing an intervention (Gallessich, 1985; Sheridan et al., 1996). The child is a student who has been identified by the consultee as presenting a problem. These problems may range from behavioral concerns (e.g., crying, throwing objects), or academic deficits (e.g., multistep addition, phonemic awareness).

School-based consultation is derived from the work of Caplan (1964, 1970, 1974, 1977), and is described as a model of preventive and indirect service. In Caplan's model, consultants work with consultees to resolve their personal problems or biases, or improve knowledge and skills, to be more effective in their roles (Caplan, 1970). School psychologists quickly identified potential benefits and applications of Caplan's model, and began implementing this approach in schools (e.g., Bergan & Caldwell, 1995; Derner, 1965; Leton, 1964; McDaniel, & Ahr, 1965; Schmidt & Pena, 1964). Once adapted and implemented in schools, Caplan's 1970 model

transformed the primary role of school psychologists from that of a psychometrician and clinician, to a role that includes consultation to guide preventative and remedial services.

Consultation combines skills in recognizing problems, building a collaborative relationship with the consultee, and skills in guiding the consultation process. Scientific principles inform the consultation process, and guide the development, implementation, and refinement of data-based interventions. Essential components of consultation have been discussed by several authors (e.g., Kratochwill et al., 1998; Lee & Niileksela, 2014; Lewis & Newcomer, 2002; Noell & Witt, 1996), while not all features of effective consultation have been defined (Lewis & Newcomer, 2002), commonly agreed upon characteristics of consultation were identified and summarized by Lee and Niileksela (2014) as follows:

Consultation uses an *indirect services model* [emphasis in original] in which the consultant effects change for a client or client system through the consultee (Gutkin & Curtis, 2009; Zins & Erchul, 2002). This is in contrast to the direct services model (typically associated with the medical model), where a client (e.g., patient, student) is referred to a professional (e.g., physician, psychologist) and the professional sees the client and provides direct therapeutic treatment.

Consultation uses a *problem-solving process* [emphasis in original]. The problem-solving process in consultation is typically a four-part model that includes problem identification, problem analysis, intervention development, problem evaluation and plan implementation (Bergan, 1995). However, it is acknowledged that problem-solving is a complex executive process that is influenced by recognition and representation of the problem, the type of problem to be solved, knowledge, and

experience (Pretz, Naples, & Sternberg, 2003). For the purpose of this book, the terms ‘target problem and target behavior’ will be used synonymously.

Consultation recognizes the principle of *equifinality* [emphasis in original] originating from general systems theory (Bertalanffy, 1969). In open systems (i.e., those that are reciprocally influenced by contextual factors) such as schools, it is posited that there are a number of different and potentially effective approaches to solving the same problem (Truscott et al., 2012). This principle frees the consultant and consultee from being locked into believing there is only one answer to solving the problem at hand, thus opening the problem-solving process for examination of contextual variables and numerous potentially effective solutions.

The process of consultation is *voluntary* [emphasis in original]. This allows either the consultant or consultee to “opt-in,” continue, or withdraw from the consultation process at any time (Zins, Kratochwill, & Elliott, 1993). This freedom enhances “buy-in” for the consultee, thus assuming that the consultee remains in the consultative endeavor because of their perception of sufficient value for participating in such an activity. Consultees who are forced by an administrator to participate in consultation may exhibit reactance (Brehm, 1966) to the consultation endeavor.

Consultation is a *non-supervisory relationship* [emphasis in original] that should focus on the work-related or professional problems (versus the personal problems) of the consultee. It should be made clear to both the consultant and consultee that activities related to the consultation are and will not be used to judge the consultee or become part of the consultee’s professional file. While it is true that supervisors may in fact consult

with their employees, that relationship is qualitatively different than two parallel professionals working together on behalf of a client.

Developing a *coordinate power* [emphasis in original] (or co-equal) orientation toward working with the consultee is ideal. However, the consultation professional recognizes that power is an element of the consultation process that is not always equal. Erchul, Grissom, and Getty (2008) have studied the nature of power in consultation relationships and have categorized power into two types: *hard power* and *soft power* [emphasis in original]. In this study, practicing professionals reported that soft power was more effective for creating change and more acceptable than hard power to the consultee.

The consultant accepts and communicates to the consultee the importance of *confidentiality in the consultation relationship* [emphasis in original]. This does not mean that the communications that are part of the consultation process need to be completely confidential; however, the consultee should be aware of and agree to the limits of confidentiality. For example, considering the *Family Educational Rights and Privacy Act* [emphasis in original] (FERPA), it is certainly possible that others (e.g., parents, or other teachers, paraprofessionals, principal) have a “legitimate educational interest” in the outcomes of consultation that are designed to help a student academically, socially, or behaviorally. It behooves the consultant to think carefully about this and to inform the consultee of the limits of confidentiality at the beginning of the consultation process.

The primary goals of consultation are *remediation and prevention* [emphasis in original] (Gutkin & Curtis, 2009). Remediation focuses on developing an effective

intervention that will assist the consultee with the current problem they are experiencing with the client. The preventive element of consultation seeks to assist the consultee by developing skills or values to change or otherwise empower the consultee to work more effectively on similar problems in the future.

Consultation uses *data-based decision-making* [emphasis in original] with input from multiple data sources that include interviews with the consultee, observations of the client (or client system), interviews or interactions with the client, as well as information from the environment surrounding the consultee and the client. While these data sources may be both quantitative and/or qualitative, the ideal goal is have [sic] a firm basis for decision-making in the consultative process. The foci here are to reduce the tendency to make decisions based on emotional or convenience grounds.

An important goal for interventions that result from the consultation process includes both *acceptability* and *social validity of the intervention* [emphasis in original]. The interventions that result from a collaborative problem-solving process, including the selection of the intervention by the consultee, take into account the exigencies of classroom environment and guarantee a measure of the initial acceptability and social validity of the intervention (Elliott, 1988; Wolf, 1978). The term “Treatment acceptability” is often used synonymously with social validity. These terms are not synonymous, although treatment acceptability can be thought of as a component of social validity. Social validity is an important component to consider when designing interventions, but is often overlooked. It is useful to plan for and to assess social validity explicitly because it will allow consultants to have a better idea of interventions that produce socially important effects and are acceptable to those who implement them.

The consultant should be able to demonstrate significant *process expertise* [emphasis in original] to be effective. Process expertise (Schein, 1988) refers to both knowledge of the problem-solving process and the ability to regulate the problem-solving process in a complex multi-party interaction. Good consultants should also have some *content expertise*. *Content expertise* [emphasis in original] refers to the body of knowledge related to the specific problem to be solved. In school-based consultation, this would refer to an understanding of the factors that can cause or maintain academic and behavioral difficulties that may be present in the classroom (e.g., out of seat behavior, poor academic production or whole class disruptiveness).

*Responsibilities* [emphasis in original] are a key aspect of consultation. The consultant is responsible for process expertise, or regulation of the consultation process. When necessary, the consultant should also be able to contribute content expertise (e.g., psychological and educational expertise) related to the problem at hand. The consultant is responsible to be available to the consultee and to be patient and recognize that changing human behavior takes time and considerable effort. Finally, the consultant should reinforce the consultee for using the problem-solving process or interventions that have resulted from the initial consultation process. The consultee is responsible for contributing content expertise, which may include special training (i.e., teacher training) or knowledge of the client or client system that would enhance problem-solving and solution generation. This responsibility includes the collection of information about the student or client during the consultation process about the target problem. The consultee is also responsible for being actively involved in the problem-solving process and implementing solutions that result from it. Both the consultant and the consultee are



jointly responsible for the success or failures of the outcomes related to the consultation process.

*Follow-up* [emphasis in original] is a key aspect of the consultation process (Brown, Pryzwansky, Schulte, 2011). Rarely do solutions generated from consultation work immediately and effectively without modification. Follow-up can provide data on *intervention integrity* [emphasis in original] and steps that may be taken to fade out a more restrictive or time-consuming intervention that has been successful. If an intervention has been unsuccessful, the consultant and consultee can reenter the problem-solving process at any stage and make the endeavor a professional growth experience.

The consultation process assumes that the consultant has highly effective *communication skills* [emphasis in original]. Because a critical goal of the consultation process is to develop an effective relationship with the consultee, the consultant must possess authentic communication skills such as active listening (e.g., openness, warmth, genuineness). Communication leads and responses have been found to be important factors in behavioral (Bergan & Tombari, 1975) and instructional consultation (Rosenfield, 2002). (Lee & Niileksela, 2014, p. 3-6).

### **Models of Consultation**

Consultation refers to a general model of service delivery, rather than a specific set of procedures (Lewis & Newcomer, 2002). Since the introduction of psychoeducational consultation, theorists have proposed a number of different consultation models (e.g., Bergan & Kratochwill, 1990; Brown & Schulte, 1987, Gutkin, 1993; Lee & Niileksela, 2014; Sheridan, Kratochwill, & Bergan, 1996). Of the existing approaches to consultation, most can be classified into one of two broad philosophical models, these include the mental health consultation (MHC),

and behavioral consultation (BC) models. The primary goal across models is to resolve a problem; therefore, all consultation models incorporate a form of the problem-solving process. While the MHC and BC models share some assumptions and approaches, they differ in key areas.

Mental health consultation incorporates a psychodynamic orientation in understanding a consultee's problem (Caplan 1970). Since the introduction of the MHC model, researchers have proposed a number of revisions to the original theory (e.g., Caplan & Caplan, 1999; Meyers, 1981; Pryzwansky, 1974), as well as new applications of the theory such as group MHC (Altrocchi, 1972). The purpose of MHC is to assist consultees in resolving work-related problems while simultaneously improving the consultees' skills and knowledge so that the consultee is able to be more effective in their future work with a client (Caplan, 1970). The consultant's role within the MHC model is to promote an approach that remediates a consultee's shortcomings (Caplan, 1970; Caplan, Caplan, & Erchul, 1994). Consultee shortcomings in MHC are conceptualized as occurring primarily due to the consultee's past experiences involving an unresolved problem or unmet need (Caplan, 1970). The consultee's prior unresolved problems or unmet needs interfere with the consultee's ability to objectively understand their current client (Caplan, 1970).

MHC models identify the focus of the problem and subsequent solutions as occurring within the consultee. Accordingly, MHC consultants address the consultee's problems by questioning the consultee's underlying assumptions, describing their observations of the consultee, modeling appropriate behavior, or teaching the consultee new skills. Within MHC, the problem-solving process is ambiguous (Gallessich, 1985), thus MHC consultants are expected to utilize clinical skills and intuition to identify and resolve the consultee's problems

(Caplan, 1970, Caplan et al., 1995). Critics of the MHC model have noted that the theory itself does not lend itself to methodological rigor and lacks empirical support (Gresham & Kendell, 1987; Gutkin, 1981; Gutkin & Curtis, 2008; Sheridan et al., 1996).

Like MHC, the purpose of BC is to resolve an immediate problem while improving the consultee's skills and knowledge (Briesch et al., 2013; Brown & Schulte, 1987; Gutkin & Curtis, 2008, 2009; Macklem & Kalinsky, 2000; Sugai & Tindal, 1993; Zins et al., 1993; Zins & Ponti, 1996). However, key contrast between MHC and BC is that within the BC model consultants directly define and resolve problems using the problem-solving process (Bergan, 1995; Kratochwill et al., 1989; Lewis & Newcomer, 2002) and operationalize the consultee's problems using operant conditioning principles (Bergan & Caldwell, 1995; Kratochwill, VanSomeren, & Sheridan, 1989). The BC model gave rise to alternative approaches such as social learning (Brown & Schulte, 1987), conjoint-behavioral (Sheridan, et al., 1996), and eco-behavioral models (Gutkin, 1993; Lee & Niileksela, 2014). Though variations exist among component inclusion or emphasis, all BC models recognize the problem as occurring at the level of the child while also acknowledging environmental influences as affecting the child's behavior. Additionally, BC models explicitly identify and systematically approach the problem-solving process (Bergan, 1995; Lee & Niileksela, 2014), with common problem-solving components in behavioral consultation models including problem identification, problem analysis, intervention development, plan implementation, and problem evaluation (Lee & Niileksela, 2014).

### **Consultation Effectiveness**

There have been a number of studies examining consultation outcomes. These studies have shown that consultation is generally effective in addressing a variety of behavioral and academic difficulties exhibited by the child (Guli, 2005; Kratochwill et al., 1995; Lepage et al.,

2004; Mannino & Shore, 1975; Medway, 1979, 1982; Medway & Updyke, 1985; Reddy et al., 2000; Sheridan et al., 2001; Sheridan et al., 2006; Sheridan et al., 1996).

In 1985, Medway and Updyke reported results comparing the effectiveness of consultation models. The study included a meta-analysis of 54 consultation related studies, the results supported the use of consultation as an efficient means of service delivery, evidencing improved consultee outcomes in approximately 71% of cases (Medway & Updyke, 1985). The authors reported that MHC studies demonstrated strong effect sizes in changing the consultee's behavior ( $ES = .89$ ), with the averaged effect sizes of attitudinal and behavioral changes in MHC outcomes being stronger for consultees ( $ES = .68$ ) than for child outcomes ( $ES = .28$ ) (Medway & Updyke 1985). Clients in this review, identified as both children and organizations, improved in approximately 66% of cases (Medway & Updyke, 1985). However, the authors found no evidence supporting differences in effectiveness across consultation models (Medway & Updyke, 1985).

In an examination of consultation preferences among school psychologists and teachers Medway and Forman (1980) asked participants to view videotapes of a school psychologist using either a BC or MHC model when consulting with a teacher. After viewing the assigned video, participants rated the effectiveness of the consultation session. The authors found that school psychologists rated the MHC model as more effective, while teachers rated the BC models as more effective. When examining school psychologist and teacher perceptions of the consultant's personal attributes, Medway and Forman reported that teachers and school psychologists viewed the behavioral consultant as more efficient, while school psychologists, but not teachers, viewed the behavioral consultant as more targeted in the consultation process and overall more competent (Medway & Forman, 1980).

In a meta-analytic review of consultation outcomes spanning 1985-1995, Sheridan et al. (1996) found consultation generally produced some positive results in approximately 76% of the 46 studies reviewed. Further analysis by Sheridan et al. (1996) found that BC models were the most widely studied of consultation models (46%), followed by MHC (11%), with the remaining (43%) of models including either organizational approaches, “other”, or unspecified. When compared by model, BC models demonstrated stable positive results, with 95% of reported studies producing at least one positive finding, and 89% of the studies producing overall results in a positive direction. BC outcomes evidenced superior positive overall outcomes when compared to MHC (57%), “other” (29%), or unspecified models (67%).

Reddy et al. (2000) examined 37 studies spanning from 1986-1997 examining the effects of consultation on problems categorized as internalizing (anxiety, dysphoric mood, social isolation), externalizing (hyperactivity, off-task behavior, aggression, defiance), social skills deficits (making or maintaining positive peer or adult friends), or medical issues/conditions. The results revealed that consultation resulted in positive child outcomes with effect sizes ranging from 0.50 to 1.49, with the strongest outcomes associated with BC interventions targeting externalizing behaviors (Reddy et al., 2000). BC models evidenced an effect size of 1.36 (SD = 1.44), while the MHC model evidenced an ES of .53 (SD = .22). The authors referred to these effect sizes as “large”, and “medium” for BC and MHC models respectively (Reddy et al., 2000, p. 1). Analysis of BC models in Reddy et al.’s study revealed effect size outcomes of 1.41 (SD = 1.47) for children, and 1.51 (SD = 1.66) for consultees. The reported effect size for MHC consultee outcomes was 0.53 (SD = 0.22), though no effect sizes were reported for children outcomes (Reddy et al., 2000).

In a 2004 study, Lepage et al. examined outcome effect sizes, Goal Attainment Scaling (GAS), and consumer satisfaction ratings of consultation services. Referral problems addressed in the Lepage et al. (2004) study included aggression, noncompliance, tantrums, class disruptions, withdrawal, sustained crying, and transitions. Lepage et al.'s (2004) work replicated an earlier study by Kratochwill et al. (1995). Overall, the findings by Lepage et al. (2004) and Kratochwill et al. (1995) were similar and supported BC as effective in addressing behavioral concerns. Lepage et al. (2004) reported effect sizes for independently observed cases ( $n = 31$ ) at 0.51, with effect sizes ranging from negative effect sizes identified in 8 cases, to effect sizes of 0.8 or larger in 11 cases. Consultee ratings on the GAS listed perceived improvements in client behavior in 57% of cases reviewed. Correlated effect size scores and GAS ratings revealed a moderate relationship ( $r = 0.48$ ). Consumer satisfaction measures were collected using the Consultant Evaluation Form (CEF, Erchul, 1987; Erchul & Chewing, 1990) to identify the consultees perceptions of the consultant and consultation services. The CEF is a seven point Likert scale (Likert, 1932), where higher scores indicate greater consultee satisfaction (Erchul, 1987; Erchul & Chewing, 1990). Lepage et al. (2004) identified mean scores of 5 or above as indicating satisfactory ratings from the consultee. Results of the CEF revealed mean ratings of 5 or above across items.

To date, consultation outcomes, particularly BC outcomes have evidenced favorable results in the research literature. These results support consultation's first goal, which is to resolve a presenting problem (Briesch et al., 2013; Brown & Schulte, 1987; Gutkin & Curtis, 2008, 2009; Macklem & Kalinsky, 2000; Sugai & Tindal, 1993; Zins et al., 1993; Zins & Ponti, 1996). However, consultation's second goal, to prevent future problems, has not received equal attention. Inherent within consultation's second goal is that the consultee learns from the

consultation process. Reddy et al. (2000) attempted to examine this issue by including in their literature review an analysis of skills acquisition; however, because the focus of the study examined consultation outcomes, the authors excluded a number of other studies that examined the transfer of knowledge from the consultant to the consultee during the consultation process, but neglected behavioral outcomes. While the acquisition of new skills related to the problem at hand is an important component in preventing future problems, the skills examined include an intervention set specific to the consultee's current identified problem. Consequently, because the intervention design is specifically tailored to the current setting and circumstance, the consultee may perceive the intervention, as well as the process, as less generalizable than intended by the consultant. Perhaps examining what the consulted learned from the consultant and the consultation process as they work together is a better way of examining what is learned through consultation services.

### **Problem-Solving**

Problem-solving comprises a broad field of study (Davidson & Sternberg, 2003) and is fundamental component of school-based consultation (Lee & Niileksela, 2014). Problem-solving as a field of study generally examines the recognition of, and strategies used to resolve, problems (Davidson & Sternberg, 2003). Problem complexity, intransparency, dynamics, and polytely are facets that compose the study of problem-solving (Funke, 1991). Problem complexity includes a consideration of the number and variety of variables that influence, or are influenced by a problem. Intransparency refers to the observable and measurable aspects of a problem. Problems often contain hidden variables that increase the complexity of the problem and hinder the search for solutions. Dynamics represents an examination of the influence of time considerations on problem-solving. An example of a dynamics variable is the prospect that a

problem situation will further deteriorate in effectiveness over time. Dynamics also includes delayed, or latent effects that occur when an intervention is implemented, but the effects are not immediately observable. Polytely is an assessment of conflicting goals held by one or more individuals. A common example of polytely occurs when an individual shopping for a new car wants a car that is both luxurious and cheap. In order to resolve the conflict, the individual will need to identify the most important goal, or as is more common in the case of conflicting goals between two or more individuals, a compromise between the competing goals.

While the study of problem-solving contains broad facets that influence problem-solving outcomes, researchers have identified actionable steps common among successful problem-solvers. Pretz et al. (2003) reported that successful problem-solvers identify and define the problem, generate solutions for the problem, designate resources to solve the problem, monitor progress toward the goal, and evaluate the solution for accuracy. Contemporary models of problem-solving such as Heppner's (1978) social-problem-solving model incorporate the steps identified by Pretz et al. (2013), as well as components that account for the influences of the broad facets identified by Funke (1991).

*Modifications in problem-solving for practice.* To fit the needs of the mental health profession, Heppner (1978) proposed a modification of D'Zurilla and Goldfried's (1971) model that further delineated specific steps required for effective individual functioning. Heppner's model also includes methods to assist service providers in training individuals in learning and implementing problem-solving steps. Among others, Heppner proposed techniques such as verbal conditioning, modeling, and specific training in systematic decision-making. The problem-solving model selected for examination in this study is a modification of Heppner's (1978) model. The modified model used here includes the actionable steps Pretz et al. (2003)



identified as common among successful problem solvers, as well as the problem-solving components Lee and Niileksela (2014) described as prevalent among behavioral consultation models.

Heppner's model (1978) contains five major steps including general orientation, problem definition and formulation, generating alternatives, decision-making, verification and evaluation. Each step contains related sub-steps, or classes of actionable behaviors. For example, within step one (general orientation), there are three classes of actionable behavior including a) acknowledging that problems are a universal part of life, b) identifying and labeling problems, and c) actively and intentionally approaching the problem. The general orientation stage is the first among Heppner's (1978) five stages, and contains behaviors that are designed to cue the consultee to constructively frame their perception of the problem-solving process. By explicitly addressing these concerns early in the process, the consultant encourages the consultee to engage in adaptive problem-solving behaviors.

In the problem definition and formulation stage, the consultant guides the consultee in gathering relevant information and facts, operationalizing ambiguous aspects of the problem, and identifying variables that influence the problem (Lee & Niileksela, 2014). While all stages of Heppner's problem-solving model are vital to the process, the problem definition and formulation stages direct the remaining aspects of the problem-solving process and affect the outcome. Successful implementation efforts hinge on the ability to correctly identify and formulate the problem, if done incorrectly, then efforts will incorrectly focus on irrelevant problems (Schwartz & Carpenter, 1999).

In Heppner's (1978) third stage (generating alternatives), the consultant works with the consultee to identify a list of potential solutions that may be helpful in resolving the problem. At

this stage, the consultant is responsible for facilitating creative brainstorming behaviors, while working to reduce factors that may inhibit or frustrate the consultee in identifying potential solutions. While experience and prior knowledge plays a role in an individual's ability to identify potential solutions, the consultant's main role is to encourage the consultee to consider creative, even impractical solutions, in an effort to free the consultee of becoming fixated on a particular solution.

In the decision making stage, consultants assist the consultee in selecting one of the acceptable solutions identified in the generating alternatives stage. Here the consultant's goal is to assist the consultee in selecting the best available solution (Lee, Niileksela, & Allen, 2014). The best available solution is a solution that the consultee is likely implement, factors that consultants should consider in selecting the best available solution include identifying the solution that is most likely to produce favorable outcomes, minimizes negative outcomes, is desired by the consultee, and is one that the consultee is likely to accept responsibility in implementing. To improve the likelihood of correct selection, the consultant should explicitly address the consultee's perception of outcome probabilities, solution preferences, and potential consequences of implementing the identified solution.

Heppner's final stage (verification and evaluation), involves examining implementation efforts and outcomes associated with the intervention. Here the consultant's role is to examine if the identified solution was implemented appropriately, and if the intervention resulted in desirable outcomes. If the intervention matched the problem behavior and was implemented appropriately, then the problem should be acceptably remediated. However, if there is a breakdown in this process, the consultant's task is to work with the consultee to identify the breakdown in the problem-solving process and remediate the intervention effort.

Lee et al. (2012), advanced Heppner's (1978) model by reorganizing and further delineating actionable steps. Reorganizing selected steps were not expected to reasonably alter the outcome of the problem-solving process (Pretz et al., 2003), Lee et al. (2012) re-ordered the steps to create a presentation that was conceptually logical to both novice consultants and consultees. For example, Heppner's first stage (general orientation) includes acknowledging that encountering problems is a universal human experience, identifying and appropriately labeling a problem situation, and recognizing that problems should be approached purposefully. In Lee et al.'s (2012) model, the general orientation step is re-labeled as establish problem-solving orientation and includes 1. approach the task/problem head on, 2. recognize that problems are a universal aspect of life, and 3. recognize that all problems can be solved. Two of Heppner's three general orientation action steps are maintained in the first step of Lee et al.'s (2012) model. Heppner's second actionable step under the general orientation step, identify and appropriately label the problem situation is re-organized under Lee et al.'s (2012) second major step titled define and formulate the problem.

Lee et al.'s (2012) model used behavioral literature to further refine Heppner's (1978) model. For example, under the second step, define and formulate the problem, the Lee et al. (2012) include identifying behavioral antecedents, consequences, as well as contextual influences that affect the problem. Another example of refinements proposed by Lee et al. include the addition of generating a hypothesis regarding potential functions of the behavior before brainstorming potential solutions to the problem. The changes proposed by Lee et al. (2012) are reflected in the presentation order of the problem-solving process within this study, see Table 1 for a listing of the steps proposed by Lee et al. (2012) which will be utilized in this study.

While the problem-solving process is described in a linear fashion here, individuals who are flexible in their approach are likely to be more successful than individuals who maintain a rigid approach (Pretz et al., 2003). Because the problem-solving process may be completed in multiple sequences without affecting the process's outcome, Lee et al. (2012) identified steps and actions where re-sequencing the problem-solving steps may occur without reasonably interfering in the outcome of the problem-solving process or intervention identification. Figure 1 contains Lee et al.'s, (2012) conceptual organization of the problem-solving process where directional arrows identify reasonably correct sequences the process could be traversed. Single-headed arrows represent steps that are completed unidirectionally, while double-headed arrows indicate non-directional steps. All steps within one group of arrows must be completed before the process is able to progress forward. For example, if there are four steps connected with a double-headed arrow, this indicates that the steps may be completed in any order, but all steps must be completed before moving to the next step or group of steps. The sequencing modifications identified by Lee et al. (2012) are useful when examining correct recall orders of the problem-solving process. Recall orders refers to the participant's recall of sequences or steps of an idea. This study will examine recall orders of the problem-solving process and therefore will use the Lee et al.'s (2012) modified version of Heppner's (1978) problem-solving model, including Lee et al.'s (2012) sequencing model of the process to identify correct recall among participants.

### **Transfer of Problem-Solving within Consultation**

Transfer of the problem-solving process (TPSP) within consultation as an area of study spans approximately 30 years, and addresses a complex topic, spanning training across targeted groups and settings. A number of studies related to the idea of knowledge transfer are reviewed

within this section; consequently, Table 2 provides an organized summary of the studies reviewed in this section.

Examining the effects of training in the consultation process with 14 school psychology graduate students, Curtis and Zins (1988) provided students with 2.5 hours of weekly formal consultation instruction for 11 weeks. Over the course of the study, the authors examined change in the students' questioning skills, behavioral specificity verbalizations, and problem solution quality at week 4, and again at week 11. Curtis and Zins (1988) videotaped the students during simulated consultation sessions, then used a modified version of the Consultation Analysis Record (CAR, Bergan & Tombari, 1975) to examine students' verbal expressions of complete thoughts. The results of study showed statistically significant improvements across students in their questioning, and behavioral specificity skills. Within the problem solution category, though the results were not significant Curtis and Zins noted that the results did approach significance. Additionally, when provided individualized instructor feedback, the students further improved in their behavioral specificity skills, though the same effect was not supported when the authors provided students individualized feedback in the areas of questioning or problem solutions. Though useful in understanding the general process of transfer, Curtis and Zins's (1988) study did not examine the transfer process within a traditional consultant-consultee dynamic, thereby limiting the results to an instructor-student dynamic.

McDougall, Reschly, and Corkery (1988) examined short-term training with 16 support personnel (i.e., school psychologist, social workers, and consultant) by examining the effectiveness of behavioral consultation through a 1-day in-service training session. Before attending the training session, participants audiotaped a consultation session and submitted it to the trainers prior to beginning the workshop. Perhaps because training was limited to a 1-day

session, McDougall et al. (1989) limited training to a portion of the interview phase (i.e., problem identification). Within the problem identification portion of the consultation process, trainers provided direct instruction, videos modeling, and a live demonstration. Trainees then alternated roleplaying either a consultant or teacher, while trainers observed and provided individualized feedback.

To evaluate learning, trainees audiotaped and mailed the trainers a behavioral consultation case following the training session (McDougall et al., 1988). The trainers examined the audiotapes from before and after the workshop to determine if selected components of the problem identification interview were met. Additionally, McDougall et al. used a portion of the CAR (Bergan & Tombari, 1975), scoring each trainee's audiotape on message source, content, process, and control. The results showed that compared to baseline scores, trainees evidenced increased observation statements and consultant led statements. Additionally, trainees evidenced statistically significant increases in addressing all identified components of the problem identification section (i.e., behaviorally defined, strength of target behavior is estimated, antecedent is behaviorally defined, consequence of behavior is defined, specified behavioral goal, and observation system is established).

Kratochwill et al. (1989) expanded on Curtis and Zin's (1988) work, by examining variations in teaching consultation interview techniques among four school psychology graduate students, as well as a replication study that involved two practicing school psychologists in an applied setting. The authors utilized a multiple-baseline design to examine participant knowledge in three phases of the consultation process (i.e., Problem Identification, Problem Analysis, and Treatment Evaluation), as well as a baseline scenario. Kratochwill et al. varied the participants' exposure to training materials using either a training manual and individual

feedback or a training manual with individualized feedback as well as a videotaped interview of the consultation process. The results showed that all training configurations were effective for training purposes with no major differences in performance observed across student comparisons. Additionally, the practicing school psychologists reported successful implementation (a comparison of the practicing school psychologists against the students was impractical due to methodological variations and missing data from one of the two participants).

Lepage et al. (2004) replicated earlier work by Kratochwill et al. (1995) examining consultant's gains in knowledge and skills during a multi-year competency-based training program designed for graduate students. Training components involved assigned readings, observations of video models, participation in role-play scenarios, self-evaluations using the trainee's audiotapes for review against the Behavioral Consultation Process Checklist, and individual supervision from an advanced graduate student. Lepage et al. (2004) assessed training through audiotapes of consultation sessions. In addition to reviewing audiotapes, the consultants in training completed three assessments at four time points (pre-training, post-training 1, post-training 2, post-training 3, and follow up). The identified assessments included the Behavior Consultation Knowledge Test, the Behavior Modification Test, and a modified version of O'Dell, Tarler-Benlolo, and Flynn's (1979) Knowledge of Behavioral Principles as Applied to Children. The results indicated improvement across all three knowledge assessments from pre-training.

The work of authors such as Curtis and Zins (1988) Kratochwill et al. (1989), and Lepage et al. (2004) in the area of training students in consultation refined the process of consultation instruction, and with the additional work of McDougall et al. (1988) likely led to improvements in service delivery. Though the pedagogical methodologies continue to improve in the area of formal consultation training, it is less clear how TPSP occurs when examined in the context of

educators learning or experiencing the process in real life. However, the question remains: What would outcomes look like when the participants involve educators as opposed to specialists who likely hold existing background knowledge? This is an important question, as differences exist in the target population's background knowledge of foundational concepts, motivation to learn, and availability of training time. For example, when examining TPSP among graduate school psychology students Lepage et al. (2004) noted that the students had prior exposure to a foundational behavioral class such as applied behavioral analysis, something that is likely less common among typical consultees. The remaining literature review examines TPSP occurring through consultation related services within educational settings.

*Transfer of the problem-solving process in applied contexts.* Curtis and Watson (1980) were the first to examine knowledge transfer within educationally-based consultation practices. Curtis and Watson randomly assigned classroom teachers to one of three consultation conditions, low-skilled consultant, high-skilled consultant, or no consultation (control). Consultants then met with their assigned teacher as many times as the consultant and teacher desired over the course of a three-week period to resolve the identified problem. Curtis and Watson's (1980) results indicated that following exposure to a high-skilled consultant, teachers spent more time on topic, and provided more factually based information, and held better problem-clarification skills in a later interview when compared to teachers exposed to a low-skilled consultant, or teachers who were part of the no consultation condition. These findings are helpful in recognizing role and importance of skilled consultants. The authors reported significant results across content relevancy, time in seconds, factual utterances, and percentage of background utterances for teachers in the high-skill consultation condition compared to teachers in the low-skill or no consultation conditions. When the authors individually compared the same four



variables across high-skill and low-skill conditions, the results continued to support significant differences in time in seconds, and percentage of background utterances in favor of participants exposed to the high status consultant. However, in content relevancy, and percentage of factual utterances when individually compared across high-skill and low-skill consultants the results approached, but did not reach significance.

Like Curtis and Watson's (1980) study, Revels and Gutkin (1983) examined effects of the perceived consultant status on consultee-generated solutions by presenting a written description of a problem behavior, and then randomly assigning participants to a specified condition within a two by four factorial design. Participants read a short biographical description of the consultant who created the materials for them to review; participants were unaware that the materials presented did not differ across consultation conditions. The results of the study showed no interaction between modeling condition by consultant status regarding the number of identified solutions. However, when comparing the experimental modeling conditions (i.e., instructional, cognitive, exemplary) against the control condition, the results revealed a statistically significant difference between the control and the modeling conditions, though further analysis did not support statistically significant differences among modeling conditions. When comparing scores generated by participants in peer versus high status conditions, results showed that participants in the high status condition generated more alternative solutions when compared to participants in the peer status condition. Revels and Gutkin's (1983) work underlines the importance of the consultant-consultee relationship. The finding that experimental conditions generated more solutions than the control condition, suggests that simply modeling the process of generating solutions results in additional solutions from which to choose. Moreover, results highlight the importance of the perceived status of the consultant.

Specifically, the authors stated that “the data suggest that within a consultation relationship, consultants should maximize the representation of their professional experience and expertise to facilitate the transmission of problem-solving skills.” (Revels & Gutkin, 1983, p. 316).

Anderson et al. (1986) examined consultee generated behavioral specificity, as well as knowledge acquisition of behavioral principles in a study of participants completing an in-service training that consisted of either training in classroom behavior modification and consultation, or training in procedural aspects of consultative service training condition (a control condition). All participants in Anderson et al.’s study (1986) completed a pretest using a modified version of the Knowledge of Behavioral Principles as Applied to Children – Form A (KBPAC, O’Dell et al., 1979) which measured participant knowledge of behavioral principles. Participants also completed a 20-question rating scale quantifying their attitudes towards behavior modification prior to completing the assigned training materials. The results supported a significant training effect revealing that training lead to significant increases in participant knowledge of behavioral principles. However, further analysis of interactions among training by question type did not evidence statistical significance. The authors further found that participant ratings of attitude toward behavior modification and KBPAC scores significantly predicted training outcomes. Anderson et al.’s (1986) study added to the literature by examining the influence of general versus specific behavioral questions on consultee responses, as well as recognizing the importance of consultee attitudes on TPSP. Furthermore, the researchers ensured consistent exposure to the problem-solving process by utilizing video exposure and modeling. The technique of video exposure provided useful guides for future studies in this area; in particular, the authors’ use of video-based methods to standardize conditions across

participants highlights the importance of understanding the basic components of this process before field-based studies may occur.

Cleven and Gutkin (1988) examined TPSP by exposing participants to one of three video conditions where the video-taped individual engaged in cognitive modeling of the problem-solving process. The purpose of this study was to establish if the use of cognitive modeling increases consultee effectiveness in implementing the problem-solving process. Cleven and Gutkin (1988) describe cognitive modeling as a process where the consultant makes “internal self-talk... overt to observers” (p. 380). Cleven and Gutkin provided an example of cognitive modeling used in the consultant videos writing:

As you remember, we discussed how it’s most helpful at this point to get a complete list of Tina’s problems before we decide which one to focus on. So before we decide which behavior to work on first, let’s be sure we have a complete list of problem behaviors. Are there other things about Tina’s behavior at school you’ve noticed? Is she having any other problems? (1988, p. 383)

Whereas an example of consultation without cognitive modeling provided by Cleven and Gutkin (1988) includes the following, “What other things about Tina’s behavior at school have you noticed? Is she having any other problems?” (p. 383).

To examine the effects of modeling on TPSP, Cleven and Gutkin (1988) presented all participants with the same short video of a student exhibiting a problem behavior. Next, participants viewed one of three randomly assigned consultation-modeling videos discussing the child behaviors in the first video. The assigned videos included either a video of consultation with cognitive modeling of the consultation process, a video without cognitive modeling, or a video of a consultant and consultee discussing irrelevant information, which served as a control

condition. In both experimental conditions, the consultants addressed the process of prioritizing problem behaviors, defining the problem behavior in behavioral terms, and setting appropriate goals. Following the first set of videos, participants viewed a second set of videos following the same format (i.e., video of problem behavior, condition specific modeling video). After viewing the second set of videos, all participants then viewed a third video of a problem behavior, then created a written description of the problem behavior they just viewed. Finally, the researchers instructed the participants to write about the process of identifying the problem behavior while imagining presenting the information to a group of teachers.

Judges blind to the hypothesis of the study scored the written descriptions created by the teachers participating in the study. The results of the study showed that all participants in the experimental conditions (with cognitive modeling and without cognitive modeling) created better goal statements than did participants in the control condition. Additionally, participants exposed to the cognitive modeling condition later evidenced superior skills in writing a behavioral description of an identified problem. Participants in the cognitive modeling condition also evidenced superior skills in their ability to prioritize problems, and create goal statements over those in the other conditions.

Cleven and Gutkin's (1988) study provided evidence supporting the use of consultation, but more importantly, the study supported cognitive modeling as an important component within consultation services. This study provided an early example of dissecting consultation techniques into components to develop empirical knowledge for consultation practices. Within the paper, the authors call for further studies to examine the effects of consultative techniques on the consultee's retention of the problem-solving process.

Examining practical effects of TPSP, Robbins and Gutkin (1994) utilized a multiple baseline across-subjects design with three consultees serving also as participants to examine consultation-induced changes in consultee remedial and preventive behavioral practices. In the study, the authors collected observational baseline data of the child's on-task behavior, and positive teacher verbalizations. In addition to observational data, the authors also examined brainstorming activities at five different points of the study. Robbins and Gutkin implemented consultation services with one consultee at a time over three phases, with each phase adding one additional consultee. Consultation services used the problem-solving process with process overt techniques recommended by Cleven and Gutkin (1988). The authors scored consultee behavior by having independent raters, who were blind to the hypothesis of the study, observe and score the consultees' positive verbal behaviors, providing a positive score for verbal behaviors that were reinforcing for on-task behaviors such as "I like the way you are working." (p. 154), contingent on the student behavior, an example of which might include "Timmy, I like the way you approached that addition problem.", or general positive remarks to any student or the class.

Robbins and Gutkin (1994) wrote that in post-intervention interviews the teachers reported they implemented the interventions as planned; yet, because a portion of the intervention as designed by the consultant included increased verbal praise for the identified student, the observational data did not support the teachers' statements. The results of this study showed no overall improvements in consultee positive verbal behavior, or knowledge of the problem-solving process as measured by brainstorming, or preventative behavior.

Robbins and Gutkin (1994) examined practical effects (i.e., observable changes in consultee verbal and brainstorming behaviors) resulting from consultation in an applied setting. The authors focused on changes in positive verbal comments, and increases in brainstorming

behavior resulting from consultation interactions. The results of the study evidenced little to no changes in consultee behavior. Using observational data, the authors reported that the teachers initially averaged less than .4 instances of positive teacher verbalizations during 30-minute observations; following the consultation, the authors stated “the magnitude of this change was so small as to be meaningless.” (p. 157). Changes in brainstorming behaviors calculated using percentages ranged from -20% to +14% with median changes of 0%.

Watson and Kramer (1995) examined the issue of knowledge TPSP through a combination of didactic, modeling, and rehearsal plus feedback methods. The authors divided participants into small conditions to teach components of the problem-solving process over the course of three training sessions. The content of the instruction varied across conditions so that the authors were able to examine the relative effectiveness of the three conditions, which included didactic, didactic with modeling, and didactic with modeling and rehearsal with feedback. At the end of each training session, and again seven days following the conclusion of the third training session, study participants viewed one of four randomly assigned videos of a child exhibiting a problem behavior. The researchers altered video of the problem behavior they showed to participants at the end of each training session to avoid practice effects. The videos allowed the researchers to standardized participant exposure to the assigned condition.

To examine knowledge transfer, the authors measured the participant’s skills in problem identification, and problem analysis. To measure problem identification and problem analysis at the end of each training session, and again seven days following the conclusion of the study, the researchers utilized the Problem Identification Questionnaire (PIQ, Cleven & Gutkin, 1987) and the Problem Analysis Questionnaire (PAQ). Using the PIQ, participants identified the primary problem behavior, and developed a goal statements related to the problem behavior on the

observed video. Researchers instructed participants to use the PAQ to identify the antecedents and consequences of the problem behavior in relation to the child, peers, and teacher. Judges derive scores on both the PIQ and the PAQ by scoring participant responses in terms of “accuracy and behavioralness” (Watson & Kramer, 1995, p. 285).

The results indicated that participants in all treatment-training conditions (i.e., didactic, didactic with modeling, and didactic with modeling and rehearsal with feedback) scored superior to participants in the control condition in on the PIQ and PAC. Furthermore, participants in the didactic with modeling, and participants in the didactic with modeling and rehearsal with feedback conditions scored superior to participants in the didactic condition on the PIQ and PAC. However, no significant differences were noted between the didactic with modeling, and didactic with modeling and rehearsal with feedback conditions.

Watson and Kramer’s study provided useful guides for future researchers; in particular, the authors’ use of modeling and didactic conditions when measuring knowledge retention of the problem-solving process. Interestingly, though the authors utilized a separate didactic condition, they did not include a separate modeling condition in this study, which would have provided an interesting comparison against the other conditions. A separate modeling condition using cognitive modeling (Cleven & Gutkin, 1988) might serve as an example of the transfer of knowledge comparing a typical consultation against a didactic training.

In examining knowledge TPSP, Zins and Ponti (1996) took a more traditional training approach by analyzing the effects of in-service training on the educators’ ability to identify problems, as well as the effect of training on reducing the number of internal, or home/family attributions made about problem behaviors. The purpose of training educators was to provide the participants with a foundation for problem-solving, consequently the researchers created two

conditions, including a control condition, and provided educators in the experimental condition a full day of training in the problem-solving process. Training occurred over the course of a full instructional day, and consisted of both didactic and experiential aspects and addressed primarily problem clarification skills through an ecobehavioral framework. Approximately nine weeks following the conclusion of the initial training session, the researchers conducted a follow up session to reinforce the participant's understanding of concepts and applications of the problem identification process, and further influence participant attributions of the problem behaviors. Members of the control condition (in a separate school) received separate training regarding communications skills, and did not include components of the problem-solving process, or behavioral concepts as they relate to attributions of the problem behavior.

To measure TPSP, Zins and Ponti (1996) devised a Problem Clarification Skills Checklist (PCSC). The PCSC is conceptualized within an ecobehavioral framework, and addresses, among other things, participant responses in identifying, and describing the problem behavior; as well as identification of antecedents and consequences of the problem behavior. Zins and Ponti had raters, blind to the hypothesis of the study, score participant responses. Zins and Ponti measured attributional changes by coding participant responses into one of four categories, which included internal to the child, home/family characteristics, instructional/classroom, and interactional. A fifth category entitled unclassifiable served to categorize comments when other categories could not accurately account for a statement.

The results demonstrated that members of the experimental condition exhibited a statistically significantly greater number of identified behaviors in PCSC. Participants in the experimental condition also demonstrated significantly increased statements in problem clarification statements from pre- to post-intervention, whereas participants in the control



condition did not. When analyzing attribution statements, participants in the experimental condition made significantly less attributions about the child following training; however, the same was not true for the control condition. While experimental participants made significantly less attribution about the child post training when analyzed by category, the attributions made continued to fall primarily in the internal category across conditions. Zin's and Ponti's (1996) study provides useful information regarding the effects of formal training in problem-solving behavior.

*What has not been studied?* Consultation research has primarily focused on outcomes resulting from consultation. Interestingly, though much of the theoretical construct of consultation relies upon the assumption that verbal interactions between the consultant and consultee are sufficient to lead to TPSP (Alpert, 1976; Briesch et al., 2013; Brown & Schulte, 1987; Gonzalez et al., 2004; Gutkin & Curtis, 2008; Kratochwill et al., 1998), evidence supporting this claim is tenuous (Lewis & Newcomer, 2002; Kratochwill et al., 1998; Noell & Witt, 1996). Researchers and theorists have noted that the consultation session will lead to behavioral changes, specifically improvements in problem-solving ability, in the consultee (Albee, 1968; Alpert, 1976; Caplan, 1970; Gutkin & Curtis, 2008), and that the consultee will generalize the learned problem-solving skills to similar future circumstances (Alpert, 1976; Bergan, 1995; Briesch et al., 2013; Brown & Schulte, 1987; Caplan, 1970; Gonzalez et al., 2004; Gutkin & Curtis, 2008; Jacobson et al., 2005; Kratochwill et al. 1996; Noell & Witt, 1996). Yet, these two ideas rest upon the assumption that verbal interactions alone are sufficient for knowledge transfer of the problem-solving process to occur. When intervention efforts fail in applied settings, the conclusion that may be drawn is that the direct service provider refused to implement the consultant's intervention with integrity (e.g., Frey et al., 2013). While this

conclusion is plausible, it is also plausible that the assumption that verbal interactions between the consultant and consultee are sufficient to lead to TPSP is incorrect.

Noel and Witt (1996) reviewed the assumption that “Talking to teachers is sufficient to cause them to change their behavior.” (p. 192) and have summarized work in this area. As such, Noel and Witt write “The empirical support for this assumption is limited. The current authors were unable to locate any experimentally controlled studies which measured teacher behavior change as a function of BC.” (p. 196). The conclusions drawn by Noel and Witt (1996), as well as Kratochwill et al. (1998) indicate that more information is needed in order to determine if the consultation process leads to changes in consultee behavior. Yet, due to the nature of extraneous variables affecting consultation that include factors such as background knowledge of the consultee, complexity of the problem behavior, and support from administrative staff, conducting field studies to examine this claim has proven difficult. A review of the literature has yet to provide clear evidence of transfer of the problem-solving process resulting from consultation.

In sum, of the studies that do exist in this area, Cleven and Gutkin (1988) supported the use of cognitive modeling through consultation, while Anderson et al. (1986) described a method for using videos to standardize participant exposure to the consultation process. However, studies in this area have suffered from methodological limitations. Many studies in this area have relied upon indirect measures of knowledge retention (e.g., Cleven & Gutkin, 1988; Curtis & Watson, 1980; Robbins & Gutkin, 1994). Attempting to reduce the complexity of consultation to measurable components, some authors (e.g., Cleven & Gutkin, 1988; Revels & Gutkin, 1983) have narrowed the examination of the problem-solving process to a select subset of problem-solving components, while excluding other critical components. Other authors have utilized training procedures that were impractical in common consultation interactions, which are

not reflected in current educational practices (e.g., Anderson et al., 1986; Cleven & Gutkin, 1988; Zins & Ponti, 1996). Finally, many authors have not examined retention rates of the problem-solving process over time (e.g., Anderson et al., 1986; Curtis & Watson, 1980; Revels & Gutkin, 1983; Watson & Kramer, 1995). Where retention rates were examined, the methods utilized were unclear (Zins & Ponti, 1996). See Table 2 for an organized summary of the literature review.

### **Retention of the Problem-Solving Process**

Prior researchers have attempted to examine TPSP by examining participants' retention of the problem-solving process. Assessments of knowledge retention are dependent upon the type of knowledge structure the researcher wishes to assess (Bereiter, 1992). One type of context-based knowledge structure is known as referent knowledge (Bereiter, 1992). Referent knowledge structure describes a non-expert's cognitive structure of the elements and relationships among concepts in comparison to an expert's cognitive model of the same concepts (Acton, Johnson, & Goldsmith, 1994; Shavelson, 1974). The early knowledge structure of graduate students who have modeled their conceptualization and understanding of models after their scholarly readings, and professors' representations provide a familiar example of referent knowledge structure. Consultation's intended secondary purpose, TPSP, is an example of referent knowledge structure.

Traditional methods of referent knowledge assessment have included dichotomous and polytomous forced choice methods such as multiple choice tests. Other methods have included open-ended written responses such as essays. Forced choice and open-ended responses both exhibit advantages and limitations in assessment of knowledge structures. In an attempt to create a more thorough assessment, Shavelson (1974) described a method where non-experts identify

relationships among concepts, and then the non-expert's representation is then compared to an expert's conceptualization of the relationships. In Shavelson's 1974 method, now known as concept mapping (Ruiz-Primo & Shavelson, 1996), connections among ideas are represented by nodes where the proximity among those nodes indicate the strength of the relationship among concepts.

Reitman and Rueter (1980) published a variation of the concept mapping technique, which the authors intended for use in understanding of participant concept recall and formulation of the concepts. The technique, identified as the ordered-tree analytic method, allows researchers to record participants' knowledge recall, and illustrate participants' mapping of relationships among concepts. The technique assumes individuals organize related concepts into hierarchies that contain chunks of related information. When a completed structure of the concept is illustrated, the identified structure resembles a tree. The ordered-tree analytic method assesses a participant's breadth and depth of knowledge. The method assesses these levels of knowledge by providing participants with a concept, and then asking the participant to begin naming related information by free recall until they have exhausted all related concepts. Participant concept formulations typically contain higher-order concepts that comprise lower-order concepts. To identify participant formulations of hierarchies, and concept relational directionalities, Reitman and Rueter use an algorithm across multiple participant trials to identify unidirectional, bidirectional, and non-directional organization patterns. Unidirectional responses are identified when a participant consistently recalls a cluster of concepts in the same order (e.g., Trial 1 = ABC, Trial 2 = ABC). Bidirectional patterns are identified when participants consistently begin a recall cluster with either the first or final concept (e.g., Trial 1 = ABC, Trial

2 = CBA). Finally, non-directional systems are identified when a participant produces inconsistent recall orders for a cluster of items (e.g., Trial 1 = ACB, Trial 2 = BAC).

Noticing a potential application for classroom assessment Naveh-Benjamin, McKeachie, Lin, and Tucker (1986), examined the utility of the ordered-tree method in assessing student learning over a semester long course. Naveh-Benjamin et al. (1986) felt the original technique's reliance on participants' abilities to recall information created an underrepresented model of knowledge. To account for recall interferences associated with performance difficulty, Naveh-Benjamin et al. (1986) modified Reitman and Rueter's (1980) technique to provide participants with a bank of course concepts, and asked the participants to order the information. The researchers examined participants' expression of recall orders, hierarchical orders among concept relationships, and the similarity of participant produced ordered-tree models against a model produced by the course instructor. The authors examined correlations among 83 participants using various educational evaluations (i.e., multiple choice, short answer, essay, and final course grade) against an idealized model similarity scores, the results ranged from  $r = 0.23$ ,  $p < 0.05$  (essay) to  $r = 0.51$ ,  $p < 0.01$  (final course grade).

The ordered-tree system has shown utility in assessing concept formation, and has demonstrated applications in assessing student learning in classroom environments and practical settings (e.g., Naveh-Benjamin, McKeachie, & Lin, 1989; Schutz, Drogosz, White, & Distefano, 1998; Winitzky, Kauchak, & Kelly, 1994). While prior versions of the ordered-tree technique advanced assessment methods of content knowledge, it remains limited in a number of ways. First, though the original and subsequently modified methods allow researchers to evaluate stability and directionality of participant recall, the method did not account for communicated directionality that occurs with linear procedures where defined steps exist. For example, in

problem-solving the overall process requires participants to follow an ordered series of procedures (e.g., defining the problem must come before brainstorming). Therefore, identifying correct order of concept placement in procedural steps is required before a correct application of concepts may occur.

Second, while there is an overall direction in many procedural steps, conceivably there are a number of steps that may be re-ordered causing only infinitesimal changes in outcome effects. Though process integrity is a critical component within consultation, strict adherence to implementation is unnecessary (APA, 2005; Brown & Schulte, 1987). For example, Brown and Schulte (1987) noted that within the consultation process, the consultant holds many roles, one of which is to maintain the consultee's confidence and interest in the consultation process. One sanctioned method of maintaining the consultee's motivation is to vary the approach to consultation, which would inherently involve adherence deviations (Brown & Schulte, 1987). Additionally, of the intervention components, not all are required to create desirable outcomes (Durlak & DuPre, 2008; Peck, Killen, & Baumgart, 1989). With appropriate clinical expertise, components of the intervention may reasonably be reorganized or otherwise modified while retaining the overall integrity of the intervention (American Psychological Association [APA], 2005; Durlak and DuPre, 2008). In 2008, Durlak and DuPre found variations in implementation integrity across a series of reviewed studies noting, "perfect or near-perfect implementation is unrealistic." (p. 331). Durlak and DuPre went on to note that implementation levels of less than 80% are common, and that positive results were obtained in the reviewed studies with implementation levels at approximately 60%. Therefore, reasonable modifications of the problem-solving process can remain functionally correct. By identifying acceptable alternative patterns to the ideal ordered-tree model, researchers are able to identify participant-ordered-tree

models that signify a practical understanding of the overall act of problem-solving. Modifying the technique to allow practical alternatives would represent an improvement in correct model identification, where the emphasis is placed on the overall idea, as opposed to technical placements of steps.

Third, prior versions of the ordered-tree technique analyzed data dichotomously, while useful for discrete data patterns, these techniques do not account for data systems where minor misplacements of steps in a linear order represent a smaller degree of error in understanding the process than major reconfigurations of steps. In problem-solving, as in many other process-oriented procedures, a completely disordered system of steps could represent the model of a participant who has limited exposure to the problem-solving process, whereas a model with minor variations in procedural detail could represent a participant with increased familiarity with the overall intent of the process.

Fourth, while the original version of the ordered-tree method required participants to utilize free-recall procedures (Reitman & Rueter, 1980), Naveh-Benjamin et al. (1989) modified the technique to allow participants access to the concept item pool but did not account for chance identification of correct tree structure. Providing participants access to the item pool may account for working memory interferences arising due to anxiety or other performance-related issues; however, providing an item pool also increases the probability that correct order placement may occur due to chance effects.

Finally, while nearly all of the prior studies utilizing the ordered-tree technique examined converging evidence of learning and retention effects using various comparative standards (e.g., comparison to instructor tree, correlation of tree structure with course grade or concept map), none of the prior studies included a measure of participant adherence (or integrity check), where

participants are asked a series of questions following tree orders to estimate the degree to which participants attended to the task at hand.

### **Prior Work**

In a prior study, Lee et al. (2012) examined knowledge transfer among participants by having participants view a condition-specific video. The study contained three conditions including a consultation process, didactic training, or a control video. The consultation process and didactic conditions exposed participants to the problem-solving process. The consultation process condition included a video of a consultant and consultee engaging in the problem-solving process. In the consultation process video, the consultant used overt process statements as recommended by (Cleven & Gutkin, 1988) and modeled the EBC process. The didactic condition provided information on the problem-solving process to participants using a voice-over PowerPoint format in a fashion that resembled a traditional lecture or professional development session. Participants in the control condition viewed a video of two individuals discussing an educationally related problem without components of the problem-solving process. The researchers administered measures of participant recall of the problem-solving process before, and again following, video sessions. The study design allowed comparisons within and between subjects, and indicated that the participants in the didactic and consultation process conditions recalled significantly more about the problem-solving process when compared to participants in the control condition.

Work by Lee et al. (2012) provided evidence of TPSP. Lee et al.'s (2012) work even suggests the possibility that exposure to the consultation process may be more effective in recall of the problem-solving process than exposure to the didactic condition. The author's reported a medium to large effect between the consultation process and didactic conditions ( $d = 0.72$ ).



Despite the substantial effect size in the data, the results between the consultation process and didactic conditions were not significant. The authors also examined two demographic questions (i.e., professional license and years of experience) with no significant differences within demographic groups shown. However, due to the low number of participants involved in the study, power was low and additional exploration is required before a decisive conclusion about the roles of these variables is possible. The study by Lee et al. (2012) also contained a potential confound, in that the use of a pretest to measure participant knowledge of problem-solving process in this study may have primed participants to focus on elements during the study thereby inflating the results. Finally, the prior work would have added to the existing literature base by examining if exposure to the problem-solving process is associated with subsequent changes in participants' self-reported orientation to the problem-solving process.

### **Purpose and Importance of the Current Study**

This study seeks to answer the calls of prior researchers (Fuchs & Fuchs, 1989; Kratochwill et al., 1998; Noell & Witt, 1996) to examine if exposure to the consultation process will lead to improved problem-solving skills among consultees (Albee, 1968; Alpert, 1976; Briesch et al., 2013; Brown & Schulte, 1987; Caplan, 1970; Gutkin & Curtis, 2008; Gonzalez et al., 2004; Macklem & Kalinsky, 2000; Sugai & Tindal, 1993; Zins & Ponti, 1996). While researchers have attempted to provide evidence of TPSP to consultees, the existing evidence supporting this claim has significant limitations (Cleven & Gutkin, 1988; Kratochwill et al., 1998; Lewis & Newcomer, 2002; Noel & Witt, 1996).

This study will expand upon the existing knowledge base in the area of TPSP through consultation by examining participants' immediate recall of the problem-solving process following exposure to a standardized experimental condition. This study will also examine if

exposure to the experimental conditions is associated with differences in participants' orientation to the problem-solving process. These questions are important to examine because the findings may have implications for current consultation practices and recommendations. Specifically, if the results fail to support consultation's second goal, then perhaps alternative techniques or procedures may need to be incorporated in order to support this goal.

### **Hypotheses**

1. Participants in the consultation process and didactic conditions will demonstrate more advanced knowledge of the problem-solving process, as measured by the ordered-tree analytic method, when compared to participants in the control condition.
2. Participants in the consultation process condition will obtain higher scores on a measure of process knowledge than participants in the didactic condition.
3. Participant self-reported prior experience as an educator will not influence recall of the problem-solving process as measured by the ordered-tree analytic method.
4. Participants exposed to the problem-solving process in the consultation process and didactic conditions, will obtain higher scores on a measure of social-problem-solving orientation than participants in the control condition who are not exposed to the problem-solving process.
5. Participants in the consultation process condition will obtain higher scores on a measure of social-problem-solving than participants in the didactic condition.

## Chapter 3: Method

### Participants

Participants recruited for this study reported holding experience working in education as a licensed educator and came from a third-party online recruiting organization. The name of this study, a short description of the purpose and procedures, and compensation information were listed on the Qualtrics website (Qualtrics, n.d.). To participate in the study, participants were required to be aged 18 or older, hold proficient abilities in reading and understanding spoken English. Additionally, participants were selected if they reported prior or current licensed experience as an educator.

### Instruments

The internet-based company Qualtrics was used to recruit participants and administer the experiment related materials (Qualtrics, n.d.). Participants completed a short demographic questionnaire, a modified version of the ordered-tree recall technique (Naveh-Benjamin et al., 1989), and a modified version of the Social Problem-Solving Inventory – Revised (SPSI-R, D’Zurilla et al., 2002).

*Qualtrics.* Qualtrics is an internet-based organization that assists in participant recruitment, study administration, and participant compensation (Qualtrics, n.d.). Research on data collected using participants from online participant pools has shown that participant samples obtained online are more demographically diverse when compared to traditional college-based samples (Berinsky, Huber, & Lenz, 2012; Buhrmester, Kwang, & Gosling, 2011; Gosling, Vazire, Srivastava, & John, 2004) with online participants generally producing accurate and reliable results (Berinsky et al. 2012; Buhrmester et al., 2011; Gosling et al., 2004; Litman, Robinson, & Rosenzweig, 2014). Though participants will be compensated for their time, prior

research has shown that compensation rates for participants obtained through online sample pools do not appear to affect data quality (Berinsky et al., 2012, Bohannon, 2011; Buhrmester et al., 2011) with an exception noted by Litman et al. (2014) who found that data quality is not reliably affected when paying five cents or more for a six-minute task, or approximately \$0.0083 cents per minute. Prior research using participants from online pools (e.g., Berinsky et al. 2012; Buhrmester et al., 2011; Gosling et al., 2004; Litman, Robinson, & Rosenzweig, 2014) have also demonstrated approximately even distributions of male and female participants.

*Demographic questionnaire.* The demographic section included six questions regarding participant, sex, age, highest obtained educational level, experience with identified grade levels, educational license held, and number of years of experience as an educator, (see Appendix A).

*The ordered-tree analytic method.* The ordered-tree analytic method (Reitman & Rueter, 1980; Naveh-Benjamin et al., 1989) provides a quantitative estimate of a participant's knowledge, ordering, and relational grouping of conceptual ideas, and was used to examine participant retention of problem-solving concepts in this study. The ordered-tree analytical method allows researchers to record a participant's knowledge recall, and illustrate a participant's mapping of relationships among concepts (Reitman & Rueter, 1980). The ordered-tree analytical method assumes individuals organize related concepts into hierarchies that contain chunks of related information. The ordered-tree analytic method assesses participant breadth and depth of knowledge. The method assesses these levels of knowledge by providing participants with a concept, and then asking the participant to begin naming related information by free recall until they have exhausted all related concepts. Participant concept formulations typically contain higher-order concepts that comprise lower-order concepts. To identify participant formulations of hierarchies, and concept relational directionalities, Reitman and Rueter used an algorithm

across multiple participant trials. The algorithm allows researchers to identify unidirectional, bidirectional, and non-directional organization patterns by tracing participant recall orders. Unidirectional responses are identified when a participant consistently recalls a cluster of concepts in the same order (e.g., Trial 1 = ABC, Trial 2 = ABC). Bidirectional patterns are identified when participants consistently begin a recall cluster with either the first or final concept (e.g., Trial 1 = ABC, Trial 2 = CBA). Finally, non-directional systems are identified when a participant produces inconsistent recall orders for a cluster of items (e.g., Trial 1 = ACB, Trial 2 = BAC). The ordered-tree analytic method has been modified for educational applications, and has demonstrated utility in measuring concept relationships, ordering sequencing, and stability (Naveh-Benjamin et al., 1989).

While the ordered-tree analytic method has been modified previously (e.g., Naveh-Benjamin et al., 1986; Naveh-Benjamin et al., 1989), further modifications are required for this study. Prior versions of the ordered-tree technique scored data as wholly correct or incorrect (Naveh-Benjamin et al., 1986; Naveh-Benjamin et al., 1989, Reitman & Rueter, 1980, Winitzky et al., 1994). However, in problem-solving, as in many other process-oriented procedures, a completely disordered and perfectly correct system of steps represent two extremes of participant familiarity with model concepts, whereas a model containing slightly disordered variations in procedural detail, perhaps due to an earlier step being incorrectly placed, likely represents a participant with an imperfect, yet reasonable understanding of the overall intent of the process. Therefore, to provide partial credit, responses were scored using the Ideal Point Proximity Measure (IPPM, Lee et al., 2012). The IPPM is described in detail later in this section; however, generally it allows researchers to identify how close the order of the problem-solving steps

generated by the participant is to the ideal order developed by the researchers. The ordered-tree analytical technique requires approximately 1 to 2 minutes to complete.

*The Social Problem-Solving Inventory – Revised.* A modified version of the Social Problem-Solving Inventory – Revised (SPSI-R, D’Zurilla et al., 2002), was used to assess participants’ orientation toward problem-solving. Instructions from the SPSI-R were modified to conform with an online administration. The SPSI-R is recommended for use when measuring a number of applied and research contexts, especially when monitoring change (D’Zurilla et al., 2002). The SPSI-R comprises five scales providing information about an individual’s social-problem-solving orientation and can be used to identify specific areas of change (D’Zurilla et al., 2002). Participants completing the SPSI-R are instructed to rate their problem-solving orientation using a five-point Likert scale (Likert, 1932). Individuals obtaining a higher total score endorse higher knowledge and use of adaptive problem-solving skills when compared to lower scoring individuals. The five scales of social-problem-solving as measured by the SPSI-R include two adaptive and three maladaptive scales. The adaptive scales include 1) Positive Problem Orientation (PPO), and 2) Rational Problem Solving (RPS). While the maladaptive scales include 1) Negative Problem Orientation (NPO), 2) Impulsivity/Carelessness Style (ICS), and 3) Avoidance Style (AS).

The PPO scale contains five items and provides a measure of constructive problem-solving. Individuals scoring high on this scale view problems as solvable challenges containing potential opportunities, they are confident that they will be successful in solving problems. High scorers on the PPO scale anticipate that problems will require time and resource investment; consequently, when faced with challenges, they commit themselves and their resources in such efforts. Individuals obtaining high scores on this scale are less likely to perceive problems as

troubling, more likely to attack problems immediately, and more likely to outperform peers in problem-solving.

The RPS scale contains 20 items and is the most extensive scale of the SPSI-R. The RPS scale allows individuals to rate the degree to which they engage in evaluation, planning, systematic execution, and monitoring of problem-solving approaches. This scale examines endorsement of knowledge and implementation of effective problem techniques when facing problems. The RPS scale is exceptional among the SPSI-R scales in that it is the only scale containing subscales. The four subscales within the RPS address executive aspects and actionable steps of the problem-solving process. Each subscale consists of five items and are identified as the Problem Definition and Formulation (PDF), Generation of Alternative Solutions (GAS), Decision Making (DM), and Solution Implementation and Verification (SIV) subscales. The PDF subscale measures the participant's self-reported proclivity to identify problems, goals in resolving the problem, while assessing factors that influence the problem including factors that prevent a successful resolution of the problem. On the GAS subscale participants rate the degree to which they make efforts to view the problem from novel perspective, engage in strategies that assist in identifying multiple solutions until they have exhausted all options, and then combine the alternative solutions into a new solution that will assist them in resolving the problem. The DM subscales provides a measure of participants' efforts to systematically examine and weigh various solutions while considering potential consequences each solution might create. The final subscale composing the RPS scale, the SIV, allows respondents to report the degree to which they plan implementation efforts and examine the outcomes resulting from their selected solution to determine if the outcome is desirable. If the outcome resulting for the selected solution is

undesirable, then the SIV subscale measures the degree to which respondents consider what the identified problem might require in order to successfully resolve the problem.

The NPO scale characterizes maladaptive perceptions of the problem-solving process. Questions on the NPO inquire about the respondent's emotional state when faced with problems; individuals obtaining high scores on the NPO scale are more likely to experience negative emotional states when faced with problems. These individuals have a pessimistic view of their problem-solving abilities, view problems as a potential threat to their wellbeing, experience greater emotional discomfort when met with problems, and become exasperated when facing problems compared to individuals obtaining low scores on this scale. Due to their dysfunctional perceptions and beliefs, individuals scoring high on the NPO scale are less likely to solve problems effectively than are those scoring lower on this scale.

The ICS is a measure of poor problem-solving patterns. Individuals obtaining high scores on this scale, approach problems impetuously and rush through problems, doing so while holding an incomplete view of the problem and the problem-solving process. Because their understanding of the process is incomplete, when generating solutions these individuals consider few alternatives, and minimally conceptualize potential outcomes. Individuals scoring high on the ICS haphazardly monitor the implementation process, and irregularly evaluate process outcomes. Due to the constellation of maladaptive views and incompetent skills, individuals scoring high on this scale are typically ineffective in problem-solving.

The final measure of maladaptive problem-solving on the SPSI-R measure is the AS scale. Individuals endorsing high scores on the AS scale are characterized by avoidance, inaction, and deferment to others. These individuals depend on others to solve problems for them, they will attempt to place responsibility for problem-solving on others, and if others are



unavailable or unwilling to assist them, they avoid the problem as long as possible. When these individuals finally do attempt to solve the problem, they have procrastinated for too long to take appropriate actions and a desirable solution is unlikely to result. Like the NPO and the ICS scales, individuals obtaining high scores on the AS scale are more likely to be ineffective problem solvers.

The SPSI-R manual reports coefficient alpha properties that include young adults (17 to 39 years), middle-age adults (40-55 years), and elderly adults (60-80 years) (D’Zurilla et al., 2002). Coefficient alpha estimates of the SPSI-R total score range from .85 to .96 (D’Zurilla et al., 2002). Scale estimates of coefficient alpha range from .60 on the PPO scale to .95 on the RPS scale (D’Zurilla et al., 2002). Test-retest correlations (Pearson’s  $r$ ) examined a subset of participant responses ( $N = 359$ ) over a three to six-week time span for the young adult group (D’Zurilla et al., 2002). The SPSI-R total score test-retest correlation coefficient was .87, while scale score coefficients ranged from .72 on the PPO scale to .88 on the NPO scale (D’Zurilla et al., 2002). In addition to the test-retest coefficients presented by the test authors, the SPSI-R has evidenced continued resistance to test-retest effects when independently examined (Nezu et al., 1998).

In the measurement of social-problem-solving, the SPSI-R manual reports suitable evidence of construct and criterion validity (D’Zurilla et al., 2002). The test authors have subjected the SPSI-R to quantitative analysis including maximum-likelihood confirmatory factor analysis, and inter-factor correlations, as well as convergent and discriminant studies using measures that include locus of control (Rotter, 1966), information processing styles under stress and coping situations (Burns & D’Zurilla, 1999), coping strategies (D’Zurilla & Chang, 1995), and academic achievement respectively. In all studies, the results provide empirical support for

the SPSI-R as a 5-factor model of social-problem-solving that is appropriately congruent from other measures of psychological constructs related to social-problem-solving.

Select items from the SPSI-R were judged to be irrelevant to the purposes of this study and therefore were excluded from administration. Items were excluded if the items 1) addressed emotional content not addressed in the modified version of Heppner's (1978) model, 2) included references to practices inconsistent with the model used in this study, 3) address past behaviors, or 4) conflict with the nature of the consultation process. For example, the modified version of Heppner's (1978) problem-solving process does not widely address emotions connected to the problem-solving process, nor are participants expected to suddenly overcome a history of emotions such as depression or anxiety associated with solving complex problems based on one exposure to a modified version of Heppner's process. Items inconsistent with the problem-solving practices included behaviors such as combining multiple solutions into one and practicing solutions before implementing them. Items addressing a pattern of past behaviors are phrased in a way that they may cue participants to think of ways in which they previously responded to solving complex problems and may not reflect changes resulting from exposure to the problem-solving process. Items addressing patterns of past behaviors include phrases such as preferences in dealing with problems, descriptions of past behaviors, and perceptions of past performance, these items are not expected to be immediately affected by exposure to the problem-solving process. Finally, one item was identified as conflicting with the nature of the consultation process by rating participants more poorly if they endorse seeking help from someone else in solving a problem. An implicit assumption within consultation, is that the consultee should seek help, particularly from those with related expertise when confronted with a difficult problem, therefore the consultation process does not reprimand or otherwise punish

consultees for seeking help. The pool of omitted items contained eight items from the NPO scale, five items from the AS scale, four items from the RPS scale, and three items from the ICS scale for a combined total of 20 items omitted from the original scale. After data collection has completed, participant responses on items from the modified SPSI-R were analyzed using coefficient alpha (Cronbach, 1951) to determine if the scale continues to hold reliability estimates similar to those reported by D’Zurilla et al. (2002).

The authors of the SPSI-R constructed the items at a fourth-grade reading level, writing in a North American English dialect. The assessment is appropriate with English speaking individuals 13-years-old or older, and the manual permits group and remote administration scenarios. To administer or score the SPSI-R, the test authors require no specialized training or qualifications. MHS has granted permission to transcribe the items to an electronic format and administer the measure using secured internet-based survey software (personal communication, October 18, 2016). Administration of the complete SPSI-R measure can be completed in approximately 15-20 minutes, while the modified version requires approximately 10-15 minutes to complete.

## **Procedures**

*Precondition procedures.* Participants came from the Qualtrics participant pool and were randomly assigned to one of the three experimental conditions. Participants completed an informed consent document approved by the Human Research Protection Program at the University of Kansas. The informed consent document contained information regarding participant rights, procedures for obtaining additional information regarding study outcomes, and methods for having their information removed from the results (see Appendix C). After

participants consented to participate in the experiment, they completed a demographic questionnaire and were then randomly assigned to one of three experimental conditions.

*Consultation process condition (condition one).* Participants in the consultation process condition viewed a 15 minute and 20 second video simulating a consultation session between a psycho-educational consultant, and a general education teacher. In the consultation process video, the actors assume the role of educational professionals where the general education teacher requests a consult for an identified problem. The psycho-educational consultant uses the problem-solving process (Gutkin & Curtis, 2008; Heppner, 1978) to address the problem. Following recommendations by Lee et al. (2014), the consultant creates a calm atmosphere by downplaying the crises and being empathetic. The consultant compliments the consultee for approaching the task head on, and normalizes the problem the consultee is experiencing by stating that “Problems like these happen frequently, especially for educators.” The consultant also avoids identifying an immediate solution before the problem-solving process is complete (Lee et al., 2014). Throughout the consultation process, the consultant emphasizes overt-process statements (Cleven, 1987; Cleven & Gutkin, 1988) to signal transitions to the consultee and remind her of important steps in the process. Examples of overt-process statements used by the consultant in this study include the following.

- First, we are going to define the problem behavior, and in doing so we will go through and define the actual aspects of the behavior. Here we will talk about things that occur before, during and after the behavior.
- Then we will talk about your goals for the behavior, some of the big picture aspects of the behavior, what might be causing this behavior, and we will brainstorm a list of possible solutions to the problem.

- Once we have a nice list of possible solutions we will consider what might work best, and how the selected solution(s) will help us meet your goal.
- Finally, we will talk about responsibilities for implementing the solution... Okay, so let's define the problem you are having with Mark clearly and in a way that anyone could see it.
- I feel like we have a pretty clear definition of the behavior, I mean Mark is frequently getting out of his seat during inappropriate times and is causing a distraction in your class. Next, I would like for you to describe for me what happens immediately before Mark leaves his seat.
- (N)ow that we have defined the problem behavior, and have discussed what seems to trigger the behavior as well as what tends to occur following the behavior, I feel like we have a pretty good understanding of what is going on.

See Appendix D for the complete transcript.

*Didactic condition (Direct training in problem-solving - condition two).* Participants in the didactic condition viewed a 6 minute and 40 second voice-over PowerPoint video. The PowerPoint video contained audio and visual cues designed to instruct participants in a modified version of Heppner's (1978) problem-solving process. The slides in the PowerPoint video contained key words of the modified problem-solving process accompanied by an audio description and explanation of the key words (see Appendix E for a transcript).

*Control condition (condition three).* Participants in the control condition viewed a 12 minute and 30 second video containing two individuals assuming an educationally-based professional role and discussing classroom-based behavioral problems. The individuals in the control video chat about the child and the educator's view of the problem without discussing

Heppner's (1978) problem-solving process or using overt-process statements (Cleven & Gutkin, 1988). See Appendix F for a full transcript of the control condition video.

### **Post Condition Procedures**

Following the condition specific video, participants from all conditions were instructed to complete the ordered-tree analytical technique. The ordered-tree analytical technique requires approximately one minute to complete. All participants in this study were provided a list of steps that correspond to the modified version of Heppner's (1978) problem-solving process utilized in this study. The problem-solving steps were scrambled in a random order using a random numbers table. Participants were asked to use the scrambled steps to complete the ordered-tree analytical technique by organizing the steps in the sequence that is the most logical to them. Once participants viewed condition specific videos, they completed the ordered-tree assessment, and the SPSI-R (modified). Participants then viewed the debriefing statement and were thanked for their participation (see Appendix G).

### **Procedural Summary**

Qualtrics was used to recruit and administer the components of this study. Information describing this study, estimated completion time, compensation rates, and requirements were listed on Qualtrics's website, where interested participants were able to select this study to participate. Individuals who agreed to participate in this study were presented with an informed consent statement reviewing their rights as a participant. Once participants have completed a demographic questionnaire they were automatically and randomly assigned to one of three conditions. Participant required approximately 30 minutes to complete the entire study. This estimate includes 1 minute or less to complete the demographics questionnaire, approximately 6-15 minutes to complete the condition specific video, 1 - 2 minutes to complete the ordered-tree

technique, and 10-15 minutes to complete the SPSI-R (modified). Participants completing the study were compensated for their time following compensation rates previously determined by the Qualtrics organization. For an overall representation of the procedures that were used in this study see Table 3.

### **Data Preparation**

*Missing data and attrition rates.* The data were examined for missing at random, as well as not at random (Heitjan & Basu, 1996; Rubin, 1976). Work by Zhou and Fishbach (2016) suggests that participants are less likely to complete studies requiring lengthy writing tasks or tasks requiring higher levels of cognitive effort. This study does not require significant cognitive or writing efforts, therefore self-selection effects due to the ease of the presented tasks are unlikely to play a key factor in missing data. However, the work by Zhou and Fishbach (2016) might suggest that participants may withdraw from a study when the study is viewed by the participant as too long. Participants in the longest condition (i.e., Consultation process) are expected to require approximately 30 minutes to complete the study, which is approximately six minutes longer than the shortest condition, and consequently may be more likely to leave the study before it is completed. Efforts were taken to reduce the likelihood that participants would exit the study before completion. These efforts included listing one description for the study, identifying that the study will require approximately 30 minutes to complete. The survey software used in this study did not allow participants to progress through questions until all responses were addressed; however, participants were able to withdraw from the study at any time resulting in incomplete response options. Thus, the results were analyzed for missing not at random data by analyzing incomplete responses from participants across conditions. Attrition

rates were compared across conditions to determine if the conditions that require more participant time (i.e., Consultation process) have higher attrition rates than the other conditions.

*Item scoring and conversion procedures.* The modified SPSI-R responses were scored using the directions outlined in the SPSI-R manual (D'Zurilla et al., 2002) as a guide. Items from the SPSI-R were grouped, summed, and averaged within their respective scales (i.e., PPO, RPS). Summed scores for the maladaptive scales must be transformed before summing the scales in order to obtain the total raw score. This study used a modified version of the SPSI-R, consequently, the original transformation process of certain scales required modifications so that the scales are appropriately weighed for the transformation. For example, the ICS scale on the original measure contains 10 items with each item rated on a scale of 0 to 4. The transformation procedure accounts for the 10 items by subtracting the total scale score by 40, with 4 points being subtracted for each item included on the scale. However, the modified ICS scale contained only 7 of the original 10 items; therefore, the summed scale score was subtracted by the product of 7 items by 4 points (4 x 7) or 28 points. This process was also followed for the NPO and AS scales. The NPO scale contained 2 of the original 10 items; therefore, in order to appropriately adjust for the item deletions, the scale score was subtracted by the product of the 2 items by 4 points, or 8 points total. The AS scale also maintained only 2 of the original 7 items which also means that the scale should be subtracted by 8 points in order to properly complete the transformation. Following the scale transformations, the scale scores were recorded and summed across all scales to obtain the total raw score for each participant.

*Scoring correct response sequences.* In problem-solving, steps must be completed in a particular sequence in order to result in a valid outcome. However, while the problem-solving process used in this study holds an overall sequence, participants could conceivably alter the



sequence of a number of the problem-solving steps while still arriving at a valid outcome (Pretz et al., 2003). There are five prominent steps contained in the problem-solving construct contained in Figure 2. Each step of the problem-solving process contains critical elements of the process. Work by Heppner (1978) and Gutkin and Curtis (2008) indicate that the problem-solving process could be traversed exactly in the order shown in Figure 2, or as Pretz et al., (2003) discuss, problem-solving steps may be accomplished through multiple avenues. Indeed, fluent problem-solvers are flexible in their understanding and use of the process; consequently, flexibility in analysis of responses is required to maintain conceptual integrity. Lee et al. (2012) identified reasonable reconfigurations of the problem-solving process that are not expected to interfere with process outcomes (see Figure 2). The illustrative demarcations contained in Figure 2 identify the order in which the steps and subsequent elements must occur. Single headed arrows in this illustration indicate unidirectional steps are required, while dual-headed arrows connect steps that may be reconfigured to occur in any order.

Finally, the ordered-tree analytic technique used in this study includes an item pool. The item pool is expected to decrease the probability that participants' knowledge structures are underrepresented (Naveh-Benjamin et al., 1989) and is expected to create a model that is more representative of the participants' knowledge structure. However, the introduction of an item pool is likely to increase the probability that participants will obtain higher correct scores due to correctly selecting items by chance. In order to account for chance selection effects, the IPPM was used to ensure proper scoring of items (Lee et al., 2012).

*Ideal point proximity measure.* The Ideal Point Proximity Measure (IPPM, Lee et al., 2012) was used to score and analyze information due to specific advantages it provides. The IPPM allows researchers to identify multiple correct placements for a specific item, item distance

from the ideal item placement, all while accounting for the increased probability that multiple correct response options introduces. For example, Lee et al. (2012) previously identified steps 1, 2, and 3 in Figure 2 as being able to occur in any order without resulting in a significantly altered outcome. Using the work by Lee et al. (2012) and steps in Figure 2 as a scoring example, participants may place steps 1, 2, and 3 in any order within the first 3 spots (e.g., 3, 2, 1 or 2, 1, 3, or 1, 3, 2) and still receive the same score as a participant who ordered the steps as 1, 2, 3. The IPPM allows researchers to identify these response options as correct so that the participant is not penalized incorrectly because of a minor, though reasonable, item misplacement.

The IPPM also allows researchers to identify the distance of an incorrect response from an ideal response and account for this in a participant's score. As an illustration, consider the sixteen-step process identified in Figure 2. Using factorial computation, the 16 problem-solving steps identified in this study create  $2.09227899 \times 10^{13}$  possible orders. However, of all of the potential orders identified, only a few of the orders are correct. Yet, of the incorrect model variations some solutions more closely resemble an accurate solution than others.

Again, using the steps in Figure 2 as an example, a participant placing step 15 in the location where step 5 is intended to occur holds a conceptualization of the model that is likely less developed than a participant who places step 15 in the location for step 14. In this example, both models are technically incorrect, yet the participant placing step 15 in step 14's location holds a conceptualization that is a closer approximation to the correct solution and under certain circumstances may produce an outcome that is not significantly different than an outcome produced by someone following the correct model sequence. The IPPM allows researchers to identify and award partial credit for a response based on the proximity of the response's location

to the ideal location. The scoring system yields higher scores when a step is placed closer to the ideal point.

Additionally, the IPPM accounts for random selection effects. In this study, participants were provided an item pool containing key words from the problem-solving process. Participants used the scrambled key words presented to them and sequenced the items in a manner that represents their understanding of the process order. To account for chance selection effects, the IPPM adjusts item scores based on the number of available response options to prevent artificially inflated results.

To compute a participant's IPPM score, first the participant's item level scores must be computed. An item's score is computed using the formula for  $P_{ij}$  which is represented in Figure 3. In an identified participant's response, the symbol  $X_{ij}$  represents placement of item  $j$  by participant number " $X$ " where " $i$ " represents the participant's identification. For example, in the case of participant two's placement of item 3,  $i$  is replaced by the number 2 (participant identification number), while  $j$  is replaced by item 3. Using this sequence, researchers are then able to compute participant two's score on item 3 into a proportional proximity, where  $P_{ij}$  signifies the distance of the respondent's choice ( $X_{ij}$ ) from the ideal point ( $I_j$ ). In the example of participant two's placement of item 3, and again using Figure 2 as an example, imagine that the participant placed item 3 in the location for item 4. Because item 4 was previously identified as an incorrect ordering for item three (Lee et al., 2012), the distance of item three's location from the ideal point is computed and the absolute value of the difference is taken, in this case  $|4 - 3| = 1$ . Next, the absolute difference score, in this case 1, is added to  $c_j$ , the number of correct response options for item three. Again, using the work by Lee et al. (2012) item three contains three plausible options (items one, two, or three), therefore in this case  $c_j = 3$ . The computation

therefore becomes  $1 + 3 = 4$ , and the numerator portion of the equation is complete for the second participant's placement of item 3.

The response process is designed so that participants are able to select responses from an available pool of items, which results in an increased probability of correctly identifying the answer by chance. Consequently, the IPPM corrects for guessing by dividing the numerator by the number of available response options ( $N$ ). Continuing with participant two as an example, because there are 16 response options,  $N$  is replaced by 16. The score obtained in the numerator (4) is then divided by the denominator (16), which equals 0.25. Finally, the obtained score is subtracted from 1 so that higher scores indicate a closer approximation to the ideal point, and thus a better score. Completing the computation  $1 - 0.25 = 0.75$ . Thus, participant 3's score for placing item 3 in item 4's location is 0.75. Scores on the IPPM may range from a negative value to 1; however, due to guessing corrections, IPPM scores cannot equal exactly 1. The notation ( $j = 1 \dots N$ ) in the numerator indicates that the computation process repeats until all item scores have been computed for the identified participant.

Item level scores for each participant are individually scored then combined to create an IPPM total score for each participant. In the case of participant two, the responses for each item continue to be calculated until all of the item scores have been computed. Once all item level scores have been calculated, then the item level scores are combined to create an overall score for participant two. The formula used to complete the IPPM algorithm and create an overall IPPM score is represented by Figure 4. Where " $P$ " represents the identified participant, " $j$ " represents the item scores, and " $N$ " indicates that the item scores for the participant are summed together until all of the item scores have been included in the computation.

## Study Design and Proposed Analysis

This study examines the effect of exposing participants to the problem-solving process influences participant scores on the ordered tree analytical technique and the SPSI-R (modified). The dependent variables were collected from participants after they viewed the video associated with their assigned condition (see Table 3). Scores from the dependent variables were compared across the three conditions. Consequently, a stepdown Multivariate Analysis of Variance (MANOVA) was planned where the three experimental conditions (consultation process, didactic, and control), represent the three levels of analysis.

Statistical assumptions required by the MANOVA technique include absence of missing data, normality of the sampling distribution, absence of univariate or multivariate outliers, homogeneity of the variance-covariance matrices, linearity, absence of multicollinearity, and singularity (Tabachnick & Fidell, 2007). Normality is examined using the Kruskal-Wallis test. Homogeneity of variance is examined using Levene's test. Mahalanobis distances among participants is examined to assess the absence of multivariate outliers. Linearity is examined by conducting separate scatterplot matrices between dependent variables for each of the three conditions. Multicollinearity is assessed by conducting correlations among the dependent variables to determine if the dependent variables correlate at a level of 0.80 or higher. Finally, equality of covariance matrices is examined by running a Box's M test and searching for  $p$  values below .01. If assumptions are met, the omnibus  $F$ -test is examined to determine if the results are statistically significant. After running the initial analyses, when it is clear that the dependent variables are uncorrelated, then a separate Analysis of Variance (ANOVA) is conducted to determine if the scores from the ordered tree analytic technique, and separately SPSI-R (modified) are significantly different across groups. When this occurs, then following

the initial omnibus analyses if the results are statistically significant, additional post-hoc comparisons are conducted. The additional analysis include simple pair-wise comparisons across groups to determine the direction of the results.

*Power analysis.* G\*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007; G\*Power, 2016) is a software program used by researchers to determine the necessary sample size in order to detect the presence of an effect. G\*Power requires the researcher to identify the intended statistical test and related variables such as the number of independent and dependent variables. G\*Power also requires users to provide an effect size estimate based on information derived from prior studies as well as theory (G\*Power, 2016). This study utilized a MANOVA to compare results across 3 conditions, and 2 response (dependent) measures. Using the MANOVA: Global effects statistical test in the G\*Power software with an effect size, based on prior work by Lee et al. (2012), of  $f = 0.51$ ,  $\alpha$  probability error of 0.05, and a power (1- $\beta$  error probability) of 0.95, the power analysis indicated that a total sample size of 21 participants is required to detect an effect.

Though the initial omnibus testing requires only 21 participants to detect the presence of an effect, if the results of the MANOVA analysis indicate a statistically significant finding, then a follow up  $t$  test between the consultation process and didactic conditions is required to determine if the differences between these two groups is statistically significant. To determine the number of participants required to detect a statistically significant result, the effect size reported by Lee et al. (2012) between the consultation process and didactic conditions ( $d = 0.72$ ), was entered into the G\*Power software using the  $t$  test means setting, an  $\alpha$  probability error of 0.08333, a power (1- $\beta$  error probability) of 0.95, and an allocation ration N2/1 of .98 (to account

for unintended differences in sample size across groups). The result of the analysis revealed 65 participants per group ( $N = 195$ ) is required to detect an effect if present.

## Chapter 4: Results

The results were analyzed to determine the amount of missing and incomplete data in the obtained sample. In the overall obtained sample, 386 individuals attempted the survey; however, of those only 207 individuals completed the study. Of the 179 individuals who did not complete the study, 150 individuals did not previously or currently hold an educational license and therefore were dismissed because they did not meet the minimal requirements for participation. Of the remaining 29 individuals (14% of the final sample) who did not complete the study, all were excluded from the study due to incorrectly responding to a response validity check. Response validity checks were randomly placed among other questions and included directions intended to ensure that respondents were attending to the questions. A response validity item might include “Of the three items below, select the second response.” Individuals who did not follow the directions were exited from the study and did not complete the remaining questions. Of the individuals excluded due to incorrectly responding to a response quality check, five individuals (2% of the final sample) came from the consultation process condition, 12 individuals (6% of the obtained sample) were from the didactic condition, nine (4% of the obtained sample) were from the control condition, and two additional individuals (<1% of the obtained sample) were not assigned to a condition. The data from one additional individual in the control condition were digitally corrupted. The corrupted data were analyzed for patterns indicating that the responses were systematically transformed; however, no pattern was identified and therefore the corrupted data were excluded from the analysis. The missing data do not appear to suggest a systematic pattern that might be linked to condition specific variables (Zhou and Fishbach, 2016). An analysis of participant responses revealed that of the participants who began the study, none voluntarily exited before completing the required responses.



*Participant demographics.* The sampling pool obtained with the aid of Qualtrics, LLC was geographically diverse with participants engaging in the survey from all regions of the continental United States including the Northeast, Southwest, Midwest, South, and West. Of the 207 participants, the majority of participants were female (143). Participant's ages ranged from 22 to 76, with a mean age of 46 years, ( $SD = 13.19$ ). When examined by age range, with most participants ranging from 30-59. Of the participants, 107 reported holding graduate-level training. Participants self-reported experience working in a school setting ranged from one year of experience to 49, the mean experience reported was 16.30 years ( $SD = 11.30$ ). Participants held experience working across all levels of education spanning from preschool through twelfth grade, with 36 participants reporting experience working in special education. See Table 4 for additional demographic information.

*Modified SPSI-R scale analysis.* The items retained for the SPSI-R scale were analyzed using CFA and coefficient alpha techniques (Cronbach, 1951). CFA techniques were used to examine if the modified scale retained the five-factor solution described by D'Zurilla et al. (2002). Using the five-factor independent cluster solution described in the SPSI-R manual, the factors were fitted to the inter-item correlation matrix using maximum likelihood. The results of the analysis revealed levels consistent with those reported in the SPSI-R manual and suggests that the modified scale retains many aspects of the original 52-item scale; see Table 5 for the results, and Figure 5 for an illustration of the model. The coefficient alpha levels reported by D'Zurilla et al. (2002) were also consistent with the current scale (alpha level = 0.85, see Table 6). These findings suggest that the modification did not significantly change the properties of the scale. Item-level coefficients were analyzed to determine the effect of deleting a specific item on the overall scale's coefficient levels, the results indicated that the most significant improvement

in coefficient alpha levels by a single item deletion would result in an improvement of 0.01, suggesting that the retained items remained internally consistent. Item level means for the overall sample ranged from 0.86 to 2.86, see Table 7 for all item level means and standard deviations.

*Analysis of MANOVA statistical assumptions.* Before conducting the MANOVA, the data were first analyzed to detect potential violations of statistical assumptions required of the MANOVA technique. The assumptions required of a MANOVA technique include an absence of missing data, absence of univariate or multivariate outliers, normality of the sampling distribution, homogeneity of the variance-covariance matrices, linearity, and absence of multicollinearity and singularity (Tabachnick & Fidell, 2007). While there were no missing values on any of the dependent variables for the 207 participants; the initial analysis of assumptions evidenced a violation in normality. The groups were separated before analyzing normality so that differences in the groups did not produce artificially inflated results. The analysis of normality evidenced a violation in the Shapiro-Wilk's test ( $p < 0.05$ ) across all conditions on the IPPM total score variable (see Table 8). A visual inspection of histograms by conditions indicated a consistently moderate and negative skew across conditions on the IPPM scale (see Figures 6, 7, & 8). To account for the violation of normality, the dependent variable total scores on the IPPM and SPSI-R were transformed for all participants using the reflect and square root procedure as described by Tabachnick and Fidell (2007). An analysis of assumptions was again conducted using the transformed data.

An analysis of the transformed data using the Shapiro-Wilk's test revealed all dependent variables across all conditions failed to reach significance ( $p > 0.05$ ), with the exception of the IPPM score in the process condition (see Table 9). Though, the  $p$  value remained significant the

transformation did increase the  $p$  value from  $< 0.001$  to  $p = 0.02$ . Additional alternative transformations of the data set did not improve this violation. Because the MANOVA technique is robust to minor violations of the normality assumption (Tabachnick & Fidell, 2007), the data resulting from the reflect stage and square root procedure was used for further analysis.

An inspection of boxplots for values greater than 1.5 box-lengths from the edge of the box revealed an absence of univariate outliers (see Figures 9 & 10). An analysis of Mahalanobis distance values revealed that the largest value was 8.81, this is within the critical value of 13.82 for two dependent variables and indicates an absence of multivariate outliers in the data. In addition to the Shapiro-Wilks significance test, normality of the sampling distributions was assessed by visual inspection of Histograms and Normal Q-Q Plots, and examining the skewness and kurtosis of the dependent variables. Visual inspection of Histograms (see Figures 11-16) and Normal Q-Q Plots (see Figures 17-22) revealed no unexpected aberrations from normality of the sampling distributions. An analysis of skewness and kurtosis scores revealed that both IPPM and modified SPSI-R scores were within negative two and positive two and therefore normally distributed across all conditions (see Table 10). A linear relationship between IPPM and SPSI-R scores were assessed by scatterplot. The results of the scatterplots revealed that there was a linear relationship between IPPM and SPSI-R scores across conditions (see Figures 23-25). Multicollinearity was also assessed by conducting a Pearson bivariate correlation among the dependent variables searching for a correlation exceeding  $r = 0.799$ . Pearson's  $r$  coefficients between the IPPM and the modified SPSI-R scores did not exceed 0.799 ( $r = 0.176, p = .01$ ).

### **Statistical Analysis**

Using Wilk's lambda, the combined effect of dependent variables were not significant,  $F(4, 404) = 2.20, p = 0.07$ . Because the effect was not significant, separate one-way Analysis of

Variances (ANOVAs) were conducted to determine if the independent variables resulted in statistically significant differences across conditions.

*ANOVA analysis of IPPM total scores.* The assumptions required of the ANOVA technique are similar to those of the MANOVA technique including the assumption of normality. Therefore, to meet the assumption of normality the transformed IPPM total scores were used to conduct the ANOVAs. The scores used in the transformed set are reversed, so that lower scores are reflective of higher performance. Levene's test for equality of variances revealed homogeneity of the variances for the transformed IPPM total scores ( $p = .091$ ). Using the transformed IPPM total scores, the results of the omnibus  $F$  test was statistically significant  $F(2, 204) = 3.428, p = .034, \eta^2 = 0.04$ . The Bonferroni test was used for the post hoc analysis to determine if statistically significant differences exist across conditions of the IPPM total score, the significance value was set at  $0.05/6$ , or  $0.0083$  to account for inflated type I errors associated with the increased significance tests. When examining mean scores of the problem-solving process by condition, the results showed that participant performance was lowest in the control condition ( $n = 67, \bar{x} = 1.86, SD = 0.46$ ), slightly improved in the process condition ( $n = 72, \bar{x} = 1.74, SD = 0.47$ ), and strongest in the didactic condition ( $n = 68, \bar{x} = 1.67, SD = 0.39$ ). see Table 11 for descriptive statistics for the IPPM total scores. Though differences in mean scores were noted, post hoc analysis were not statistically significant across any of the comparisons (see Table 12).

*ANOVA analysis of modified SPSI-R total scores.* Because the dependent variable scores were analyzed separately, the original untransformed modified SPSI-R total scores were used for the ANOVA analysis. An examination of the assumptions evidenced no outliers in the modified SPSI-R total scores, as assessed by inspection of a boxplot for values greater than 1.5 box-

lengths from the edge of the box. The modified SPSI-R total scores were normally distributed for the process, didactic, and control conditions, as assessed by Shapiro-Wilk's test ( $p > .05$ ). Levene's test for equality of variances evidenced homogeneity of variances for the modified SPSI-R total scores ( $p = 0.45$ ). The omnibus  $F$  test for the modified SPSI-R total scores across conditions was not statistically significant  $F(2, 204) = 7.45, p = 0.27$ .

## **Chapter 5: Discussion and Limitations**

The problem-solving process is a critical component in school-based consultation (Bergan, 1995; Kratochwill et al., 1989; Lee & Niileksela, 2014; Lewis & Newcomer, 2002; Sheridan, et al., 1996). It seems reasonable that one of the benefits that the consultee might gain by exposure to the consultation process is an improved understanding or skill set in of the problem-solving process. However, the results revealed no statistically significant differences between participant scores across experimental conditions in learning of, or orientation to, the problem-solving process. These findings are unexpected and inconsistent with both consultation theory as well as prior work by Lee et al. (2012) and Watson and Kramer (1995).

Prior work by Lee et al. (2012) provided limited initial support for the idea that exposure to the consultative process improves an individual's understanding of the problem-solving process. The findings by Lee et al. (2012) suggests that exposure to a consultation session likely does more than simply improve the likelihood that a consultee will be able to resolve problems that are similar to ones previously encountered. Rather, Lee et al.'s (2012) findings suggests that exposure to the consultative process improves the consultee's overall understanding of the problem-solving process itself. Furthermore, Lee et al.'s (2012) findings echoed earlier results reported by Watson and Kramer (1995) where the authors similarly found that direct training and exposure to the consultation process resulted in superior abilities in problem identification and analysis over participants in a control group. Yet in contrast to these earlier findings, the current study which retained many methodological components established by Lee et al. (2012) failed to support the idea that exposure to the consultation process either through didactic or modeling methods, results in improved knowledge of, or orientation to, the problem-solving process.

The current study contains a larger sample of participant than the 2012 study by Lee et al. and may only reflect a more accurate representation of these effects within a population. However, there are notable differences between the current study and the study by Lee et al. (2012). One difference that might explain the divergent results is that in the study reported by Lee et al. (2012) the authors included a pretest measuring knowledge of the problem-solving process, whereas the current study did not. Perhaps the listing of key terms in the pretest in the 2012 study primed participants to attend to these phrases during the experimental conditions (Holcomb & Neville, 1990; Tulving & Schacter, 1990). If priming effects influenced participants' behavior during the 2012 study by Lee et al., the results may have artificially inflated scores on the posttest (Lupker, 1984) thereby accounting for the differences between the current study and the one by Lee et al. (2012). Consultants already use priming in the form of overt-process statements and if it true that exposure randomly placed but related key words and phrases improves recall, then this would suggest that consultants should take efforts to mention these terms prior to beginning the consultation process.

A second difference between the two studies is in the demographics of the two samples. In contrast to the work by Lee et al. (2012), the current sample of participants differed markedly in terms of geographic location, average age, and years of reported experience working in education. While it is unclear how geographic location might affect the results of this study, perhaps age and experience might have influenced participants' scores on measures relating to the problem-solving process. The average participant in the current sample was 17 years older than the average participant in the study by Lee et al. (2012). Additionally, participants in the current study reported holding nearly twice as many years of work-based experience (16.30 years) as the participants in the 2012 study by Lee et al. (8.5 years). Older and more experienced

individuals might hold a more sophisticated view of problem-solving skills. If true, then the larger existing knowledge base held by more experience individuals may account for higher scores on a measure of problem-solving knowledge that is independent of the experimental condition.

### **Conclusions, Limitations and Future Directions**

The current results of this study revealed that participants did not improve in their knowledge of the problem-solving process or their general problem-solving orientation after exposure to the any of the study conditions. Consultees benefit from the consultation process by resolving a problem that was presented by the child (Guli, 2005; Kratochwill et al., 1995; Lepage et al., 2004; Mannino & Shore, 1975; Medway, 1979, 1982; Medway & Updyke, 1985; Reddy et al., 2000; Sheridan et al., 2001; Sheridan et al., 2006; Sheridan et al. 1996). However, the idea that consultees gain a secondary benefit by improving their knowledge of, or orientation to the problem-solving process is unsupported by the current evidence. If consultees do gain a secondary benefit from the consultation process, then perhaps it occurs after implementing an intervention or following repeated exposures to the consultation process, neither of which were components of the current study. Consultees who implement an intervention or who have repeatedly experienced the consultation process may have a stronger understanding of the problem-solving process than individuals who have only verbally interacted with the consultee.

However, perhaps the benefit consultees experience is more specific than learning a general problem-solving approach. Perhaps consultees retain applications of specific intervention techniques used in the consultation session and neglect the overall process. For example, if a consultee wishes to resolve a problem that involves a child engaging in a type of avoidance behavior and the consultation process results in an intervention that allows the child to



take breaks, then in the future the consultee might use a similar intervention with other children. In this example, the consultee has gained specific information that may be beneficial in specific future circumstances.

It is important to make a distinction between generally improving problem-solving orientation and skills, and improving the likelihood that an individual will be able to resolve a similar version of a specific type of problem in the future. Improving an individual's general problem-solving orientation and skills requires that individuals modify their attitudes and perceptions of the problems-solving process as well as their behavioral habits, while improving the likelihood that a consultee will be able to resolve an identical type of problem in the future only requires that the consultee accurately recall the solution and hold the motivation to re-implement the prior solution.

Finally, it is important to recognize that this study utilized videos of two individuals modeling the consultation process, while this approach standardizes exposure variables, the result is that participants may not experience the process in the same manner as those who engage in a consultation due to experiencing an actual problem. Individuals who have been frustrated by a difficult problem may experience a different emotional and cognitive response to the consultation process than individuals passively watching two individuals resolve a problem for which they have no personal investment. Consultees who implement an intervention resulting from the consultation process and then observe a previously frustrating problem resolve may come to value the problem-solving process in a manner that is difficult to replicate unless experienced directly.

*Limitations.* The current study contained an experienced sample of educators and did not control for prior experience in the consultation process or in educational problem-solving. It is

possible that prior experience may have been influenced by retroactive interference (Anderson, 2003) which could have resulted in inflated measures of problem-solving knowledge across conditions. Prior experience in consultation would not necessarily be problematic in consultation. If a consultee has had prior experience in consultation, they may require further consults in the future. Consequently, prior experience in consultation would not necessarily indicate the need for immediate dismissal of a participant from a study such as this. However, if the consultee has learned the problem-solving process from a consultation session, then it is less likely that the individual will seek consultation in the future and therefore the individual is not a representative member of the population of interest.

Finally, if participants in this study wished to re-start the video, the technology used in this study could not prevent participants from watching the video as many times as they might wish. Consequently, It is possible that because the participants were not interactive through the process that they did not attend to the process in a way that they would if they experienced the consultation process in person.

*Future directions.* While the results of this study are contrary to the stated hypothesis, the findings suggest many possible avenues for future studies. First, based on the current findings, it might be informative to explore if age and experience might be covariates in benefiting from the consultation process. If subsequent evidence does support the idea that consultees benefit from consultation through an improvement in knowledge or orientation to the problem-solving process, then future researchers might further explore the efficacy of techniques that might improve the consultee's general knowledge of, or orientation to the problem-solving process. It also might be worthwhile to explore if those who seek consultation generally hold problem-solving skills that differ from those who don't seek consultation services. If for

example, individuals who seek consultation hold below average skills or a maladaptive orientation in problem-solving compared to individuals who do not seek consultation, then this would provide basic information regarding the target population that has been previously neglected. Information regarding problem-solving skills and orientation might be useful in future studies in that it would allow researchers to screen individuals who are unlikely candidates for consultation. Alternatively, research in this area might provide useful information regarding the type of information a consultee might seek. For example, while some consultee's might seek consultative services due to deficits in problem-solving skills, others might have an idea regarding potential solutions, but seek services because they might like to explore additional alternatives, or perhaps some consultees might only require assistance implementing an intervention and collecting data.

Another variable of interest might include examining ways to replicate components of this study in the field while controlling for individual effects of the consultant and the nature of the problem addressed in the consultation session. A field-based study might provide findings that are more directly applicable to school-based consultation but would require that the study contain more flexibility to account for extraneous variables introduced by field-based work. Additionally, a field-based study might provide information regarding how resolving a problem that is personally experienced affects an individual's attitudes, knowledge of, and orientation to the problem-solving process. Useful field-based techniques might include Single Case Design approaches (SCD, Kratochwill et al., 2010), using consultant variables use as covariates, or through the use of qualitative research methods. For example, an SCD approach might simultaneously examine classroom management skills or collect recurring measures of the consultee's problem-solving orientation. While other studies might identify contributing factors

to successful consultation and then measure and account for those factors in field-based studies. Finally, a qualitative study might examine the consultee's thoughts and perceptions of the consultation process. A qualitative study may perhaps provide the most fruitful approach. If the evidence from subsequent studies continues to fail to support the contention that consultees gain secondary benefits from consultation, then a qualitative study would allow an open examination of this idea. Perhaps consultees do gain a secondary benefit from engaging in consultation, but the benefit occurs in a manner that is not clearly understood by current theories of consultation.

## References

- Acton, W. H., Johnson, P. J., & Goldsmith, T. E. (1994). Structural knowledge assessment: Comparison of referent structures. *Journal of Educational Psychology* 86, 303-311. doi: 10.1037/0022-0663.86.2.303
- Albee, G. W. (1968). Conceptual models and manpower requirements in psychology. *American Psychologist* 23, 317-320. doi: 10.1037/h0026125
- Alpert, J. L. (1976). Conceptual bases of mental health consultation in the schools. *Professional Psychology*, 7, 619-626. doi: 10.1037/h0078612
- Altrocchi, J. (1972). Mental health consultation. In S. E. Golann & Eisdorfer (Eds.), *Handbook of community mental health* (pp. 477-508). New York: Appleton-Century-Crofts.
- Amazon. (2016). FAQ How do I prevent workers who have worked on my HIT (e.g., surveys) once from taking part in subsequent HITs? Retrieved from [https://requester.mturk.com/help/faq#how\\_prevent\\_repeated\\_hits](https://requester.mturk.com/help/faq#how_prevent_repeated_hits)
- American Psychological Association. (2005). Policy statement on evidence-based practice in psychology. Retrieved from <http://www.apa.org/practice/resources/evidence/evidence-based-statement.pdf>
- Anderson, M. C. (2003). Rethinking interference theory: Executive control and the mechanisms of forgetting. *Journal of Memory and Language*, 49, 415-445. doi: 10.1016/j.jml.2003.08.006
- Anderson, T. K., Kratochwill, T. R., & Bergan, J. R. (1986). Training teachers in behavioral consultation and therapy: An analysis of verbal behaviors. *Journal of School Psychology*, 24, 229-241. doi: 10.1016/0022-4405(86)90056-7

- Bereiter, C. (1992). Referent-centred and problem-centred knowledge: Elements of an educational epistemology. *Interchange*, 23, 337-361. doi: 10.1007/BF01447280
- Bergan, J. R. (1995). Evolution of a problem-solving model of consultation. *Journal of Educational and Psychological Consultation*, 6, 111-123. doi: 10.1207/s1532768xjepc0602\_2
- Bergan, J. R., & Caldwell, T. (1995). Operant techniques in school psychology. *Journal of Educational & Psychological Consultation*, 6, 103-110. doi: 10.1207/s1532768xjepc0602\_1 (Reprinted from Operant techniques in school psychology, (1967) *Psychology in the Schools*, 4, 136-141.)
- Bergan, J. R., & Kratochwill, T. R. (1990). *Behavioral consultation and therapy*. New York, NY: Plenum Press.
- Bergan, J. R., & Tombari M. L. (1975). The analysis of verbal interactions occurring during consultation. *Journal of School Psychology*, 12, 209-226. doi: 10.1016/0022-4405(75)90004-7
- Berinsky, A. J., Huber, G. A., & Lenz, G. S. (2012). Evaluating online labor markets for experimental research: Amazon. com's Mechanical Turk. *Political Analysis*, 20, 351–368. doi:10.1093/pan/mpr057
- Bertalanffy, L. (1969). *General systems theory: Foundations, development, applications*. New York: George Brazillier.
- Bohannon, J. (2011). Human subject research: Social science for pennies. *Science*, 334, 307-307. doi:10.1126/science.334.6054.307

- Bramlett, R. K., Murphy, J. J., Johnson, J., Wallingsford, L., & Hall, J. D. (2002). Contemporary practices in school psychology: A national survey of roles and referral problems. *Psychology in the Schools, 39*, 327-335. doi: 10.1002/pits.10022
- Brehm, J. W. (1966). *A theory of psychological reactance*. New York, NY: Academic Press.
- Briesch, A. M., Chafouleas, S. M., Neugebauer, S. R., & Riley-Tillman, T. C. (2013). Assessing influences on intervention implementation: Revision of the usage rating profile-intervention. *Journal of School Psychology, 51*, 81-96. doi: 10.1016/j.jsp.2012.08.006
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American psychologist, 32*, 513-531. doi: 10.1037/0003-066X.32.7.513
- Brown, D., Pryzwansky, W. B., & Schulte, A. C. (2011). *Psychological consultation and collaboration: Introduction to theory and practice* (7<sup>th</sup> ed.). Boston: Pearson.
- Brown, D., & Schulte, A. C. (1987). A social learning model of consultation. *Professional Psychology: Research and Practice, 18*, 283-287. doi: 10.1037/0735-7028.18.3.283
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science, 6*, 3-5. doi:10.1177/1745691610393980
- Burns, L. R., & D'Zurilla, T. J. (1999). Individual differences in perceived information-processing styles in stress and coping situations: Development and validation of the perceived modes of processing inventory. *Cognitive Therapy and Research, 23*, 345-371. doi: 10.1023/A:1018799700207
- Caplan, G. (1964). *Principles of preventive psychiatry*. New York: Basic Books.
- Caplan, G. (1970). *The theory and practice of mental health consultation*. New York: Basic Books.

- Caplan, G. (1974). *Support systems and community mental health*. New York: Behavioral Publications.
- Caplan, G. (1977). Mental health consultation: Retrospect and prospect. In S. C. Plog & P. I. Ahmed (Eds.), *Principles and techniques of mental health consultation* (pp. 9-21). New York: Plenum.
- Caplan, G., & Caplan, R. B. (1999). *Mental health consultation and collaboration*. Prospect Heights, IL: Waveland. (Original work published in 1993.)
- Caplan, G., Caplan, R. B., & Erchul, W. P. (1994). Caplanian mental health consultation: Historical background and current status. *Consulting psychology journal*, *46*, 2-12. doi: 10.1037/1061-4087.46.4.2
- Carlson, C. I., & Tombari, M. L. (1986). Multilevel school consultation training: Preliminary program evaluation. *Professional School Psychology*, *1*, 89-104. doi: 10.1037/h0090500
- Cleven, C. A. (1987). *Making the consultation process more overt: Its effects on consultee problem-solving skills*. (Doctoral dissertation), Retrieved from ETD collection for University of Nebraska - Lincoln. (AAI8704544).
- Cleven, C. A., & Gutkin, T. B. (1988). Cognitive modeling of consultation processes: A means for improving consultees' problem definition skills. *Journal of School Psychology*, *26*, 379-389. doi: 10.1016/0022-4405(88)90045-3
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests". *Psychometrika*, *16*, 297-334. doi:10.1007/bf02310555
- Curtis, M. J., & Watson, K. L. (1980). Changes in consultee problem clarification skills following consultation. *Journal of School Psychology*, *18*, 210-221. doi: 10.1016/0022-4405(80)90061-8



- Curtis, M. J., & Zins, J. E. (1988). Effects of training in consultation and instructor feedback on acquisition of consultation skills. *Journal of School Psychology, 26*, 185-190. doi: 10.1016/0022-4405(88)90019-2
- Davidson, J. E., & Sternberg, R. J. (Eds.). (2003). *The psychology of problem solving*. New York, NY: University Press.
- Derner, G. F. (1965). Comments on the emerging role in school psychology. *Psychology in the Schools, 2*, 350-351. doi: 10.1002/1520-6807(196510)2:4<350::AID-PITS2310020411>3.0.CO;2-Y
- Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology, 41*, 327-350. doi: 10.1007/s10464-008-9165-0
- D'Zurilla, T. J., & Chang, E. C. (1995). The relations between social problem solving and coping. *Cognitive Therapy and Research, 19*, 547-562. doi: 10.1007/BF02230513
- D'Zurilla, T. J., & Goldfried, M. R. (1971). Problem solving and behavior modification. *Journal of Abnormal Psychology, 78*, 107-126. doi: 10.1037/h0031360
- D'Zurilla, T. J., & Nezu, A. M. (1982). Social problem solving in adults. In P. C. Kendall (Ed.), *Advances in cognitive-behavioral research and therapy* (Vol. 1, pp. 201- 274). New York, NY: Academic Press.
- D'Zurilla, T. J., Nezu, A. M., & Maydeu-Olivares, A. (2002). *Social Problem-Solving Inventory-Revised (SPSI-R)*. North Tonawanda, NY: Multi-Health Systems.
- D'Zurilla, T. J., Nezu, A. M., & Maydeu-Olivares, A. (2004). Social problem solving: Theory and assessment. In E. C. Chang, T. J. D'Zurilla, & L. J. Sanna (Eds.), *Social problem*

- solving: Theory, research, and training* (pp. 11–27). Washington, DC: American Psychological Association.
- Elliott, S. N. (1988). Acceptability of behavioral treatments: Review of variables that influence treatment selection. *Professional Psychology: Research and Practice, 19*, 68-80. doi: 10.1037/0735-7028.19.1.68
- Erchul, W. P. (1987). A relational communication analysis of control in school consultation. *Professional School Psychology, 2*, 113-124. doi: 10.1037/h0090534
- Erchul, W. P., & Chewning, T. G. (1990). Behavioral consultation from a request-centered relational communication perspective. *School Psychology Quarterly, 5*, 1-20. doi: 10.1037/h0090598
- Erchul, W. P., Grissom, P. F., & Getty, K. C. (2008). Studying interpersonal influence within school consultation: Social power base and relational communication perspectives. In W. P. Erchul & S. M. Sheridan (Eds.), *Handbook of research in school consultation: Empirical foundations for the field* (pp. 293-322). Mahwah, NJ: Erlbaum.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G\*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175-191. doi: 10.3758/BF03193146
- Frey, A. J., Sabatino, C. A., & Alvarez, M. E. (2013). Consultation to improve treatment integrity. *Children & Schools, 35*, 3-8. doi: 10.1093/cs/cds037
- Fuchs, D., & Fuchs, L. S. (1989). Exploring effective and efficient prereferral interventions: A component analysis of behavioral consultation. *School Psychology Review, 18*, 260-283.

- Funke, J. (1991). Solving complex problems: Exploration and control of complex systems. In R. J. Sternberg & P. A. Frensch (Eds.), *Complex problem solving: Principles and mechanisms* (pp. 185-222). Hillsdale, NJ: Lawrence Erlbaum Associates.
- G\*Power [Computer software]. (2016). Retrieved from <http://gpower.hhu.de/>
- Gallessich, J. (1985). Toward a meta-theory of consultation. *The Counseling Psychologist, 13*, 336-354. doi: 10.1177/0011000085133002
- Gonzalez, J. E., Nelson, J. R., Gutkin, T. B., & Shwery, C. S. (2004). Teacher resistance to school-based consultation with school psychologists: A survey of teacher perceptions. *Journal of Emotional and Behavioral Disorders, 12*, 30-37. doi: 10.1177/10634266040120010401
- Gosling, S.D., Vazire, S., Srivastava, S., & John, O.P. (2004). Should we trust Web-based studies? A comparative analysis of six preconceptions about Internet questionnaires. *American Psychologist, 59*, 93–104. doi: 10.1037/0003-066X.59.2.93
- Gresham, F. M., & Kendell, G. K. (1987). School consultation research: Methodological critique and future research directions. *School Psychology Review, 16*, 306-316.
- Guli, L. A. (2005). Evidence-based parent consultation with school-related outcomes. *School Psychology Quarterly, 20*, 455-472. doi: 10.1521/scpq.2005.20.4.455
- Gutkin, T. B. (1981). Relative frequency of consultee lack of knowledge, skills, confidence, and objectivity in school settings. *Journal of School Psychology, 19*, 57-61. doi: 10.1016/0022-4405(81)90008-X
- Gutkin, T. B. (1993). Moving from behavioral to ecobehavioral consultation: What's in a name? *Journal of Educational and Psychological Consultation, 4*, 95-99. doi: 10.1207/s1532768xjepc0401\_6

- Gutkin, T. B. (2012). Ecological psychology: Replacing the medical model paradigm for school-based psychological and psychoeducational services. *Journal of Educational and Psychological Consultation, 22*, 1-20. doi: 10.1080/10474412.2011.649652
- Gutkin, T. B., & Curtis, M. J. (1999). School-based consultation theory and practice: The art and science of indirect service delivery. In C. R. Reynolds & T. B. Gutkin (Eds.). *The handbook of school psychology* (3<sup>rd</sup> ed., pp. 598-637). New York, NY: Wiley.
- Gutkin, T. B., & Curtis, M. J. (2008). School-based consultation: The science and practice of indirect service delivery. In T. B. Gutkin & C. R. Reynolds (Eds.), *The handbook of school psychology* (4<sup>th</sup> ed., pp. 591-635). Hoboken, NJ: John Wiley & Sons Inc.
- Gutkin, T. B., & Curtis, M. J. (2009). School-based consultation: The science and practice of indirect service delivery. In C. R. Reynolds & T. B. Gutkin (Eds.), *The handbook of school psychology* (4<sup>th</sup> ed., pp. 591-635). Hoboken, NJ: Wiley.
- Heitjan, D. J., Basu, S. (1996). Distinguishing “Missing at random” and “Missing Completely at Random”. *The American Statistician, 50*, 207-213. doi: 10.1080/00031305.1996.10474381
- Heppner, P. P. (1978). A review of the problem-solving literature and its relationship to the counseling process. *Journal of Counseling Psychology, 25*, 366-376. doi: 10.1037/0022-0167.25.5.366
- Holcomb, P. J., & Neville, H. J. (1990). Auditory and visual semantic priming in lexical decision: A comparison using event-related brain potentials. (1990). *Language and Cognitive Processes, 5*, 281-312. doi: 10.1080/01690969008407065
- Jacobson, N., Butterill, D., & Goering, P. (2005). Consulting as a strategy for knowledge transfer. *The Milbank Quarterly, 83*, 299-321. doi: 10.2307/30045616

- Kratochwill, T. R., Bergan, J. R., Sheridan, S. M., & Elliott, S. N. (1998). Assumptions of behavioral consultation: After all is said and done more has been done than said. *School Psychology Quarterly, 13*, 63-80. doi: 10.1037/h0088972
- Kratochwill, T. R., Elliott, S. N., & Busse, R. T. (1995). Behavior consultation: A five-year evaluation of consultant and client outcomes. *School Psychology Quarterly, 10*, 87-117. doi: 10.1037/h0088299
- Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M & Shadish, W. R. (2010). Single-case designs technical documentation. Retrieved from What Works Clearinghouse website: [http://ies.ed.gov/ncee/wwc/pdf/wwc\\_scd.pdf](http://ies.ed.gov/ncee/wwc/pdf/wwc_scd.pdf).
- Kratochwill, T. R., VanSomeren, K. R., & Sheridan, S. M. (1989). Training behavioral consultants: A competency-based model to teach interview skills. *Professional School Psychology, 4*, 41-58. doi: 10.1037/h0090570
- Lee, S. W., Allen, J. P., & Skorupski, W. P. (2012, May). Transfer in applied problem solving. Poster presented at the Annual Meeting of the Association for Psychological Science, Chicago, IL.
- Lee, S. W., & Niileksela, C. R. (2014). *Ecobehavioral consultation in schools: Theory and practice for school psychologists, special educators, and school counselors*. New York: Routledge.
- Lee, S. W., Niileksela, C. R., & Allen, J. (2014). The ecobehavioral consultation process In S.W. Lee & C.R. Niileksela (Eds.), *Ecobehavioral consultation in schools: Theory and practice for school psychologists, special educators, and school counselors* (pp. 22-96). New York, NY: Routledge.

- Lepage, K., Kratochwill, T. R., & Elliott, S. N. (2004). Competency-based behavior consultation training: An evaluation of consultant outcomes, treatment effects, and consumer satisfaction. *School Psychology Quarterly, 19*, 1-28. doi: 10.1521/scpq.19.1.1.29406
- Leton, D. A. (1964). School Psychology: Its purposes and directions. *Psychology in the Schools, 1*, 187-190.
- Lewis, T. J., & Newcomer, L. L. (2002). Examining the efficacy of school-based consultation: Recommendations for improving outcomes. *Child & Family Behavior Therapy, 24*, 165-181. doi: 10.1300/J019v24n01\_11
- Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology, 22*, 55.
- Litman, L., Robinson, J., & Rosenzweig, C. (2015). The relationship between motivation, monetary compensation, and data quality among US- and India-based workers on Mechanical Turk. *Behavior Research Methods, 47*, 519-528. doi:10.3758/s13428-014-0483-x
- Lupker, S. J. (1984). Semantic priming without association: A second look. *Journal of verbal learning and verbal behavior, 23*, 709-733. doi:10.1016/S0022-5371(84)90434-1
- Macklem, G. L., & Kalinsky, R. (2000). *School consultation: Providing both prevention and intervention services to children and school staff*. Paper presented at the National Association of School Psychologists, New Orleans, Louisiana. *ERIC Reproduction Service No. ED 444 103*. Retrieved from <http://files.eric.ed.gov/fulltext/ED444103.pdf>
- Mannino, F. V., & Shore, M. F. (1975). The effects of consultation: A review of empirical studies. *American Journal of Community Psychology, 3*, 1-21. doi: 10.1007/BF01101416

- McDaniel, L. J., & Ahr, E. (1965). The school psychologist as a resource person initiating and conducting in-service teacher education. *Psychology in the Schools, 2*, 220-224. doi: 10.1002/1520-6807(196507)2:3<220::AID-PITS2310020307>3.0.CO;2-9
- McDougall, L. M., Reschly, D. J., & Corkery, J. M. (1988). Changes in referral interviews with teachers after behavioral consultation training. *Journal of School Psychology, 26*, 225-232. doi: 10.1016/0022-4405(88)90002-7
- Medway, F. J. (1979). How effective is school consultation? A review of recent research. *Journal of School Psychology, 17*, 275-282. doi: 10.1016/0022-4405(79)90011-6
- Medway, F. J. (1982). School consultation research: Past trends and future directions. *Professional Psychology, 13*, 422-430. doi: 10.1037/0735-7028.13.3.422
- Medway, F. J. & Forman, S. G. (1980). Psychologists' and teachers' reaction to mental health and behavioral school consultation. *Journal of School Psychology, 18*, 338-348. doi: 10.1016/0022-4405(80)90005-9
- Medway, F. J. & Updyke, J. F. (1985). Meta-analysis of consultation outcome studies. *American Journal of Community Psychology, 13*, 489-505. doi: 10.1007/BF00923263
- Meyers, J. (1981). Mental health consultation. In J. C. Conoley (Ed.), *Consultation in schools* (pp. 35-58). New York: Academic Press.
- National Association of School Psychologists. (2010a). Model for comprehensive and integrated school psychological services. Retrieved from [http://www.nasponline.org/standards/2010standards/2\\_PracticeModel.pdf](http://www.nasponline.org/standards/2010standards/2_PracticeModel.pdf)
- National Association of School Psychologists. (2010b). NASP practice model: Improving outcomes for students and schools. Retrieved from [http://www.nasponline.org/standards/2010standards/2\\_PracticeModel.pdf](http://www.nasponline.org/standards/2010standards/2_PracticeModel.pdf)

- Naveh-Benjamin, M., McKeachie, W. J., Lin, Y.-G., & Tucker, D. G. (1986). Inferring students' cognitive structures and their development using the "Ordered Tree Technique." *Journal of Educational Psychology, 78*, 130-140. doi: 10.1037/0022-0663.78.2.130
- Naveh-Benjamin, M., McKeachie, W. J., & Lin, Y.-G. (1989). Use of the ordered-tree technique to assess students' initial knowledge and conceptual learning. *Teaching of Psychology, 16*, 182-187. doi: 10.1207/s15328023top1604\_3
- Nezu, A. M., Nezu, C. M., Friedman, S. H., Faddis, S., & Houts, P. S. (1998). *Helping cancer patients cope: A problem-solving approach*. Washington, DC: American Psychological Association.
- Noell, G. H., & Witt, J. C. (1996). A critical re-evaluation of five fundamental assumptions underlying behavioral consultation. *School Psychology Quarterly, 11*, 189-203. doi: 10.1037/h0088929
- O'Dell, S. L., Tarler-Benlolo, L., & Flynn, J. M. (1979). An instrument to measure knowledge of behavioral principals as applied to children. *Journal of Behavior Therapy and Experimental Psychiatry, 10*, 29-34. doi: 10.1016/0005-7916(79)90033-8
- Peck, C. A., Killen, C. C., & Baumgart, D. (1989). Increasing implementation of special education instruction in mainstream preschools: Direct and generalized effects of nondirective consultation. *Journal of Applied Behavior Analysis, 22*, 197-210. doi: 10.1901/jaba.1989.22-197
- Pretz, J. E., Naples, A. J., & Sternberg, R. J. (2003). Recognizing, defining, and representing problems. In J. E. Davidson & R. J. Sternberg (Eds.), *The psychology of problem solving* (pp. 3-30). New York, NY: Cambridge University Press.



- Pryzwansky, W. B. (1974). A reconsideration of the consultation model for delivery of school-based psychological services. *American Journal of Orthopsychiatry*, *44*, 579-583. doi: 10.1111/j.1939-0025.1974.tb00912.x
- Qualtrics. (n.d.). Retrieved from <https://www.qualtrics.com>
- Reddy, L. A., Barboza-Whitehead, S., & Files, T. (2000). Clinical focus of consultation outcome research with children and adolescents. *Special Services in the Schools*, *16*, 1-22. doi: 10.1300/J008v16n01\_01
- Reitman, J. S., & Rueter, H. H. (1980). Organization revealed by recall orders and confirmed by pauses. *Cognitive Psychology*, *12*, 554-581. doi: 10.1016/0010-0285(80)90020-1
- Revels, O. H., & Gutkin, T. B. (1983). Effects of symbolic modeling procedures and model status on brainstorming behaviors. *Journal of School Psychology*, *21*, 311-318. doi: 10.1016/0022-4405(83)90044-4
- Robbins, J. R., & Gutkin, T. B. (1994). Consultee and client remedial and preventive outcomes following consultation: Some mixed empirical results and directions for future researchers. *Journal of Educational and Psychological Consultation*, *5*, 149-167. doi: 10.1207/s1532768xjepc0502\_5
- Rotter, J. B. (1966). Generalized expectations for internal versus external control of reinforcement. *Psychological Monographs*, *80*, 1-28. doi: 10.1037/h0092976
- Rubin, D. B. (1976). Inference and missing data. *Biometrika*, *63*, 581-592. doi: 10.1093/biomet/63.3.581
- Ruiz-Primo, M. A., & Shavelson, R. J. (1996). Problems and issues in the use of concept maps in science assessment. *Journal of Research in Science Teaching*, *33*, 569-600. doi: 10.1002/(SICI)1098-2736(199608)33:6<569::AID-TEA1>3.0.CO;2-M

- Schein, E. H. (1988). *Process consultation: Its role in organizational development*. (Vol. 1, 2<sup>nd</sup> ed.). Reading, MA: Addison Wesley.
- Schmidt, K. M., & Pena, F. (1964). The psychologist as a consultant in the schools. *Psychology in the Schools, 1*, 419-425. doi: 10.1016/0022-4405(73)90003-4
- Schutz, P. A., Drogosz, L. M., White, V. E., & Distefano, C. (1998). Prior knowledge, attitude, and strategy use in an introduction to statistics course. *Learning and Individual Differences, 10*, 291-308. doi: 10.1016/S1041-6080(99)80124-1
- Schwartz, S. & Carpenter, K. M. (1999). The right answer for the wrong question: Consequences of the type III error for public health research. *American Journal of Public Health, 89*, 1175-1180.
- Shavelson, R. J. (1974). Methods for examining representations of a subject-matter structure in a student's memory. *Journal of Research in Science Teaching, 11*, 231-249. doi: 10.1002/tea.3660110307
- Sheridan, S. M., Clark, B. L., & Burt, J. D. (2008). *Conjoint behavioral consultation: What do we know and what do we need to know?* In Erchul, W. P., & Sheridan, S. M. (Eds.), *Handbook of research in school consultation* (pp. 171-202). New York, NY: Lawrence Erlbaum Associates.
- Sheridan, S. M., Eagle, J. W., Cowan, R. J., & Mickelson, W. (2001). The effects of conjoint behavioral consultation: Results of a 4-year investigation. *Journal of School Psychology, 39*, 361-385. doi: 10.1016/S0022-4405(01)00079-6
- Sheridan, S. M., Eagle, J. W., & Doll, B. (2006). An examination of the efficacy of conjoint behavioral consultation with diverse clients. *School Psychology Quarterly, 21*, 396-417. doi: 10.1037/h0084130

- Sheridan, S. M., Kratochwill, T. R., & Bergan, J. R. (1996). *Conjoint behavioral consultation*. New York, NY: Plenum.
- Sheridan, S. M., Welch, M., & Orme, S. F. (1996). Is consultation effective? A review of outcome research. *Remedial and Special Education, 17*, 341-354. doi: 10.1207/s1532768xjepc0104\_9
- Sugai, G., & Tindal, G. (1993). *Effective school consultation: An interactive approach*. Pacific Grove, CA: Brooks/Cole Publishing Company.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5<sup>th</sup> ed.). Boston, MA: Pearson Education Inc.
- Tharp, R. G., & Wetzel, R. J. (1970). *Behavior modification in the natural environment*. New York, NY: Academic Press.
- Truscott, S. D., Kreskey, D., Bolling, M., Psimas, L., Graybill, E., Albritton, K., & Schwartz, A. (2012). Creating consultee change: A theory-based approach to learning and behavioral change processes in school-based consultation. *Consulting Psychology Journal: Practice and Research, 64*, 63-82.
- Tulving, E., Schacter, D. L. (1990). Priming and human memory systems. *Science, 247*, 301-306.
- Watson, T. S., & Kramer, J. J. (1995). Teaching problem solving skills to teachers-in-training: An analogue experimental analysis of three methods. *Journal of Behavioral Education, 5*, 281-293. doi: 10.1007/BF02110316
- Winitzky, N., Kauchak, D., & Kelly, M. (1994). Measuring teachers' structural knowledge. *Teaching and teacher education, 10*, 125-139. doi: 10.1016/0742-051X(94)90008-6

Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis, 11* 203-214.

doi: 10.1901/jaba.1978.11-203

Zins, J. E., & Erchul, W. P. (2002). Best practices in school consultation. In A. Thomas & J. Grimes (Eds.). *Best practices in school psychology IV* (pp. 625-643). Bethesda, MD: The National Association of School Psychologists.

Zins, J. E. & Kratochwill, T. R. & Elliott, S. N. (1993). *Handbook of consultation services for children: Applications in educational settings*. San Francisco, CA: Jossey-Bass.

Zins, J. E., & Ponti, C. R. (1996). The influence of direct training in problem solving on consultee problem clarification skills and attributions. *Remedial and Special Education, 17*, 370-376. doi: 10.1177/074193259601700608

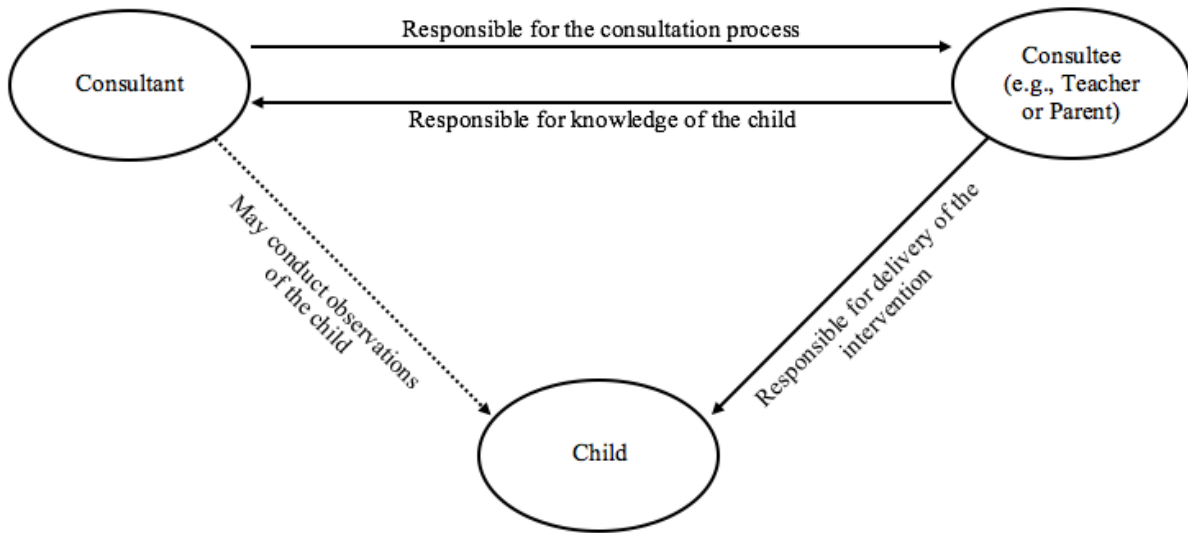


Figure 1. Tripartite model of the consultation process.

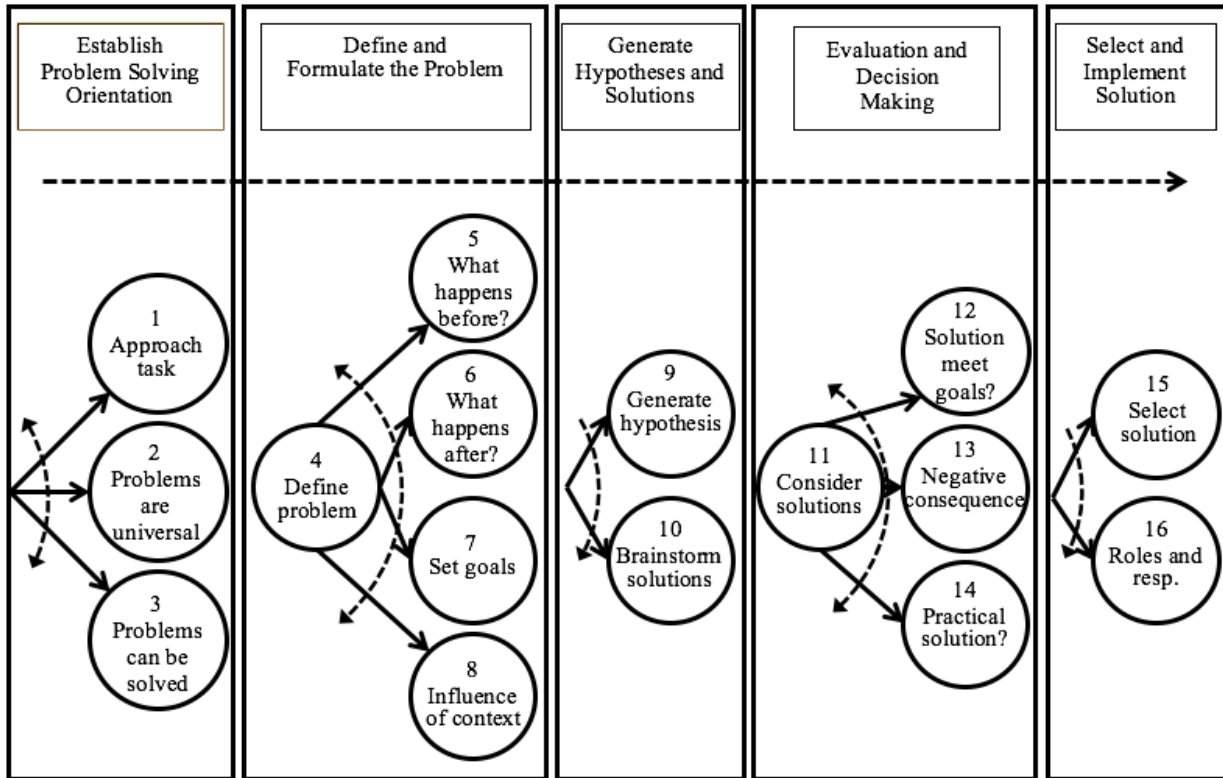


Figure 2. Directional organization of the problem-solving model.

$$P_{ij} = 1 - \frac{|X_{ij} - I_j| + c_j}{N}$$

*Figure 3.* Ideal point proximity formula.

$$IPPM_i = \mathring{a}_{j=1}^N P_{ij}$$

*Figure 4.* Ideal point proximity measure for examinee i.



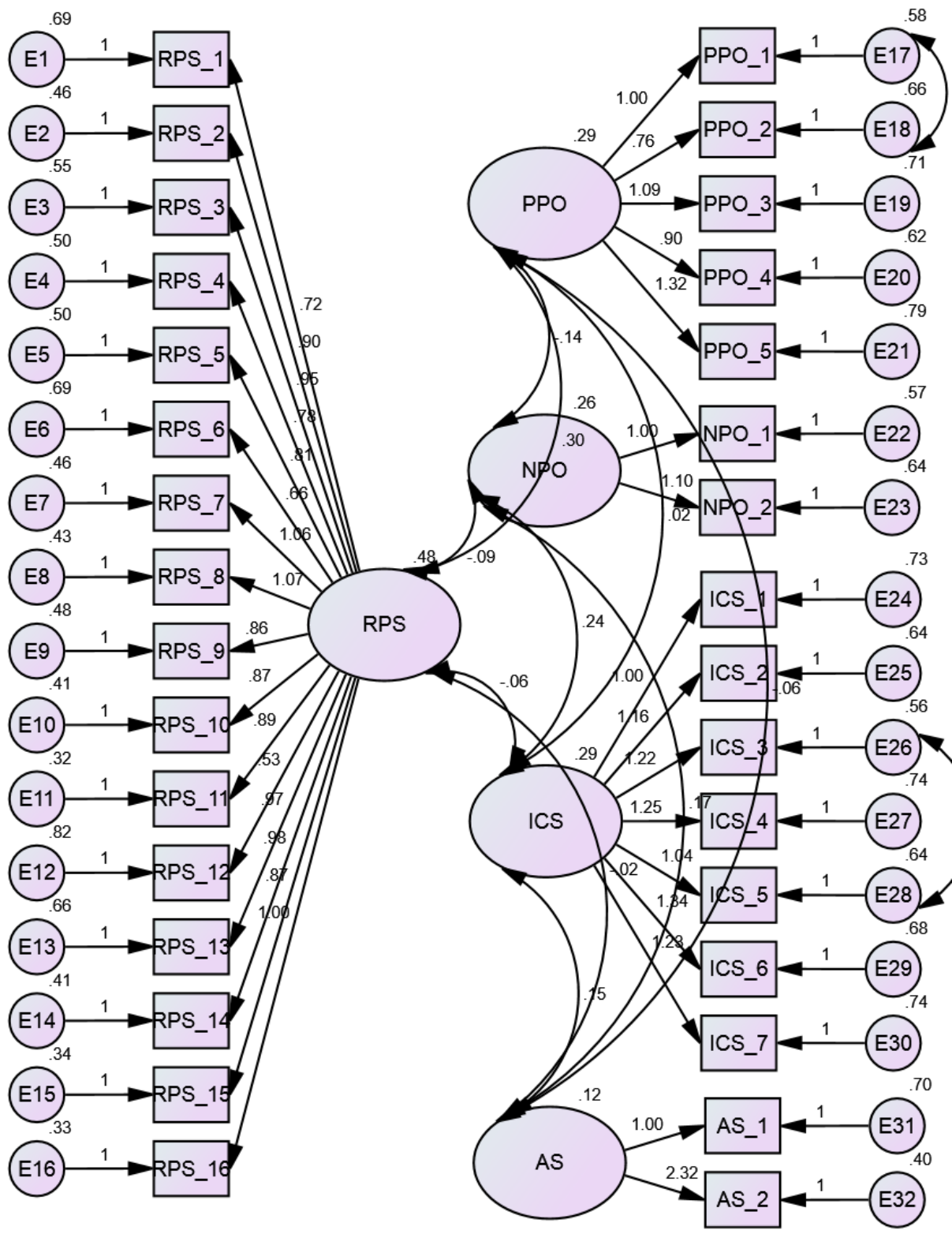


Figure 5. CFA model of the modified SPSI-R scale.

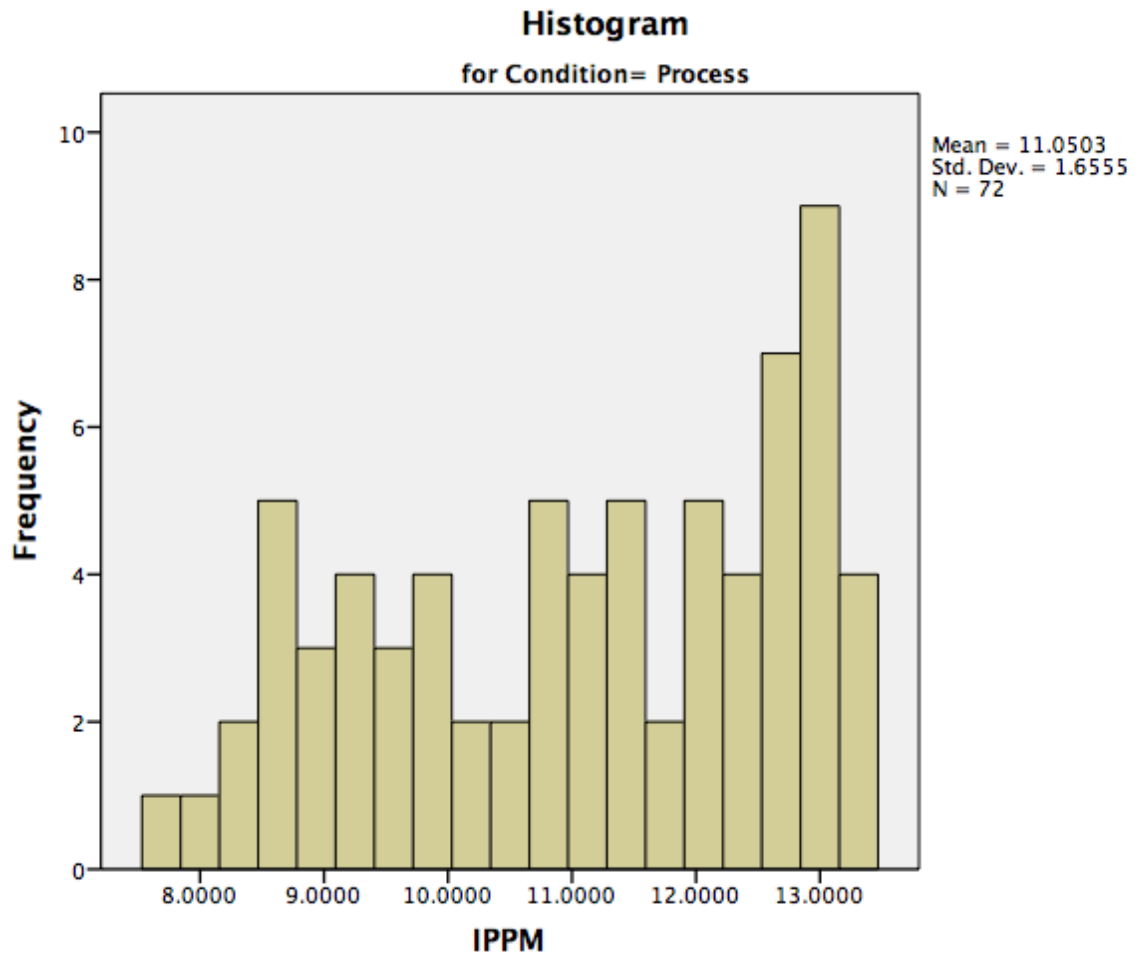


Figure 6. Histogram of uncorrected IPPM scores for the process condition.

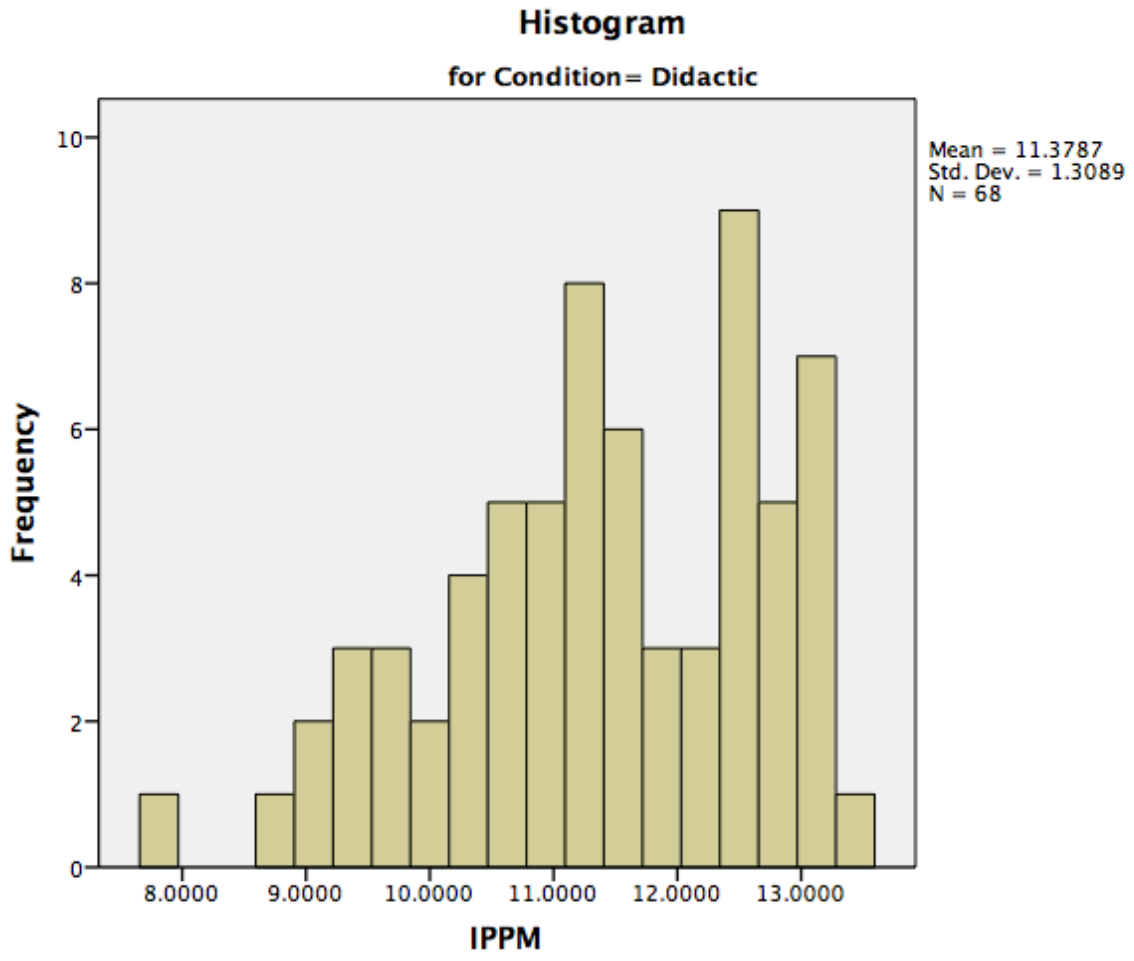


Figure 7. Histogram of uncorrected IPPM scores for the didactic condition.

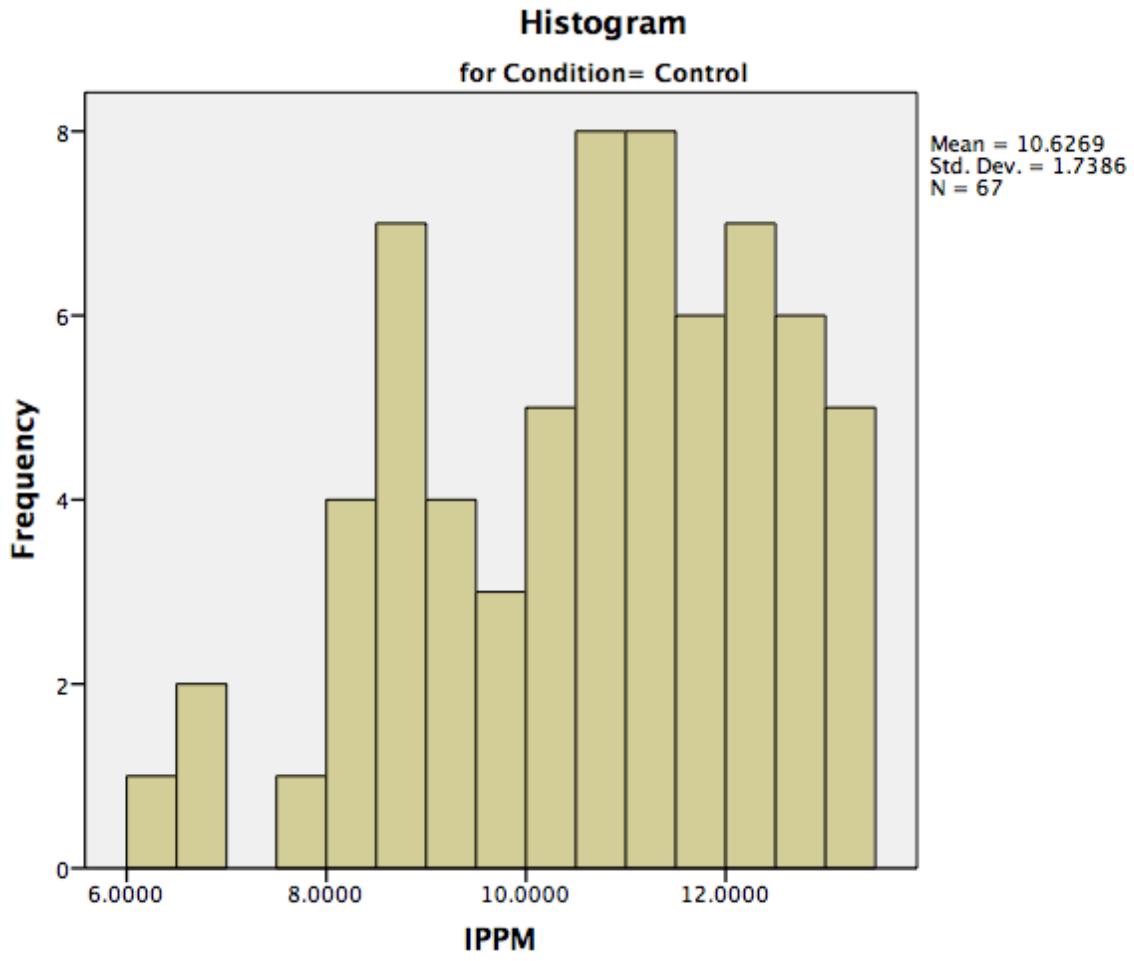


Figure 8. Histogram of uncorrected IPPM scores for the control condition.

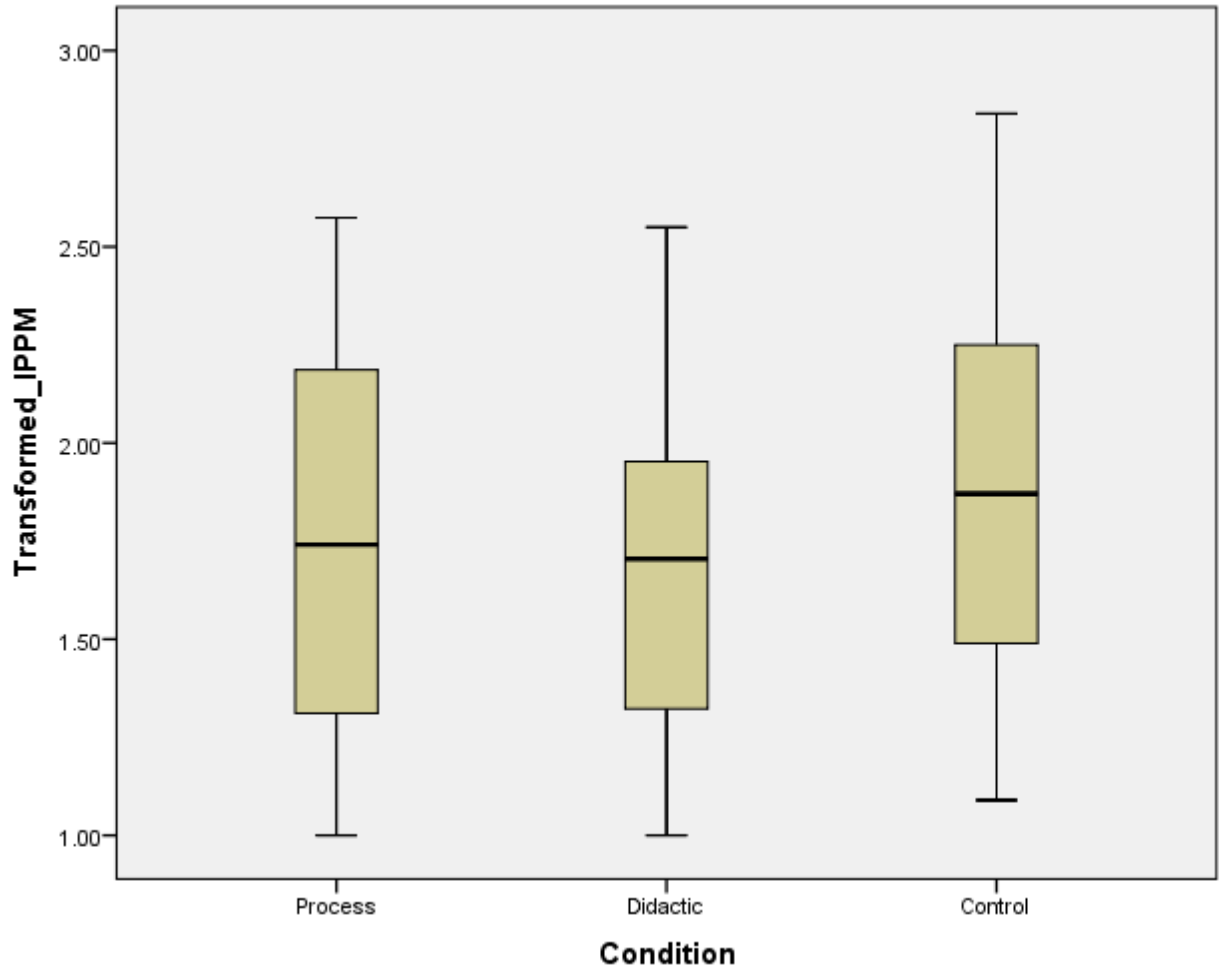


Figure 9. Boxplots of transformed IPPM scores by condition.

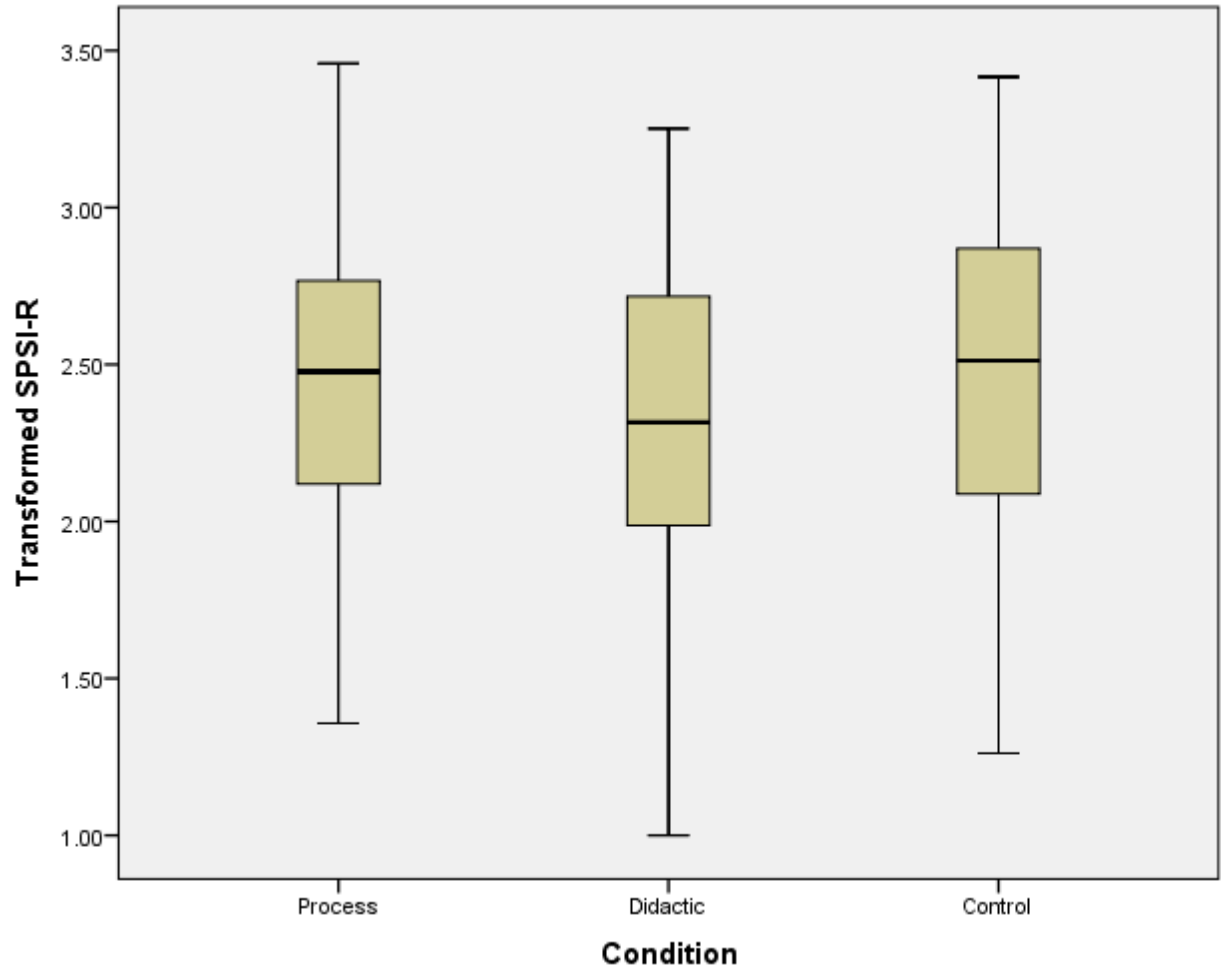


Figure 10. Boxplot of transformed SPSSI-R scores by condition.

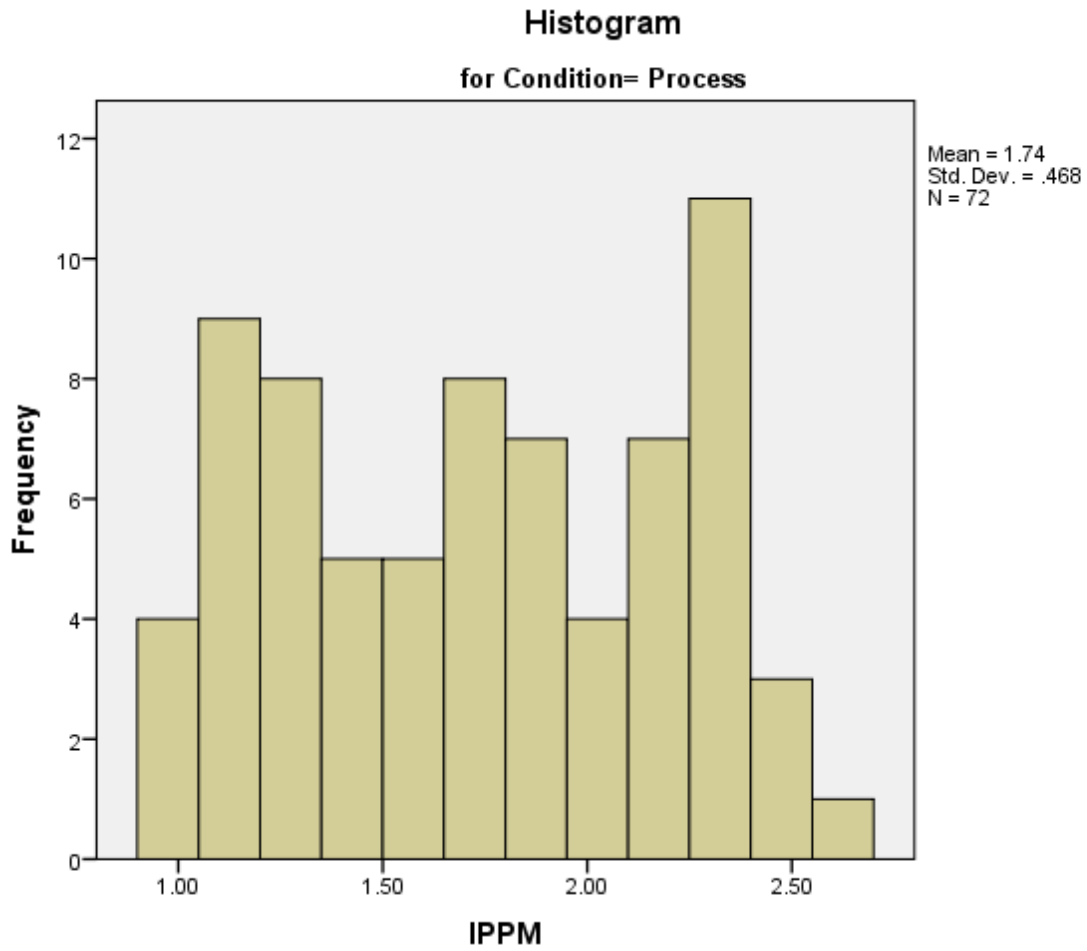


Figure 11. Histogram for transformed IPPM scores by process condition.

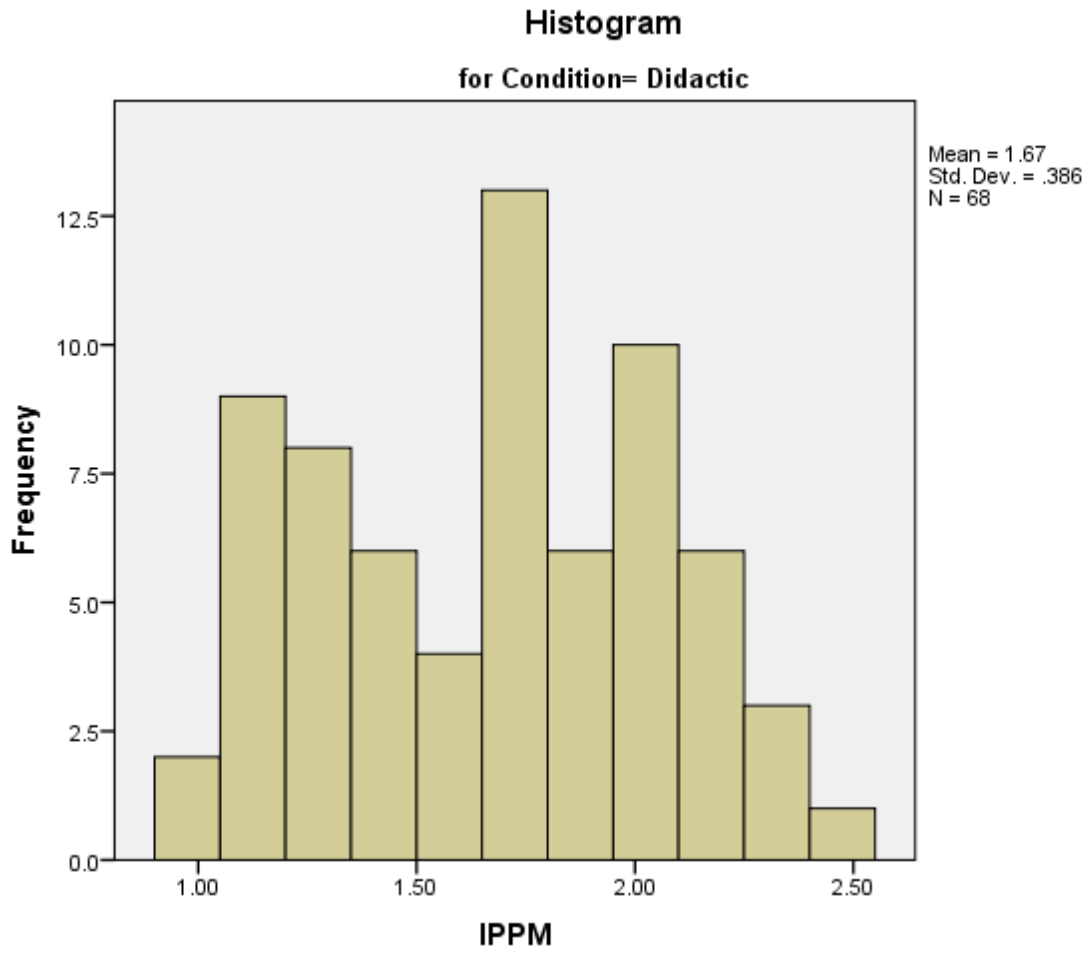


Figure 12. Histogram for transformed IPPM scores by didactic condition.



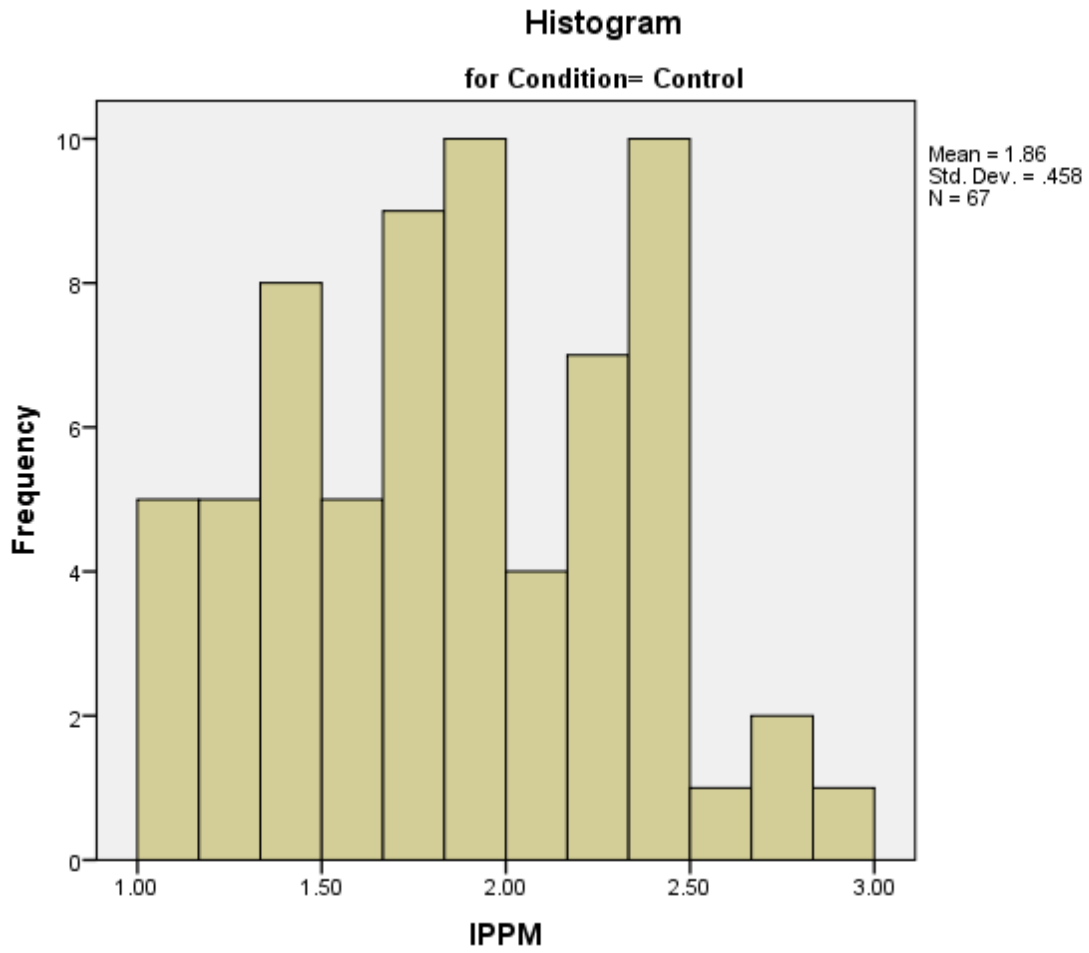


Figure 13. Histogram for transformed IPPM scores by control condition.

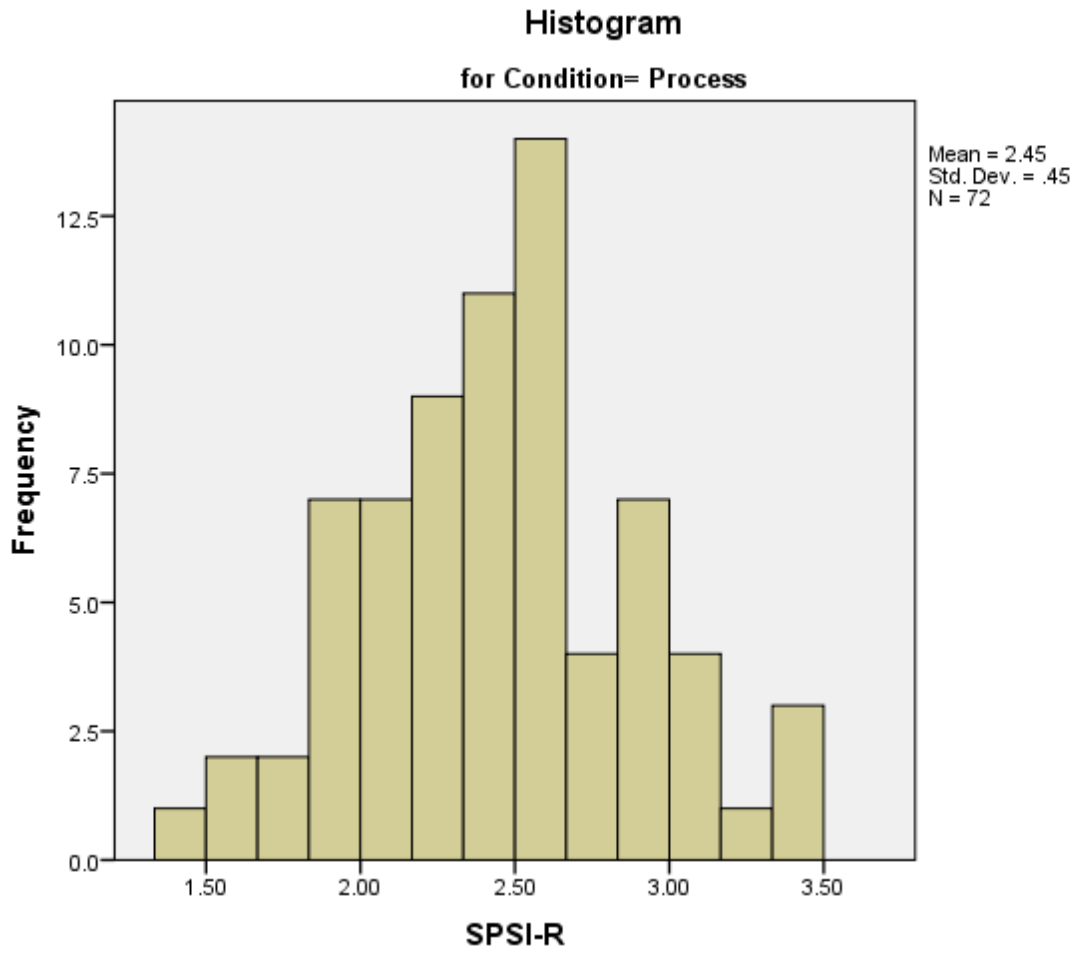


Figure 14. Histogram for transformed SPSI-R scores by process condition.

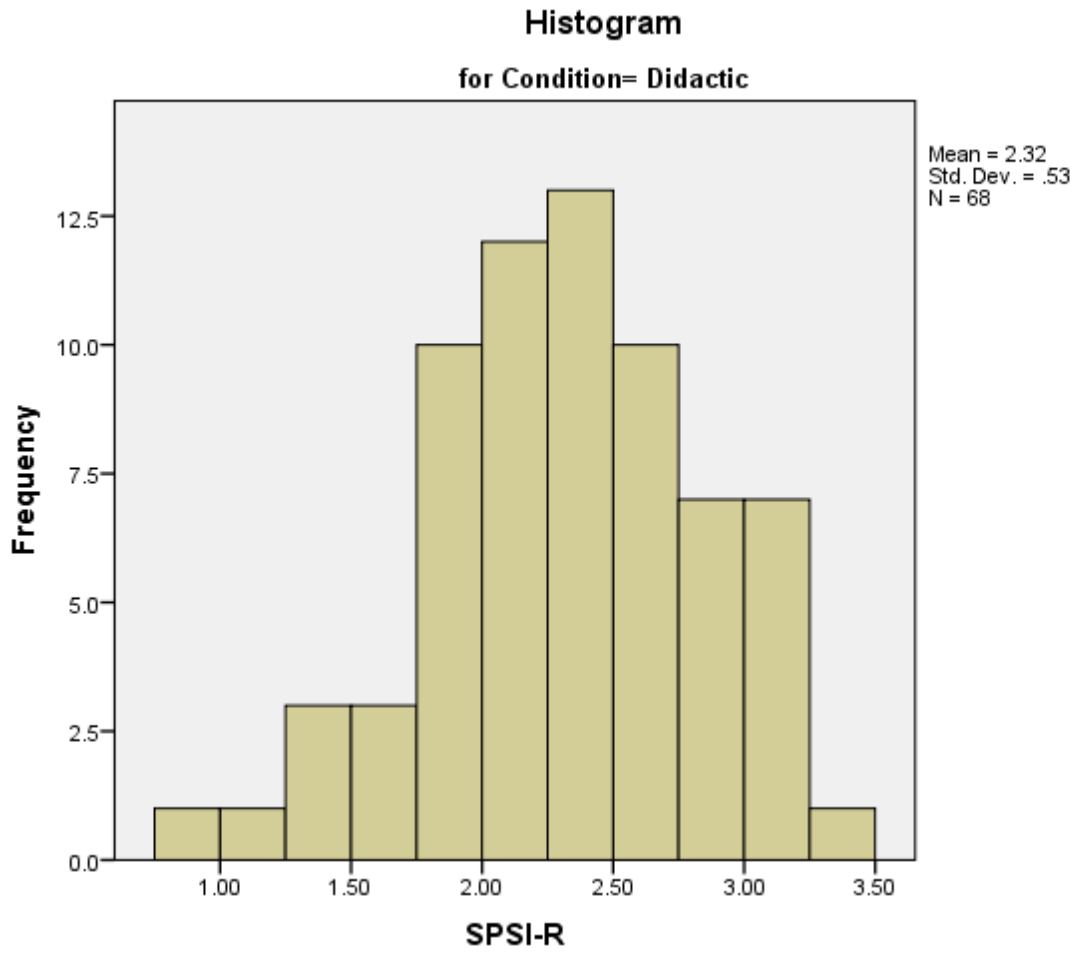


Figure 15. Histogram for transformed SPSI-R scores by didactic condition.

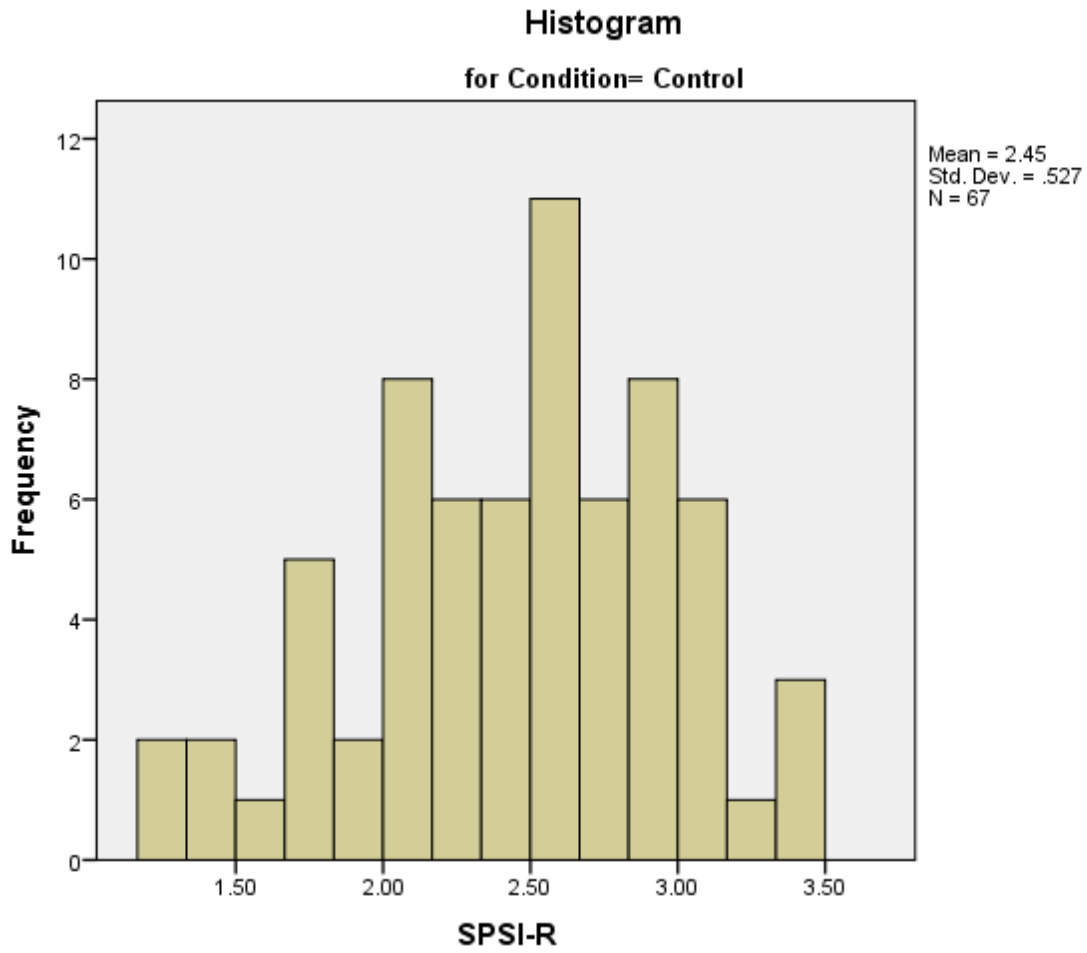


Figure 16. Histogram for transformed SPSI-R scores by control condition.

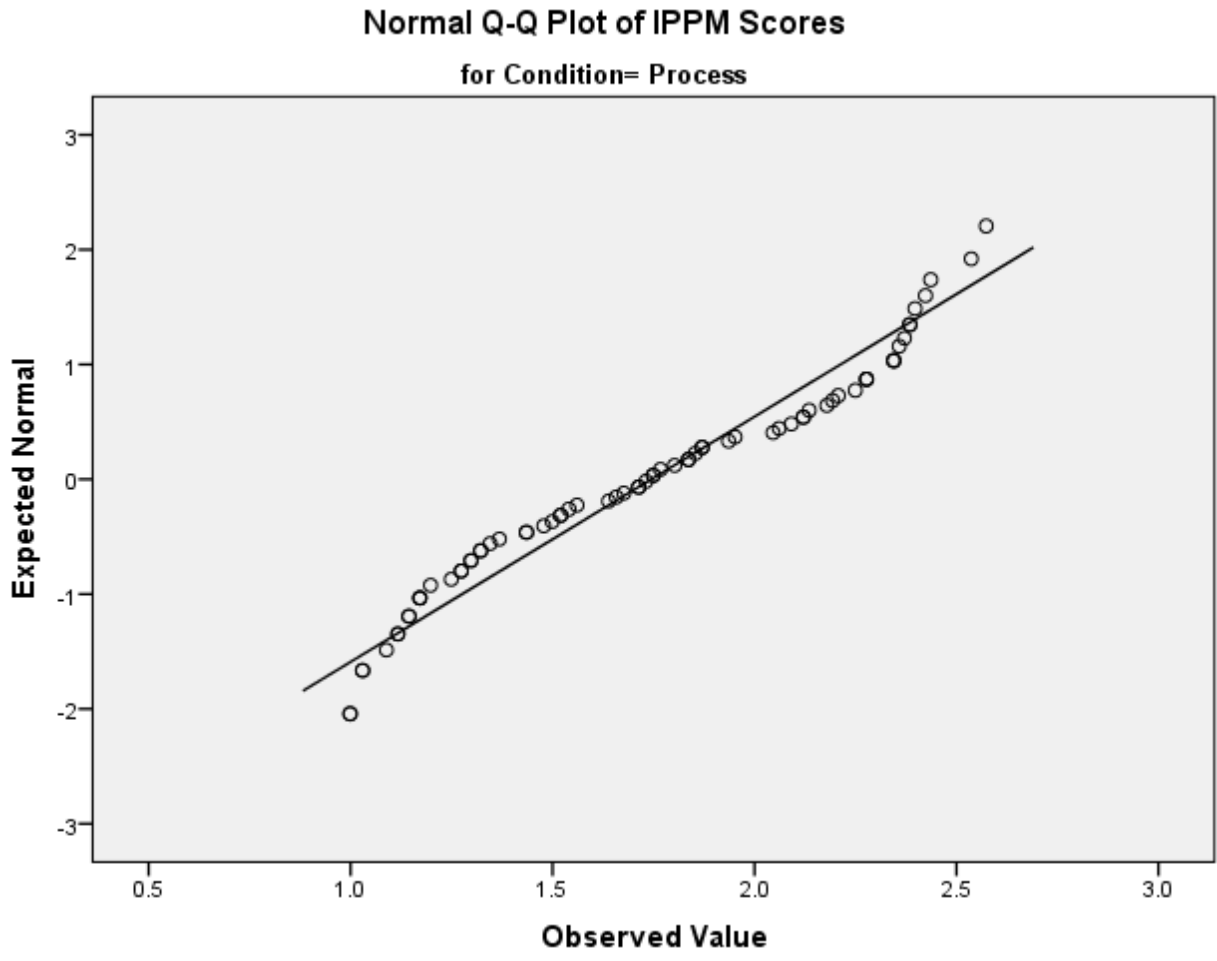


Figure 17. Normal Q-Q plot for transformed IPPM scores by process condition.

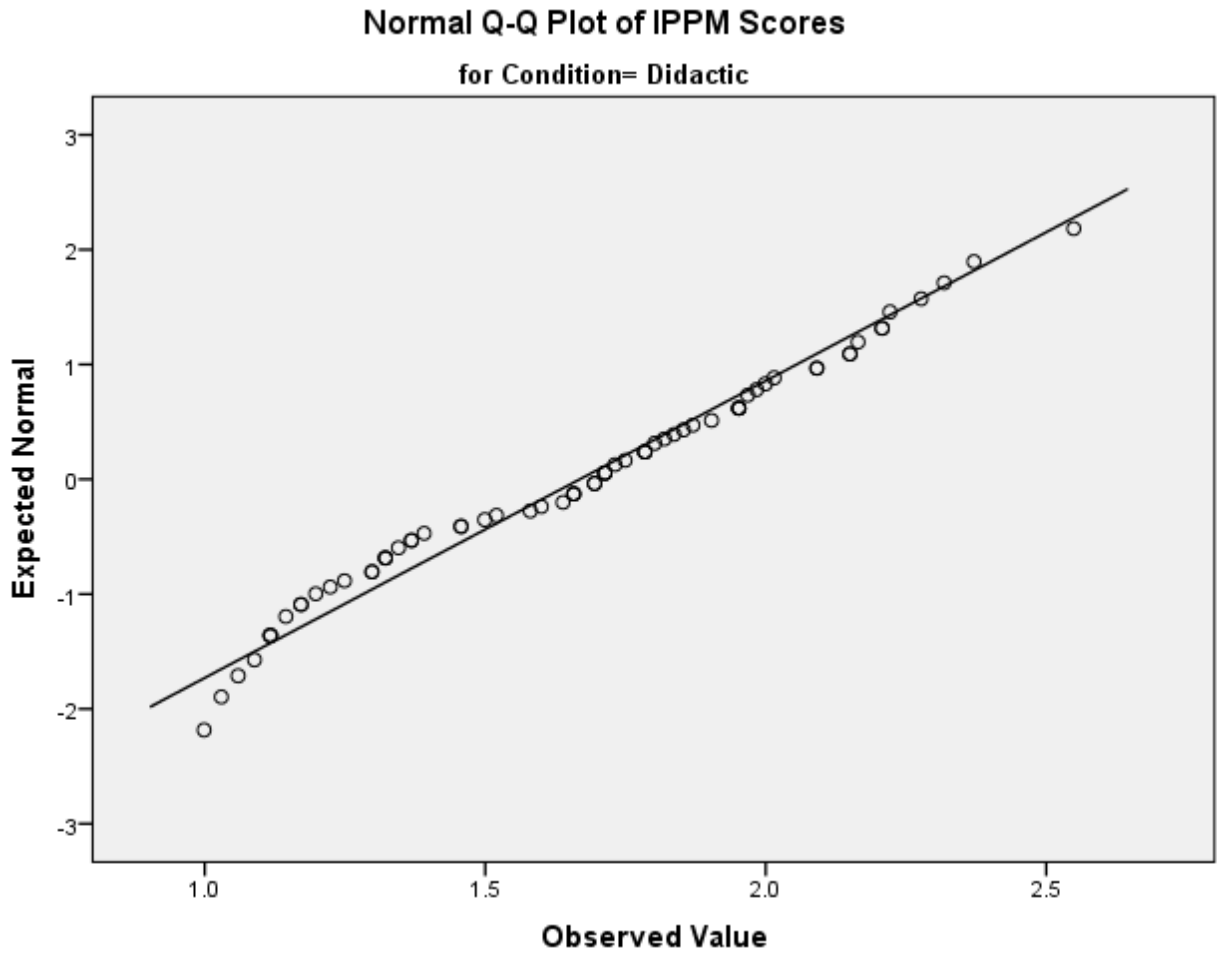


Figure 18. Normal Q-Q plot for transformed IPPM scores by didactic condition.

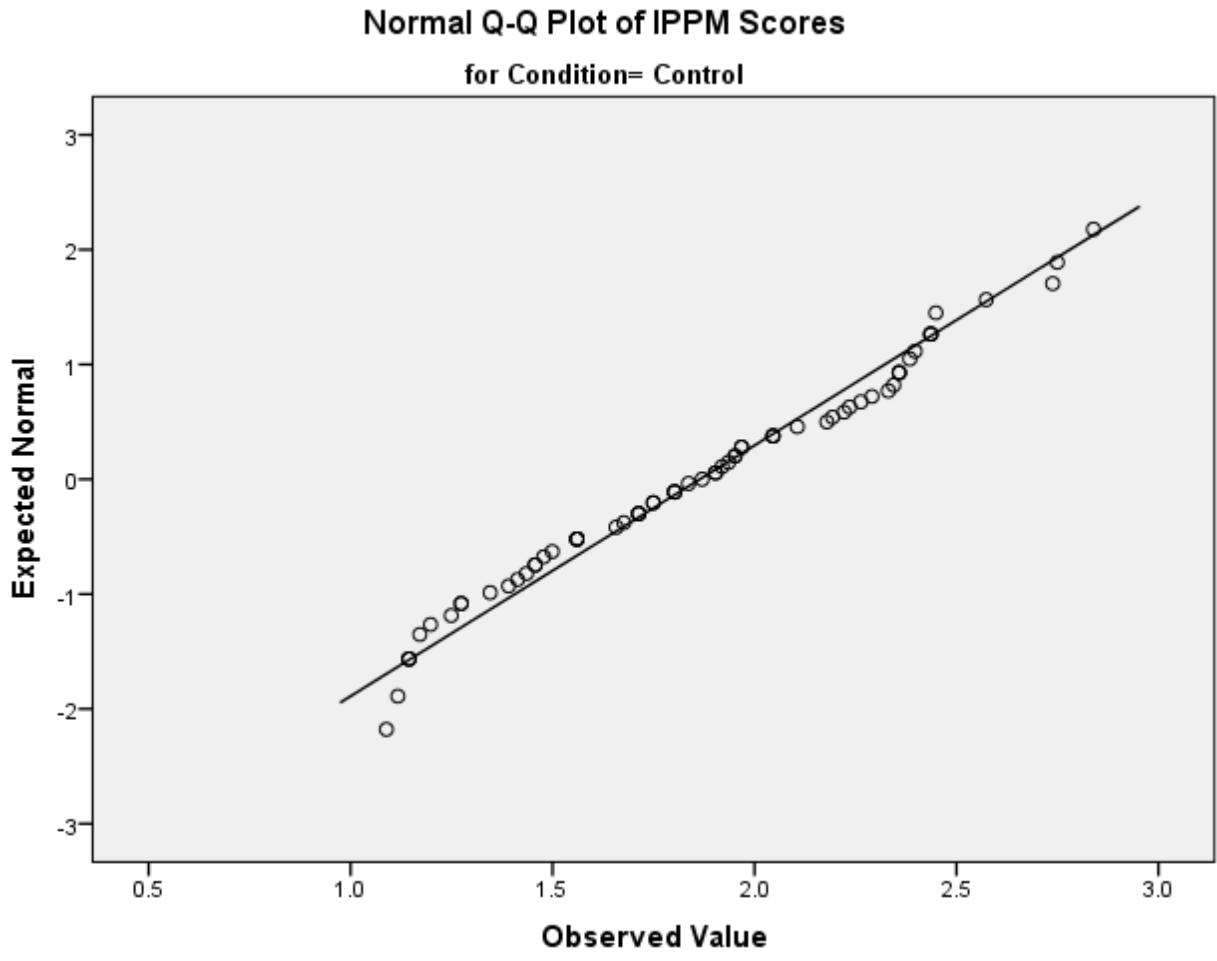


Figure 19. Normal Q-Q plot for transformed IPPM scores by control condition.

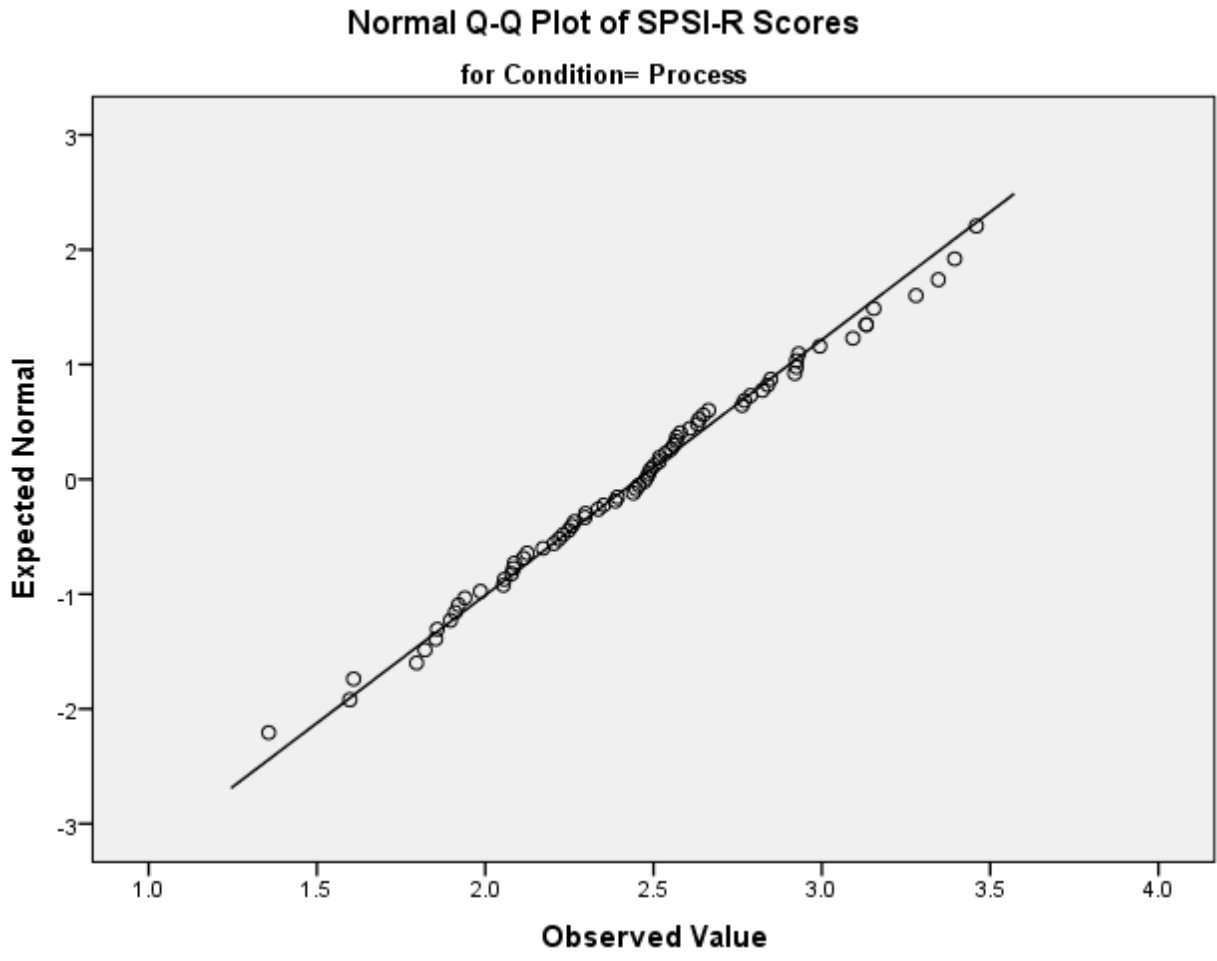


Figure 20. Normal Q-Q plot for transformed SPSI-R scores by process condition.



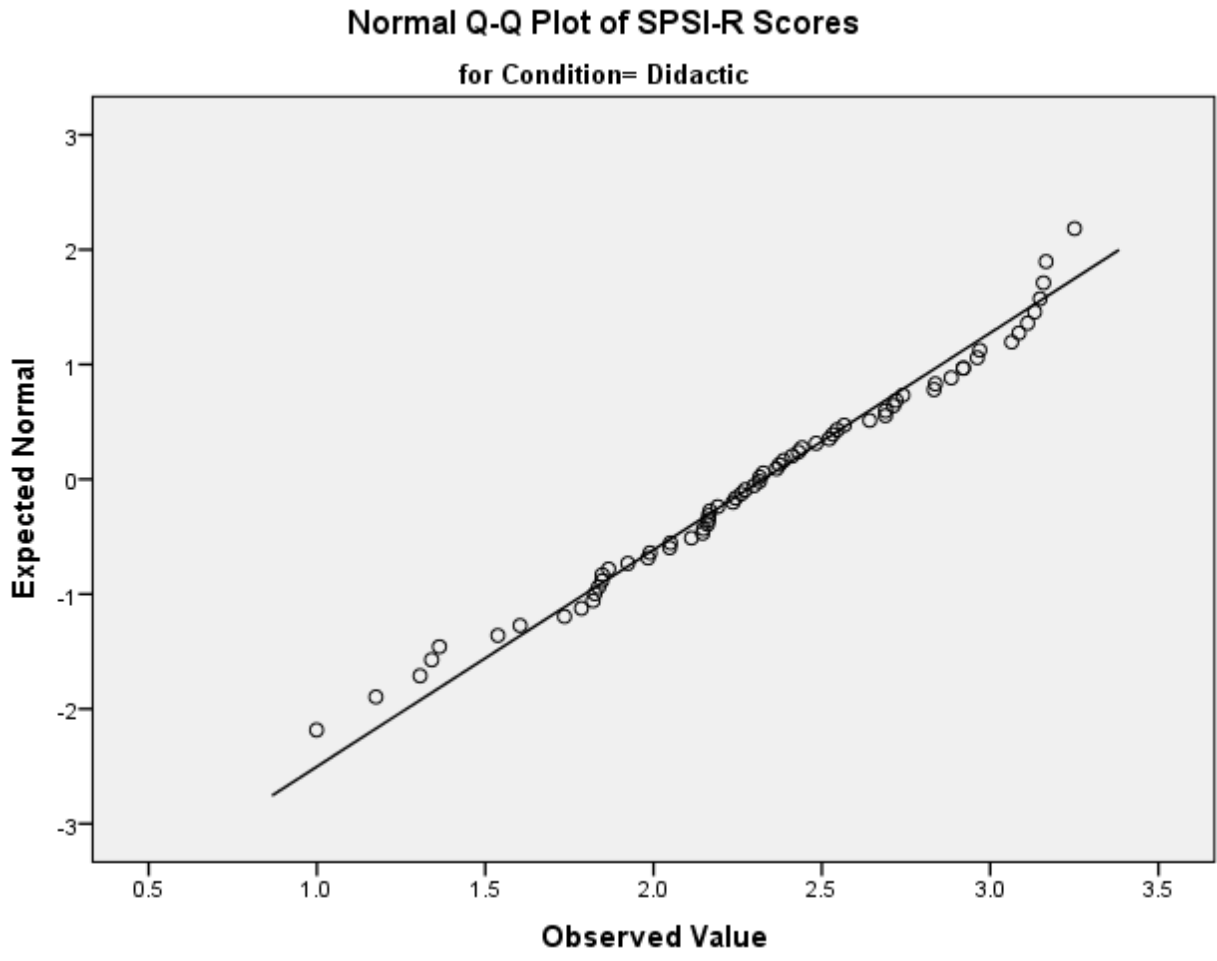


Figure 21. Normal Q-Q plot for transformed SPSI-R scores by didactic condition.

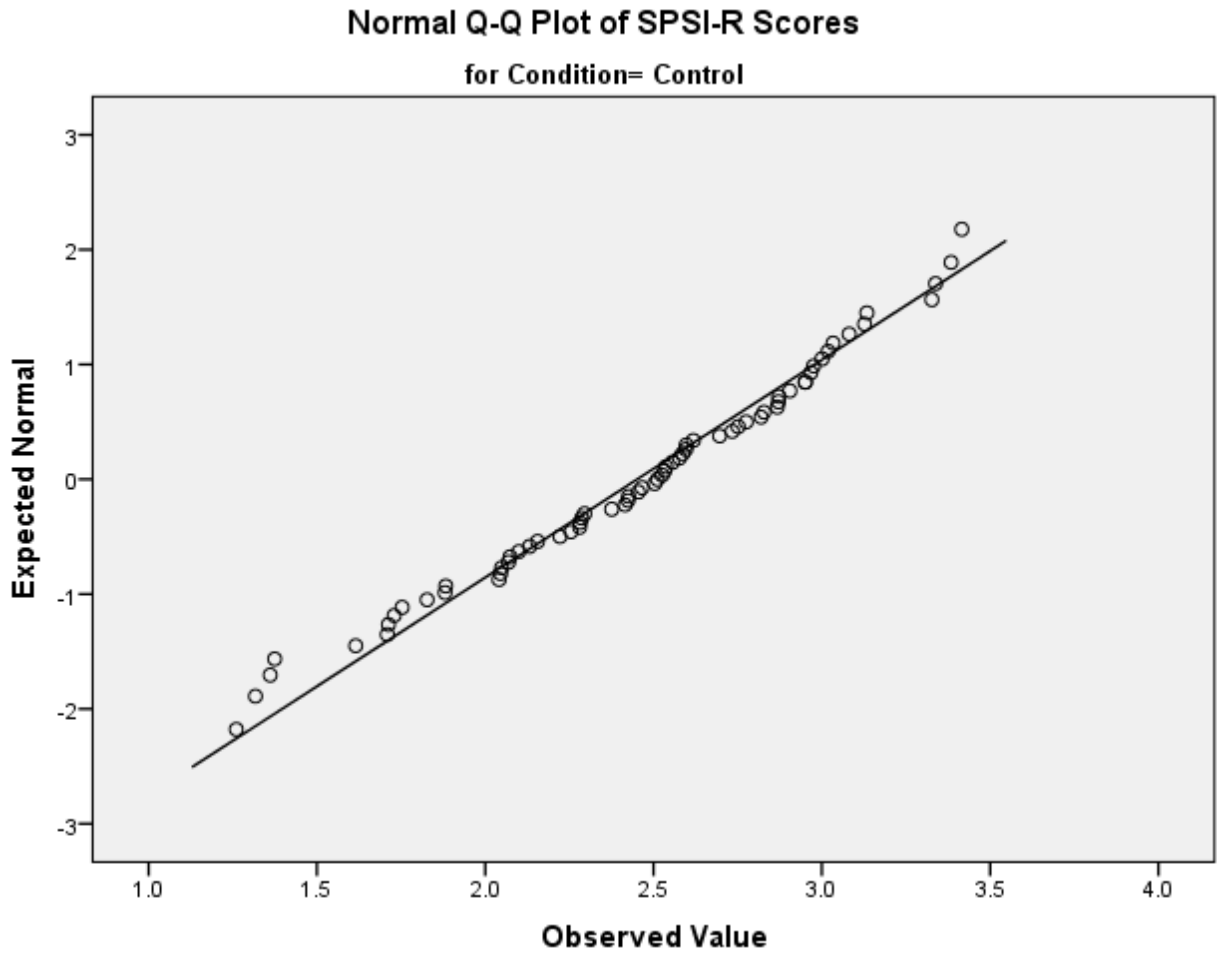
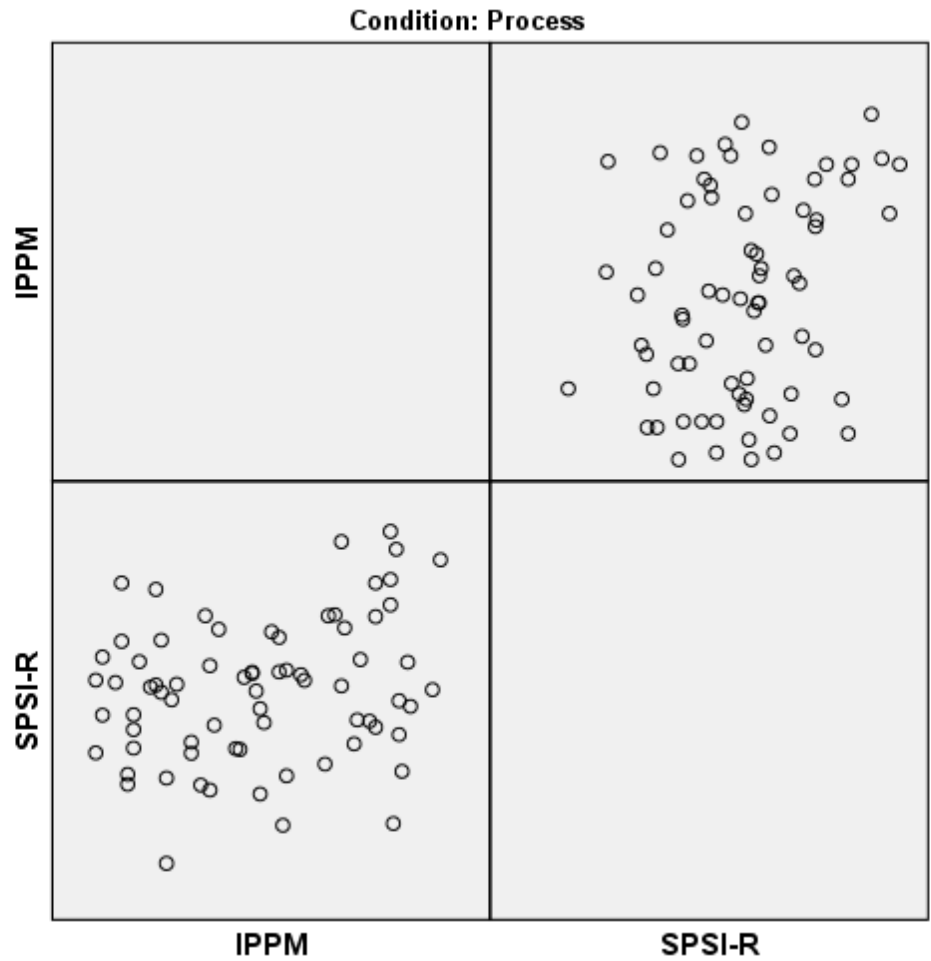
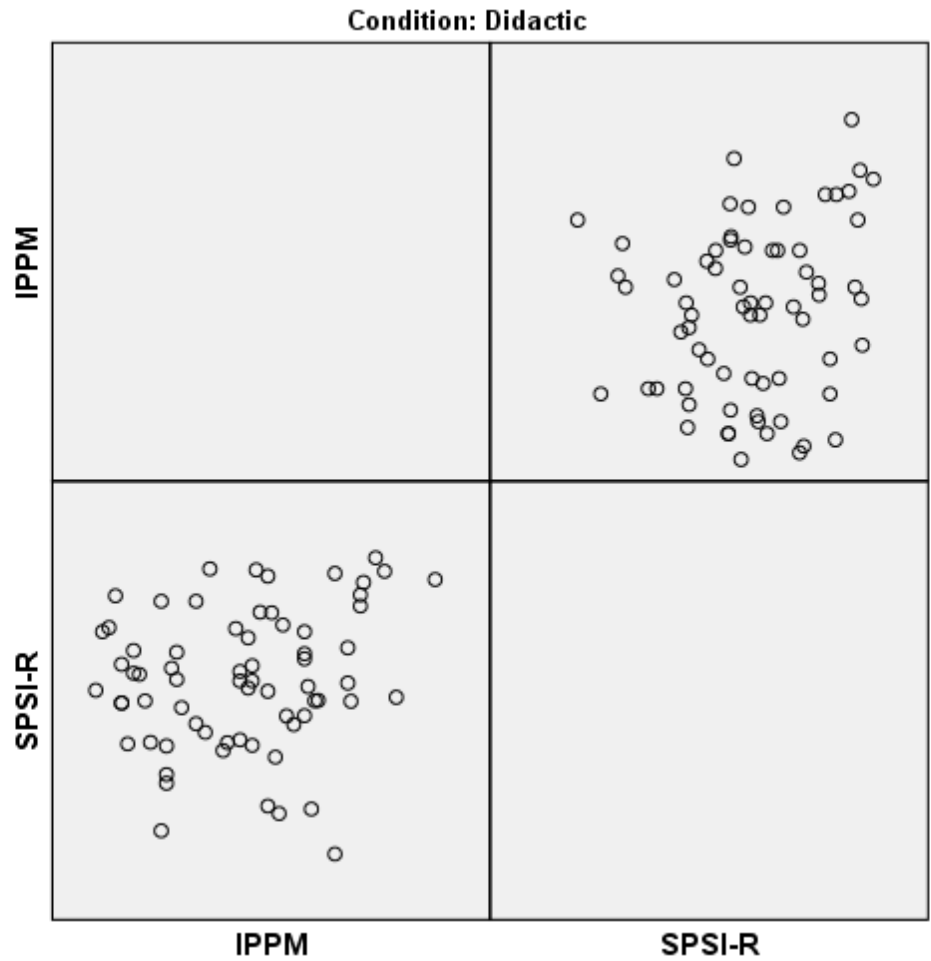


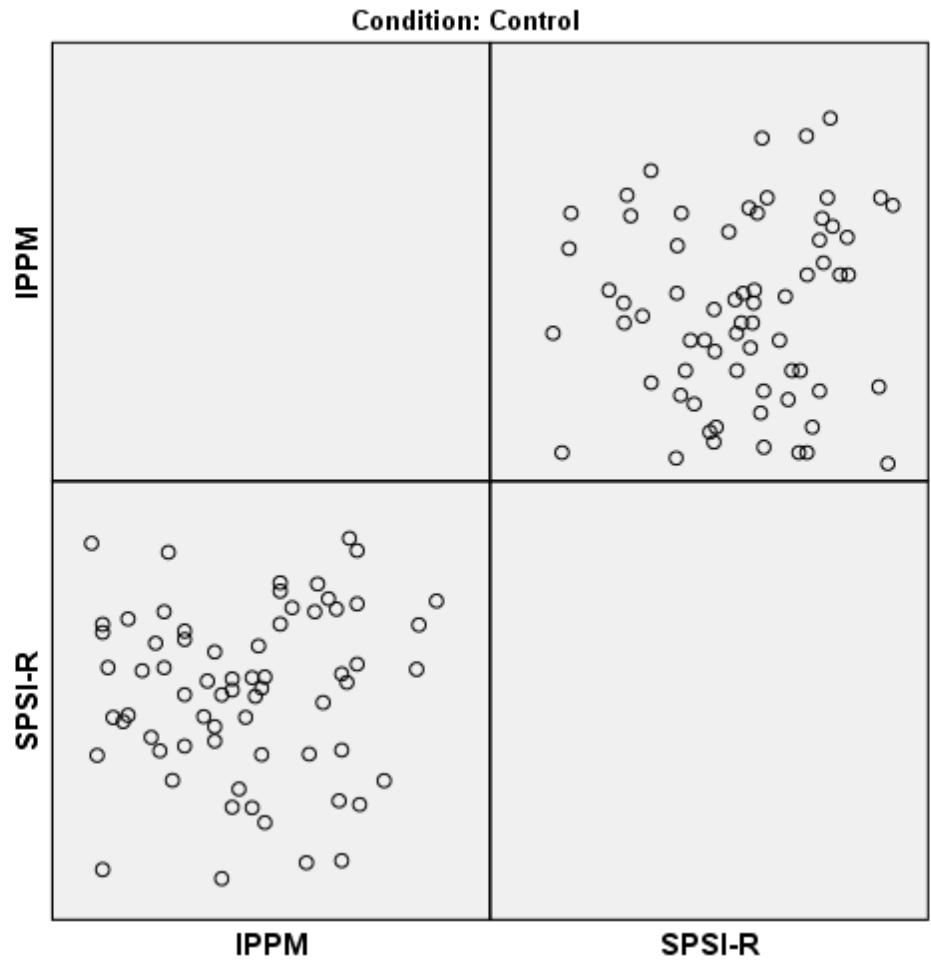
Figure 22. Normal Q-Q plot for transformed SPSI-R scores by control condition.



*Figure 23.* Scatterplot of transformed IPPM and SPSI-R scores by process condition.



*Figure 24.* Scatterplot of transformed IPPM and SPSI-R scores by didactic condition.



*Figure 25.* Scatterplot of transformed IPPM and SPSI-R scores by control condition.

Table 1. *Modified order of Heppner's (1978) problem-solving steps*

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Establish orientation to the problem-solving process.
1. Approach task head on.
2. Accept that problems are universal.
3. Realize that problems can be dealt with and solutions identified.
Define and formulate the problem.
4. Define the problem clearly.
5. Identify what happens before the problem.
6. Identify what happens after the problem.
7. Identify short-term goals.
8. Identify "big-picture" factors that might affect the problem.
Generate hypothesis and solutions.
9. Generate hypothesis about the cause of the behavior.
10. Brainstorm a list of possible solutions to the problem.
Evaluation and decision making
11. Consider all possible solutions.
12. Consider will the solution help you meet your goal.
13. Consider possible negative consequences of implementing solution.
14. Determine if it is practical to implement the solution.
Select and implement solution.
15. Select the best available solution.
16. Identify responsibilities for implementation.

---

Table 2. *Summary of prior studies*

Authors (Year)	Standardization of the Consultation process	Traditional consultation exposure	Use of overt process statements
Anderson et al. (1986)	Y	N	N
Cleven & Gutkin (1988)	Y	Y	Y
Curtis & Watson (1980)	N	Y	N
Revels & Gutkin (1983)	Y	Y	Y
Robbins & Gutkin (1994)	Y	Y	Y
Watson & Kramer (1995)	Y	N	N
Zins & Ponti (1996)	N	N	Y

Table 2 continued. *Summary of prior studies*

Authors (Year)	Direct measure of process knowledge	Control condition	Didactic condition
Anderson et al. (1986)	N <sup>1</sup>	Y	N
Cleven & Gutkin (1988)	N <sup>2</sup>	Y	N
Curtis & Watson (1980)	N	N	N
Revels & Gutkin (1983)	N <sup>3</sup>	Y	N
Robbins & Gutkin (1994)	N <sup>4</sup>	N	N
Watson & Kramer (1995)	N <sup>5</sup>	N	Y
Zins & Ponti (1996)	N <sup>6</sup>	Y	N

Analysis of participant skills

<sup>1</sup> Understanding of behavioral principles and interventions.

<sup>2</sup> Behavioral description of the identified behavior.

<sup>3</sup> Ability to efficiently brainstorm the problem behavior.

<sup>4</sup> Observable changes in participant behavior.

<sup>5</sup> Skill in problem identification and analysis.

<sup>6</sup> Problem description and inferences made about the problems.



Table 3. *Study design and procedures*

Qualtrics					
Participant Recruitment	Informed Consent	Random Assignment	Pre-condition Measure	Independent Variable	Dependent Variable
			Demographic questionnaire	Consultation process video	Ordered Tree method, SPSI-R (modified)
			Demographic questionnaire	Direct training in problem-solving	Ordered Tree method, SPSI-R (modified)
			Demographic questionnaire	Control video	Ordered Tree method, SPSI-R (modified)

Table 4. *Participant demographics*

	<i>N</i>	$\bar{x}$ ( <i>SD</i> )
Age	207	46 (13.19)
Female	143	
Male	64	
School-Based Experience	207	16.30 (11.30)
Education		
Bachelors or Less	100	
Graduate	107	
Age Range		
22-29	25	
30-39	51	
40-49	44	
50-59	47	
60-69	36	
70-76	4	
Geographic Location		
Northeast	56	
Southwest	51	
Midwest	42	
Southwest	23	
West	32	
Unidentified	3	

Table 5. *Goodness-of-fit indices of the five-factor model for SPSI-R:L and modified*

Index	Current Sample ( <i>N</i> = 207)	Sample A† ( <i>N</i> = 601)	Sample B† ( <i>N</i> = 323)
Degrees of Freedom	542	1264	1264
Chi <sup>2</sup>	773.50	3199.26	2525.46
Chi <sup>2</sup> <i>p</i> value	<i>p</i> < .01	<i>p</i> < .01	<i>p</i> < .01
RMSEA	.059	.051	.056
<i>p</i> (RMSEA < .051)	.022	1.00	.620
RMSR	.061	.061	.074
AGFI	.79	.80	.74
CFI	.89	.86	.85

† As reported by D'Zurilla et al. (2002).

Note: RMSEA = Root Mean Squared Error Approximation; *p*(RMSEA < .05) = *p* value for test of close fit; RMSR = Root Mean Squared Residual; AGFI = Adjusted Goodness-of-Fit Index; CFI = Comparative Fit Index.

Table 6. *Modified SPSI-R coefficient alpha statistics*

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Number of Items	32
Number of Cases	207
$\bar{X}$	63.27
Variance	181.03
Standard Deviation	13.45
Coefficient Alpha	0.86

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Table 7. *Modified SPSI-R item total statistics*

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1.	60.57	170.499	0.396	0.557	0.855
2.	60.4589	173.444	0.282	0.423	0.858
3.	60.6812	170.179	0.365	0.46	0.856
4.	60.8986	168.791	0.474	0.465	0.853
5.	61.1981	165.053	0.502	0.497	0.852
6.	60.8164	168.287	0.47	0.395	0.853
7.	60.5459	167.482	0.531	0.511	0.852
8.	60.8889	165.847	0.553	0.498	0.851
9.	60.8599	169.364	0.468	0.494	0.854
10.	60.4928	170.086	0.427	0.537	0.855
11.	60.9614	171.057	0.365	0.414	0.856
12.	61.0435	163.081	0.66	0.604	0.848
13.	60.8164	165.219	0.584	0.675	0.85
14.	60.5507	170.297	0.415	0.597	0.855
15.	60.8213	168.73	0.501	0.515	0.853
16.	60.7585	168.029	0.564	0.632	0.852
17.	61.0145	172.587	0.291	0.31	0.858
18.	61.2367	164.861	0.555	0.54	0.851
19.	60.8164	165.733	0.597	0.588	0.85
20.	60.657	168.023	0.565	0.654	0.852
21.	60.8261	166.232	0.603	0.63	0.85
22.	62.0097	179.524	0.027	0.423	0.864
23.	62.57	176.877	0.123	0.46	0.862
24.	62.2271	176.419	0.134	0.32	0.862
25.	62.3623	175.087	0.183	0.431	0.861
26.	62.372	174.06	0.228	0.576	0.86
27.	62.2029	176.095	0.129	0.464	0.863
28.	62.0773	173.324	0.262	0.528	0.859
29.	62.4058	172.466	0.256	0.474	0.859
30.	61.9469	174.051	0.202	0.467	0.861
31.	61.744	175.463	0.197	0.275	0.86
32.	62.4058	174.922	0.187	0.576	0.861

Table 7 continued. *Modified SPSS-R item total statistics*

	Mean	Standard Deviation
1.	2.6957	0.93431
2.	2.8068	0.90915
3.	2.5845	1.02935
4.	2.3671	0.92457
5.	2.0676	1.13858
6.	2.4493	0.96848
7.	2.7198	0.92366
8.	2.3768	0.99662
9.	2.4058	0.89202
10.	2.7729	0.90931
11.	2.3043	0.94977
12.	2.2222	1.00431
13.	2.4493	0.98832
14.	2.715	0.91424
15.	2.4444	0.88436
16.	2.5072	0.84111
17.	2.2512	0.97776
18.	2.029	1.05625
19.	2.4493	0.93792
20.	2.6087	0.83986
21.	2.4396	0.90036
22.	1.256	0.91755
23.	0.6957	0.97996
24.	1.0386	1.00892
25.	0.9034	1.01462
26.	0.8937	0.99431
27.	1.0628	1.09319
28.	1.1884	0.97953
29.	0.8599	1.09486
30.	1.3188	1.086
31.	1.5217	0.9075
32.	0.8599	1.02146

$N = 207$

Table 8. *Shapiro-Wilk test of normality without transformation*

		Statistic	Degrees of Freedom	<i>p</i> Value
IPPM	Process	.927	72	.000**
	Didactic	.959	68	.025*
	Control	.953	67	.013*
SPSI-R-Modified	Process	.972	72	.110
	Didactic	.973	68	.143
	Control	.982	67	.465

Table 9. *Shapiro-Wilk test of normality following transformation*

		Statistic	Degrees of Freedom	<i>p</i> Value
IPPM	Process	.941	72	.002*
	Didactic	.971	68	.114
	Control	.970	67	.102
SPSI-R-Modified	Process	.972	72	.110
	Didactic	.973	68	.143
	Control	.982	67	.465



Table 10. *Shapiro-Wilk test of normality following transformation*

		Skewness		Kurtosis	
Process	IPPM	0.53	SE = 0.283	-1.301	SE = 0.559
	SPSI-R†	0.86	SE = 0.283	-0.219	SE = 0.559
Didactic	IPPM	0.72	SE = 0.291	-0.895	SE = 0.574
	SPSI-R†	-0.285	SE = 0.291	-0.328	SE = 0.574
Control	IPPM	0.85	SE = 0.293	-0.889	SE = 0.578
	SPSI-R†	-0.352	SE = 0.293	-0.409	SE = 0.578

SE = Standard Error

†Modified version of the SPSI-R

Table 11. *Descriptive statistics for the transformed IPPM total score*

	<i>N</i>	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
Process	72	1.74	.47	1.63	1.85	1.00	2.57
Didactic	68	1.67	.39	1.57	1.76	1.00	2.55
Control	67	1.86	.45	1.75	1.98	1.09	2.84
Total	207	1.76	.44	1.70	1.82	1.00	2.84

Table 12. *Post hoc analysis of IPPM total scores*

Comparison	Mean Difference	p Value
Didactic – Control	-0.20	0.30
Didactic – Process	-0.08	0.91
Process – Control	-0.12	0.33

## Appendix A

### Demographic Questionnaire

Select the option that describes you.

Female

Male

Please list your age?

Please identify the highest educational description that best describes your educational background.

Some high school

High school diploma

College coursework

Associates degree

Bachelor's degree

Graduate or professional (i.e., physician, lawyer) training

Other

Do you currently, or have you ever, worked as a licensed educator?

Yes

No

How many years of experience do you have as a licensed educator?

As a licensed educator, in which grade levels do you have experience? (Check all that apply)

Individual grade levels spanning preschool to twelfth grade and special education included in the participant response options.

## Appendix B

### Modified Instructions for the Social Problem-Solving Inventory – Revised

Instructions: Below are some ways that you might think, feel, and act when faced with problems in everyday living. We are not talking about the ordinary hassles and pressures that you handle successfully every day. In this questionnaire, a problem is something important in your life that bothers you a lot, but you don't immediately know how to make it better or stop it from bothering you so much. The problem could be something about yourself (such as your thoughts, feelings, behavior, health, or appearance), your relationships with other people (such as your family, friends, teachers, or boss), or your environment and the things you own (such as your house, car, property, or money). Please read each statement carefully and choose one of the numbers below that best shows how much the statement is true of you. See yourself as you usually think, feel, and act when you are faced with important problems in your life these days. Circle the number that is the most true of you.

Questions are rated on a scale of 0 to 4 with the following descriptions for each numerical rating

- 0 - Not at all true of me.
- 1 – Slightly true of me.
- 2 – Moderately true of me.
- 3 – Very true of me.
- 4 – Extremely true of me.

## Appendix C

### Informed Consent

#### INFORMED CONSENT STATEMENT

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##### PS Consultation Study

#### INTRODUCTION

The Department of Educational Psychology at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this research group, the services it may provide to you, or the University of Kansas.

#### PURPOSE OF THE STUDY

This study seeks to examine how exposure to problem sets and approaches affect understanding and procedural retention in participants. Information obtained from this study will be used to better understand the effects of the consultation process.

#### PROCEDURES

In this study, you will be asked to complete a questionnaire regarding your general demographic information, we will ask you to determine the order of a series of steps as they relate to the consultation process, and rate the degree to which you agree or disagree with orientation statements. You will view a short video covering aspects of a problem. During the video, we will ask that you place yourself in the role of a person experiencing a problem. The complete study is expected to last approximately 30 minutes.

#### RISKS

There are no risks anticipated for participants completing this study.

#### BENEFITS

As a participant, you are not likely to experience any direct benefits resulting from this study. Potential indirect benefits include an improvement in educational services.

#### PAYMENT TO PARTICIPANTS

Participants in this study will be compensated by the Qualtrics team following previously agreed upon payment standards

#### PARTICIPANT CONFIDENTIALITY

Your name will not be associated in any publication or presentation with the information collected about you or with the research findings from this study. Instead, the researchers will use a study number or a pseudonym rather than your name. No personally identifiable information will be collected or shared unless required by law, or you give explicit written permission. As information will be collected through the online survey software Qualtrics, it is possible; however, that through intent or accident, that someone other than the intended recipient may see your response.

Permission granted on this date to use and disclose your information remains in effect indefinitely. By participating in this study, you give permission for the use and disclosure of your information within the parameters of confidentiality as outlined above for purposes of this study at any time in the future.

#### CONSENT AND AUTHORIZATION REFUSAL

You are not required to participate in this study, and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas, or to participate in any programs or events of the University of Kansas.

#### CANCELLING THIS CONSENT AND AUTHORIZATION

You may withdraw from this study at any time. You also have the right to cancel your permission to use and disclose further information collected about you, in writing, at any time, by sending your written request to:

Steven Lee  
Joseph R. Pearson Hall  
1122 West Campus Road  
Lawrence, KS 66045-3101

If you withdraw from this study, the researchers will stop collecting additional information from you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

#### QUESTIONS ABOUT PARTICIPATION

Questions about procedures should be directed to the researchers listed at the end of this consent form.

#### PARTICIPANT CERTIFICATION

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or (785)

864-7385, write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7568, or email irb@ku.edu.

By continuing, I agree to take part in this study as a research participant. I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

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## Appendix D

### Consultation Process Transcript

Consultation scenario: Justin (J) a psycho-educational consultant meets with Courtney (C) a fourth-grade teacher to discuss the problem of frequent out of seat behavior with her student Mark.

J - So C, you are having problem with a student that you wanted to meet about.

C - Yes, my student's name is Mark, he is in my fourth grade class I have had a lot of problems with him getting out of his seat during class, during discussions, during independent seat work his off wondering around when he shouldn't be.

J - Ok, well first I want to say that I think it is great that you are approaching this task head on [Node 1] and it's important to realize that problems like this happen pretty frequently especially for educators [Node 2], and the only way to deal with it is to approach it head on just like this. I think that when people approach problems in this way they realize that they can cope with problems and come to good solutions that work for them [Node 3]. But before we really get started I would like to give you an overview of what we will be doing, just so that you know where we are going. We will use steps in the problem-solving process to work on this problem. First, we are going to define the problem behavior, and in doing so we will go through and define the actual aspects of the behavior. Here we will talk about things that occur before, during and after the behavior. Then we will talk about your goals for the behavior, some of the big picture aspects of the behavior, what might be causing this behavior, and we will brainstorm a list of possible solutions to the problem. Once we have a nice list of possible solutions we will consider what might work best, and how the selected

solution(s) will help us meet your goal. Finally, we will talk about responsibilities for implementing the solution. Do you have any questions so far?

C – No.

J - Okay, so let's define the problem you are having with Mark clearly and in a way that anyone could see it [Node 4]. From what you were saying earlier, it sounds like Mark frequently leaves his seat during times that he is expected to remain seated.

C – Yes.

J - Okay and how often does this occur?

C - I would say that I probably have to remind him on average about 4 times per hour.

J - That's quite a lot of reminders. So, Mark is getting out of his seat approximately 4 times an hour on any given day, and this occurs during times that he is expected to remain seated.

C – Yes.

J - Well, I feel like we have a pretty clear definition of the behavior, I mean Mark is frequently getting out of his seat during inappropriate times and is causing a distraction in your class. Next, I would like for you to describe for me what happens immediately before Mark leaves his seat [Node 5].

C - Um well just about anything, he could be sitting there working, or supposed to be listening to me, he gets distracted easily so sometimes he just gets up unexpectedly and goes to sharpen his pencil.

J - Okay so it sounds like there may be a number of instances that might lead to this behavior, but are there any particular things that might trigger this behavior?

C - Yes, I think when he gets off-task he is more likely to get out of his seat.

J - Okay, it sounds as if the trigger in this case might be his attention waning during work time.

C – Yes.

J - Okay, let's look at what happens immediately after he leaves his seat. Here we are especially looking for factors that might be rewarding or maintaining his leaving his seat [Node 6].

C - Well a lot of times he will go sharpen his pencil, fiddle around with different objects, or visit with his friends. Usually I then direct him to go sit back down, and he will usually do it, he is pretty compliant, but he gets pretty distracted and doesn't stay seated very long.

J - It sounds like what may be encouraging Mark to leave his seat that the attention he gets from interacting with his peers or is getting some sort of physical stimulation.

C - Probably.

J - Well now that we have defined the problem behavior, and have discussed what seems to trigger the behavior as well as what tends to occur following the behavior, I feel like we have a pretty good understanding of what is going on.

C – Ok.

J - Now I would like to talk about your goals for the behavior, how would you like to see Mark's out-of-seat behavior change over the short-term term, say three-weeks [Node 7]?

C - Well he is a pretty active kid, so I know he is always going to be pretty active. But I would like to see him try to stay in his seat when it's appropriate, especially when I am teaching and the class's attention should be on me. So, for the time frame of three weeks I think I would like to only have to remind him about two times in one hour.

J - Okay, so only two reminders in a one hour period, that might be a lot for Mark given how long this has been occurring but we can always shoot for it and reconsider our plan if necessary.

C - Sounds good.

J - Now let's think longer-term. What are your goals for Mark's behavior six months down the road?

C - I would like to see Mark stay in his seat an entire hour without any reminders.

J - So it sounds like you want Mark to be sitting in his seat attending to the lesson or his work for an entire hour as your long-term goal?

C - Yes.

J - Well now that we have defined the behavior and your goals, now we need to talk about some of the big picture factors like home, peers or his academic skills that might be influencing Mark's out-of-seat behavior [Node 8].

C - Well he comes from a nice family, he is with his mom a lot because I think his dad works a lot.

J - That's helpful, is there anything else about his family that might be useful in working with him?

C - No.

J - What about his friends?

C - He is well liked, he is a nice kid. Sometimes though, when he is walking around class, he gets the other kids laughing.

J - It sounds like you are saying that he gets to be a clown sometimes by walking around class.

C - Perhaps.

J - Do you think that this might be seeking attention from his peers by walking around in the class?

C - That's a possibility, he does seem to really enjoy attention from others.

J - That's interesting, is there anything else that you can think about that might be useful to know about Mark that might be affecting or causing this behavior?

C - I can't think of anything no.

J - Okay, well now we have clearly defined Mark's problem as out-of-seat behavior and identified some of factors that might influence and then talked about your goals for improvement for Mark. Now it is time to develop a hypothesis about what might be causing Mark's behavior and begin to come up with some solutions that might work to reduce this problem.

C – Okay.

J - Based on what we have been talking about, what are some of the reasons that you think contribute to Mark's out-of-seat behavior [Node 9]?

C - Well like I said, I think Mark is just an active kid but I also think that the attention he gets from his friends is a big reason he is getting out of his seat often.

J - Okay so far sounds as if you feel like there are three reasons, first he just requires lots of physical activity, second he enjoys getting attention from his peers, and earlier you also said that Mark seems to get out of his seat more often when he is off-task.

C – Yes.

J - From what I am hearing about Mark, that sounds entirely plausible, perhaps Mark is seeking out some physical stimulation and he also enjoys and perhaps seeks out peer attention. It also might be that he finds the work boring or too difficult resulting in him being off-task. Now considering our hypothesis about the reasons that Mark might leave his seat so frequently, let's use our hypothesis to brainstorm a list of possible solutions [Node 10] for Mark's out-of-seat problem. For brainstorming, it's important to just throw out as many

ideas as possible and later we will consider their merit, but for now, let's just throw some ideas out there.

C - Ok, well I know that for some other kids that I have had that required physical stimulation I would give them some sort of manipulative to keep them stimulated.

J - Great, maybe we could work in some breaks, or we could give him some sort of signal that he could use to inform you of when he needs to take a break, and then as he starts to use the signal, we could work on increasing the time between breaks later.

C - That makes sense.

J - We could also help him to self-monitor his off-task behavior with a card system. So, maybe he wouldn't be off-task as much and feel the need to leave his seat.

C - We have a class-wide system; maybe we could work it into that.

J - So we could work a class-wide reward system into our intervention. What if we work in some type of reward where he gets something like peer attention, your attention, or class attention for staying in his seat?

C - Ok.

J - What else.

C - I think I am out of ideas.

J - Ok you know, I am feeling pretty good about these ideas that we already have, what about you?

C - Yes.

J - So just as a quick summary of what we have done so far, not only have we defined the behavior, considered factors that seem to influence it and talked about your goals; we have also created a hypothesis about what might be causing his out-of-seat behavior that included

a combination of peer attention, a physical need to get up and move around all triggered by inattention to the task at hand. We developed some possible solutions that we can use to reduce his out-of-seat behavior that included breaks, a class-wide reward system or self-monitoring when he is off-task. Now, let's consider each of our proposed solutions [Node 11] by considering which one might work best. To do this, let's think about three things for each one: 1) will it help us reach our goal [Node 12]; 2) is it possible to actually implement this in the classroom [Node 14] and; 3) what could potentially happen to Mark or anyone else if the solution were to be implemented [Node 14].

C – Ok.

J - So let's start by fleshing out each of the ideas so we would know what would be included in each before considering the cost and benefits of each So, for the physical stimulation idea, maybe we could ask him to signal when he needs a break and would like to move by raising his hand. Then, I could nod and allow him to get up for a set time, say 2 minutes. Maybe we could give him a card that allows 5 of these per day.

C - That sounds good.

J - How would you see the class-wide system working?

C - Since each student can select their own rewards, maybe we could allow him to accumulate points by staying in his seat. He could then cash them in for time spent being with and talking to his friends.

J - That sounds good. On the self-monitoring program, we could sit down with him and set goals for reducing the out-of-seat behavior to our goal level. We could provide him with a card for monitoring both his out-of-seat behavior and also times when he considered getting up but didn't. We could then ask him to keep track of these events and chart them daily. Perhaps,

you could go over his self-monitoring recording daily spend some time with him when he reaches his goals.

C- Ok, that makes sense.

J - Now, let's consider these ideas and compare them [Node 11] to see which one we think would help us reach our goal [Node 12] quickest but also which one would be the easiest to implement [Node 14] and would cause the least disruption or have the fewest side effects [Node 13] on the classroom.

C - Ok, well I think any of them if they worked would help us reach our goals. But, I think the class-wide idea would be the easiest for me to implement and would cause the least disruption in the classroom since it is a system we already have in place.

J - Great, so since our next step is selecting the idea we would like to implement, would you like to select the class-wide system to use for Mark's out-of-seat behavior [Node 15]?

C - Yes, I think that's the best one to go with at this point.

J - Great, what can I do, and what do you need to do to get this plan started? I think we need to remember that no matter what we finally decide on, that we need to do it consistently to know whether it's working or not. Is there anything that you think I can do to help you get this intervention implemented [Node 16]?

C - No I think this is something that I can do on my own.

J - Well I will check in with you in two days or so to see how you are doing, and let's go ahead and make a plan to meet in about a week to see how Mark is progressing at that time and if we think he will make our two-week goal of leaving his seat only two times per hour during seat time.

C - Okay that sounds good.



## Appendix E

### Didactic Condition Transcript

#### SLIDE 1

Welcome, let's talk about problem solving.

In this presentation, we'll focus on the steps of problem solving especially as it relates to educational problems, or educational situations. So, let's get started.

Problem solving has been the topic of research for many years. However, less is known about applied uses for the problem-solving process. We know that all of us solve problems in our daily life, and we do so by using it in many different troublesome situations. For the purpose of this presentation, I am going to talk about problem solving in educational situations with students, or groups of students.

We know that problem solving is a step-by-step process. Characterized in general by several major steps that include a general orientation to problem solving, problem definition and formulation, generating alternatives, and decision-making.

#### SLIDE 2

Let's in turn discuss each of these steps of problem solving, by beginning with step number one, general orientation.

Our general orientation to problem solving includes behaviors, attitudes, and beliefs about problems and our ability to solve them. People who are successful in solving problems are comfortable in approaching the task, whereas others may be reluctant and tend to put off problem solving. The degree to which we can accept that problem situations happen to all of us, is a belief that assists good problem solvers. The recognition that we can cope with problems and

come up with good solutions that will solve the problems is a key element for good problem solvers.

### SLIDE 3

After we possess a good general orientation to problem solving in step one, we can begin step two which is called problem definition and formulation. Here, we are interested in defining a problem with a student behaviorally in a way that anyone who observes it would agree that the behavior or problem has occurred.

Next, we consider the antecedents, or things that might trigger – or cause this problem.

Next we consider what happens immediately after this problem occurs, what are some of the consequences that may be maintaining it.

Next we consider the goal, what are our goals for improvement, either in behaviors that we want to see increase, or in behaviors that we want to see decrease to reduce the problem situation.

Finally, we consider the ecological influences, this might include the classroom, might include peers, parents, or any other ecological influence on the problem.

### SLIDE 4

After having completed step two, we are now ready for step three of the problem-solving process, generating alternatives. In this step, we use information obtained in step two about the problem itself as well as influences on the problem, and our goals. Using this information we develop a hypothesis about what we think might be influencing the behavior. Good problem solvers grasp the essence of the problem, meaning that they understand key influences that might be changed to develop solutions. In the next step - solution generation - approaches such as brainstorming are used to identify as many possible solutions for the problem as possible.

### SLIDE 5

With a number of solutions on the table, we are ready to move on to problem-solving step number four – decision making. Here we consider each of the possible solutions in turn with reference to the probability of success for each of the solutions in reaching our predetermined goals.

The utility of each solution is considered as to whether or not we believe it would actually work in the environment where it is planned, and do we have the resources to be successful in implementation?

Finally, the consequences of each solution are considered for the student, or for surrounding students, or the teacher, or anyone in the classroom environment.

Considering these factors, we make a selection of a solution that we think has the optimal probability for success.

Responsibilities for implementation come next, and the discussion of who will be responsible for generating materials, or implementing the details of the solution.

#### SLIDE 6

In summary, problem solving is something we all do; it is part of our daily lives. Problem solving is used extensively in education for problems with individual students, groups of students, whole schools, or districts. However, this is little complete or systematic use of the problem-solving process. Professionals in schools like psychologists, teachers, principals, social workers, all want to help others to solve educational problems; however, all of the steps in problem solving are important to use to generate good outcomes. It's important that professionals learn to use the problem-solving steps in an effort to help children to do their best educationally in school.

## Appendix F

### Control Condition Transcript

Consultation scenario: Justin (J) a coworker meets with Courtney (C) a fourth-grade teacher to discuss the problem of frequent out of seat behavior with her student Mark.

J - Hey Courtney.

C - Hey how's it going?

J - Pretty good, I hear you're having problems with one of your students.

C - Yeah, Mark, he's in my fourth grade class, just a really hyperactive kid. I've had a lot of problems with him this semester getting up and wondering around the classroom. He'll do it just about any time it seems like, when I'm talking, up in front of the class, when he is supposed to be working on seatwork. It's just been a huge problem all year.

J - Yeah, you know what's weird about Mark is that I hear he actually comes from a really good family.

C - Yeah, I meet his parents both at the beginning of the year, they're both really nice. They have good jobs, they seem to be concerned with how Mark is doing in school. So just really nice all around people. I asked them if they've been seeing the same behaviors at home that I've seen in the classroom. They said that they have a really hard time getting him to finish his chores, getting him to finish his homework, he just gets distracted really easily, he gets off task really easily.

J - Yeah, actually Mark is a pretty good kid too.

C - He's a really nice kid, he gets along really well with other students. I've never had any behavioral problems per se with him. Obviously the wondering around the classroom is a behavioral problem, but I don't feel like he does it intentionally. If I ask him to go sit down

he does and he seems sorry. But just a few minutes later something distracts him or catches his eye and he's up again.

J - It sounds like he just has a case of the wiggles really.

C - Definitely, a lot of energy. I've observed him out on the playground at recess and he will just run in circles around. Lots of energy.

J - I've talked to a few other teachers about him as well, and it seems like he is always active. I think he came here in second grade, so he's been here with us for about two years now. It seems like everybody I've talked to has talked about how he is constantly on the move and they've tried a couple of things with him and it seems like they are having constant problems with him.

C - I know that last year there were a lot of problems with him blurting out answers in class. But that's actually gotten a lot better.

J - That's good to know.

C - I've been working with him on it. I taped a picture of a little boy raising his hand on his desk, and I'll just point to that and remind him. He still does it of course occasionally. But he has gotten a lot better about it.

J - That's good that you did that because that is one thing I forgot that a teacher had mentioned in the past that was something that he constantly yells out in her class.

C - It bothers me a lot more, the getting up and wondering around. Because he will do that even when I am up teaching. Obviously it is pretty distracting and I am sure that you can see how that would drive me nuts.

J - Like I was saying, it sound like something that he has been doing since he has been here. I don't know about the school before. But since he arrived her it is something that he has constantly been doing.

C - I talked to Sarah, she was his teacher last year in third grade. She had a lot of the same problems. She tried all sorts of things, talking to him constantly, she tried sitting down with him and coming up with a list of times that it would be appropriate for him to get up versus times that he really needs to stay in his seat. It didn't really seem to get through to him, he still got up and did whatever he wanted to.

J - It sounds like with Mark, I don't know it's a pretty tough situation, I don't really know what kind of advice to give you. I feel like, I don't know, have you tried checking into getting a para for your class? I feel like maybe it won't necessarily fix the problem with Mark, but by having a para, but maybe within your particular classroom by having a para it might allow you to focus on your students a little more.

C - I don't know, with funding and all that, that that is something that they would allow us to look into. It would be nice if I could get him out of the classroom sometimes. Maybe he could go somewhere and get his energy out, and he would be able to be more focused when he came back and then I wouldn't have him distracting the other kids and I could really focus on him a little bit more.

J - I don't know, the thing with Mark is that people have tried a lot of different things with him, and it seems like nothing is really working with him so far. I don't really know what to tell you about him, he seems like he's a pretty good kid, but he seems like he's a pretty tough guy to work with. How are the other kids in your class?

C - Pretty well, I have a few other behavioral problems, but they seem to be things that I am able to deal with. I have a kid, Shawn, I am sure that you have heard of him. He has been very confrontational all year with other students. He even got into a fight last month with an older student on the playground, that was pretty concerning. Then I've had a couple of girls that talk constantly, I am sure that you've had those in your classroom, I am working on them. It doesn't even matter who I sit them by, they keep talking no matter who it is. But I am working on them and it's pretty easy to deal with.

J - I don't know what it is, and I feel so old when I say this, but it just seems like something is really different between the way that we were and the way kids are now. I remember when I was a kid that getting up out of your seat or talking when the teacher is teaching, stuff like that is stuff that you just didn't do. I don't know what it is, but it just seems like something is really different now.

C - Definitely, you may be right with the video games, they just don't seem to play outside and get all that energy out after school now so it just builds up and they have so much energy.

J - There was one kid who I heard about a couple weeks ago, the parents got really upset because this kid was constantly moving and so I don't know if it was bad judgment, or a joke, or what, but they decided to tape their kid down, which is really a bad idea. Then they took pictures of it and sent the pictures around as a joke, but somebody reported it. Obviously they got the email and they knew who it was and they reported it. They investigated it, I don't know what came of it. It seems like it was one of those "strike one" kind of deals, but I don't know.

C - Sometimes people do really stupid things.

J - So no taping Mark down.

C - Ok I won't tape Mark to the chair.

J - I've been having trouble with Mark, it seems like it should be pretty straight forward, but it seems like nothing is working with him. I am really just scratching my head here, because it's not like we're talking about any real academic difficulty here but we are talking about something that is affecting your classroom.

C - He is a good student, he is pretty compliant otherwise. I am just really at a loss of what to do with him.

J - Maybe someone is causing him to get out of his seat. Have you thought about what causes it, or what comes before?

C - It seems like it can happen just about any time. Like I said earlier, he can be working on independent work at his seat, I can be up teaching the whole class, if he's in small groups, it's happened in all sorts of subjects. Though it doesn't really happen in specials all that much, but besides that it seems like it can happen almost anytime.

J - Yeah, I don't know. If there's nothing that is really predicting when he gets out, then I don't know what we can do. I feel like your expectations for him are pretty typical for a fourth grade student. It seems like the other kids in your class don't have problems with this.

C - No, and I don't expect him to be perfect I mean he is a really energetic kid. I know that he is going to continue to be energetic and that is fine, and I know that there are going to be times where he needs to get up and stretch his legs or whatever, but I especially want to work on when he is getting up while I am teaching, I mean that is a real distraction. The kids start watching him, they want to see what he is going to do next. He can be a bit of a class clown, he will crack jokes when he is up sometimes, or play around with other things and get the kids laughing. So definitely a distraction when I am trying to teach.



J - So it sounds like he is getting to talk to some of his classmates, that might be part of it. What types of things have you tried with him?

C - I've talked to him obviously. I have a classroom-wide reward system that I do, and that has worked pretty well for other kids, but for Mark it seems like if he did earn a reward or trinket, you know I have little rewards that they can earn, he would either lose it or break it and it would be gone by the end of the day. He didn't seem real motivated by it I guess.

J - So it sounds like the trinkets aren't working.

C - No I don't think they really did much for him.

J - That's weird, what about the other students, are the trinkets working for them?

C - Yes, I have a couple of students that it works really well for, I had a lot of problems at the beginning of the year with kids not bringing their work back. They would either not do it completely or get it stuffed in the bottom of their backpacks and they would not find it until the end of the week when I had them clean out their backpacks. So it has worked pretty well to increase kids turning their homework in if they get rewards. I also have a kid who was extremely shy at the beginning of the year, and wouldn't speak out much in class, so I started giving out trinkets for times that she spoke up and talked during class and that seemed to work really well.

J - I am thinking about something I learned in undergrad, about the trinkets, are we talking about the same types of things, or different things here.

C - I have a box that has a variety of things, erasers, pencils, stickers those types of things.

J - One of the things I was thinking about was how you always needed to be thinking about what is effective for a particular student. So the story that they used was, you can have two students and have them wash the board. For one student washing the board might be a

reward for being good in the class for the day, or doing their homework or something like that, and they get to wash the board it's nice or something that is fun for them. But for another kid, washing the board is a punishment, and it's the worst thing ever. I am wondering if we ought to look at changing it up for Mark.

C - It's interesting, something to think about definitely.

J - Is there anything else that you can think about that might work for him?

C - I am pretty much at a loss; I feel like I've tried everything with him. It just seems like not much works with the kid.

J - Do you think that maybe you could change the reward for him, I don't know maybe use something that is more interesting for him? I am just wondering if maybe the trinkets aren't that interesting for him, or maybe there is something else. What do you think?

C - I don't know maybe I could talk to Mark and see what he thinks might be interesting. He might be able to come up with some ideas. Maybe it might not even be a physical thing, maybe he might be able to have some time to visit with some of his friends, like hang out in the back of the classroom on a computer or something for 10 minutes at the end of the day.

J - Yeah that sounds really good. I will be interested to hear how it goes. Let me know how it turns out. Well I've got to go. I've got to get to class.

C - Ok.

J - I'll see you later.

C - Yeah, thanks for talking to me.

## Appendix G

You have completed the survey, thank you for your time. This study sought to improve understanding of the problem-solving process when used by consultants to improve another adult's (e.g., parent or teacher) understanding of how to effectively identify, and resolve problem behaviors exhibited by children. Your involvement in this study will aid in understanding this process. Thank you again for participating.