



Size and consistency of problem-solving consultation outcomes: An empirical analysis

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ABSTRACT

In this study, we analyzed extant data to evaluate the variability and magnitude of students' behavior change outcomes (academic, social, and behavioral) produced by consultants through problem-solving consultation with teachers. Research questions were twofold: (a) Do consultants produce consistent and sizeable positive student outcomes across their cases as measured through direct and frequent assessment? and (b) What proportion of variability in student outcomes is attributable to consultants? Analyses of extant data collected from problem-solving consultation outcome studies that used single-case, time-series AB designs with multiple participants were analyzed. Four such studies ultimately met the inclusion criteria for the extant data, comprising 124 consultants who worked with 302 school teachers regarding 453 individual students. Consultants constituted the independent variable, while the primary dependent variable was a descriptive effect size based on student behavior change as measured by (a) curriculum-based measures, (b) permanent products, or (c) direct observations. Primary analyses involved visual and statistical evaluation of effect size magnitude and variability observed within and between consultants and studies. Given the nested nature of the data, multilevel analyses were used to assess consultant effects on student outcomes. Results suggest that consultants consistently produced positive effect sizes on average across their cases, but outcomes varied between consultants. Findings also indicated that consultants, teachers, and the corresponding studies accounted for a significant proportion of variability in student outcomes. This investigation advances the use of multilevel and integrative data analyses to evaluate consultation outcomes and extends research on problem-solving consultation, consultant effects, and meta-analysis of case study AB designs. Practical implications for evaluating consultation service delivery in school settings are also discussed.

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1. Introduction

Problem-solving consultation is widely held as an effective model of service delivery (Sheridan, Welch, & Orme, 1996) and is the most commonly used consultation model in school settings (Bramlett, Murphy, Johnson, Wallingsford, & Hall, 2002; Costenbader, Swartz, & Petrix, 1992; Wilczynski, Mandal, & Fusilier, 2000). Empirical support for this model has been accumulating even before Bergan (1977) first delineated the four-stage model more than three decades ago (Medway, 1979). Problem-solving consultation follows a process consisting of *problem identification*, *problem analysis*, *plan implementation*, and *problem evaluation*, with interviews accompanying all stages but the third (Bergan & Kratochwill, 1990; Kratochwill & Bergan, 1990). The model has had enduring appeal

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in providing a framework for (a) organizing assessment and intervention process and activities and (b) incorporating evidence-based techniques from diverse theoretical orientations and approaches (Frank & Kratochwill, 2014). Although originally based on the tenets of behavioral modification, the term *problem-solving consultation* replaces *behavioral consultation* to better reflect the use of diverse theoretical approaches and the broader focus on the context in which behaviors occur (Kazdin & Hersen, 1980; Kratochwill & Bergan, 1990; Kratochwill, Elliott, & Stoiber, 2002). The value of this model, however, ultimately depends on whether consultants can use it to produce reliable and positive student outcomes.

1.1. Outcome research

Much of the literature documents various types of reliability and validity evidence for using the problem-solving consultation interview process (Hurwitz, Gaebler, & Kratochwill, 2007). Consultant training combined with use of procedural manuals and checklists improves the ability of consultants to consistently complete 80% to 100% of the interview objectives (Beavers, Kratochwill, & Braden, 2004; Kratochwill, Elliott, & Busse, 1995; Kratochwill, VanSomeren, & Sheridan, 1989; Sheridan, Eagle, Cowan, & Mickelson, 2001) and maintain a high level of consistency during their casework (Lepage, Kratochwill, & Elliott, 2004). In addition, Sheridan et al. (1996) found that 95% of 21 studies published between 1985 and 1995 reported positive results, based largely upon teacher (i.e., consultee) reports of treatment acceptability, treatment integrity, and student outcomes. Although teacher perceptions are important, they correlate little with the direct assessment of treatment integrity and student outcomes (Lepage et al., 2004; Noell et al., 2005).

Parents can also participate as co-consultees with teachers in problem-solving consultation, known as “conjoint behavioral consultation” (CBC). Recent research on CBC (Sheridan & Kratochwill, 2008) suggests positive outcomes for this consultation format. Sheridan et al. (2012) conducted a randomized controlled trial (RCT) and reported that CBC, relative to the control condition, resulted in better teacher-reported student adaptive behavior and social skills and parent-reported social skills. Another finding was better teacher–parent relations in the CBC group relative to the control group. More recently in another RCT, Sheridan, Ryoo, Garbacz, Kunz, and Chumney (2013) reported increases in home–school communication and parent competence in problem solving relative to the control condition. Moreover, children in the CBC condition, relative to the controls, demonstrated decreases in problem behaviors (i.e., arguing, defiance, noncompliance, and tantrums).

1.1.1. Effect sizes

Through single-case research designs, many studies use direct and frequent measures of progress during baseline (e.g., “A”) and treatment (e.g., “B”) phases to evaluate the outcomes for an individual student. This assessment allows investigators to compute an effect size for each case; a quantitative index of treatment effects. Effect sizes are also useful for comparing treatment effects across a variety of treatment goals and measures. Negative effect size values indicate worsening of a problem behavior, positive values indicate improvement, and values near zero indicate little or no change. Average effect sizes reported by some problem-solving consultation outcome studies ranged from 0.51 ($SD = 1.04$ with 35 cases and 21 consultants; Lepage et al., 2004) and 0.55 ($SD = 0.55$ with 32 cases and 3 consultants; Beavers et al., 2004) to 1.10 ($SD = 1.07$ with 66 CBC cases and 30 consultants; Sheridan et al., 2001). Additional research and consensus, however, is needed concerning the calculation and interpretation of effect sizes (see Shadish, 2014; Shadish, Rindskopf, & Hedges, 2008).

Single-case consultation outcome studies traditionally relied upon the “no assumptions” approach described by Busk and Serlin (1992) to calculate effect sizes (e.g., Beavers et al., 2004; Busse, Kratochwill, & Elliott, 1995, 1999; Kratochwill & Braden, 2004; Kratochwill et al., 1995; Lepage et al., 2004; Reddy, Barboza-Whitehead, Files, & Rubel, 2000; Schill, Kratochwill, & Elliott, 1998; Sheridan et al., 2001, 2004). In that approach, no assumptions regarding the distribution shape or homogeneity of variance are made. This statistic involves dividing the difference between baseline and treatment phase means by the baseline standard deviation to obtain an effect size. The calculation requires (a) at least two data points during the baseline phase to compute the baseline standard deviation, and (b) that the baseline standard deviation—the denominator—is non-zero. Baseline standard deviations, however, can equal zero when clients generate identical results on every baseline observation (e.g., the same reading fluency scores or the same frequencies of out-of-seat behaviors). This situation may occur more often among cases concerning low frequency behaviors or using too few baseline observations. This study extends and demonstrates use of alternative effect size calculations.

As noted previously in this section, no consensus or formal criteria for judging effect sizes in single-case research exist at this time (see Kratochwill & Levin, 2014; Shadish et al., 2008). Several consultation outcome studies invoked an effect size of +1.0 and greater as indicative of a large positive student outcome, based on Smith and Glass's (1977) contention that it is similar to a z-score and roughly equivalent to one standard deviation above the baseline mean (Kratochwill et al., 1995; Schill et al., 1998; Sheridan et al., 2001, 2004). Other studies, however, evaluated results against Cohen's (1988, 1992) index of 0.2, 0.5, and 0.8 as small, medium, and large effect sizes, respectively (Beavers et al., 2004; Lepage et al., 2004; Reddy et al., 2000; Sheridan et al., 2001). At this time, the traditional use of z-score or Cohen's index in interpretation of single-case effect sizes is not to be embraced. Nevertheless, whatever the effect size method adopted, a particular effect size metric such as the Busk and Serlin (1992) method can be used as a *descriptive measure* of within-study assessment of an effect, but it may not be generalizable to other research areas.

No studies have examined the consistency of outcomes achieved by a single consultant across multiple cases. Studies stop short of indicating which consultants were responsible for which cases and outcomes. Instead, studies typically report (a) average outcomes achieved by multiple consultants pooled across all consultation cases, (b) separate outcomes for each case irrespective of the consultant, or (c) both. Group means obscure understanding of whether the size and consistency of effect sizes from different cases vary between or within consultants. If the variance is between consultants, then one can work backward identifying which variables

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