



Measuring intervention fidelity from different perspectives with multiple methods: The *Reflect* program as an example



Marie-Therese Schultes^{a,*}, Gregor Jöstl^a, Monika Finsterwald^b, Barbara Schober^a,
Christiane Spiel^a

^a University of Vienna, Faculty of Psychology, Department of Applied Psychology: Work, Education, Economy, Universitaetsstrasse 7, 1010 Vienna, Austria

^b Promente: kinder jugend familie, Unit for Evaluation and Quality Assurance, Villacher Strasse 161, 9020 Klagenfurt, Austria

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ABSTRACT

Implementing programs with high intervention fidelity generally increases program effectiveness. When evaluating intervention fidelity, collecting data from multiple informants and using different methods is likely to clarify different aspects of program outcomes. The present study investigated intervention fidelity in a gender competence program being implemented by 31 teachers in their classrooms. Intervention fidelity was assessed by expert ratings of the teachers' project portfolios and a survey of 564 participating students. Multilevel analyses showed that the two perspectives predicted different outcomes: the experts' ratings were linked to the students' gain in knowledge, while the students' ratings were linked to a change in their perception of a diversity-fair classroom environment. The results argue for a multi-perspective, multi-method approach when evaluating intervention fidelity.

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1. Introduction

When evaluating the effectiveness of programs in schools, more and more studies not only look at the programs' outcomes but also consider how the programs were implemented at the schools. An important component of the implementation process is the adherence to the theoretical core components of the program, also known as "intervention fidelity" (Darrow, 2013). The present study focuses on methods of integrating the concept of intervention fidelity into evaluation studies. More concretely, the study compares measures of intervention fidelity from different perspectives and relates these measures to the outcomes of a school-based intervention program.

Numerous studies have shown that since intervention fidelity is an important antecedent for a program's effectiveness, fidelity measures can explain variations in program outcomes (e.g., Burke, Oats, Ringle, Fichtner, & Delgado, 2011; Hirschstein, Edstrom, & Frey, 2007; Lillehoj, Griffin, & Spoth, 2004). Consequently, fidelity measures should be analyzed in relation to program outcomes. Yet,

Schoenwald and Garland (2013) showed in an extensive literature review that only 10.4 percent of 249 fidelity measures described in evaluation studies were analyzed together with program outcomes. Moreover, although fidelity measures from different perspectives are likely to lead to different results, the usage of multiple sources in fidelity assessment is rare (Lillehoj et al., 2004).

1.1. Evaluating intervention fidelity

An essential first step in evaluating intervention fidelity is the definition of the theoretical core components of a program (Fixsen, Blase, Naoom, & Wallace, 2009). The core components of a program can be defined as "the essential functions or principles, and associated elements and intervention activities (...) that are judged necessary to produce desired outcomes" (Blase & Fixsen, 2013, p. 3). By documenting the implementation of theoretical core components in the form of fidelity measures and connecting these measures with program outcomes, one can determine which theoretical components are essential for the effectiveness of a program. Accordingly, one can estimate which associated program activities have to be realized and which activities can be adapted without a loss of effectiveness (Odom, 2009).

Various factors can lead to deviation from a program's theoretical core components in practice (Dusenbury, Brannigan, Falco, & Hansen, 2003; Elliott & Mihalic, 2004; M. A. Little, Sussman, Sun, & Rohrbach, 2013). Possible reasons for these

* Corresponding author.

E-mail addresses: marie-therese.schultes@univie.ac.at (M.-T. Schultes), gregor.joestl@univie.ac.at (G. Jöstl), monika.finsterwald@promente-kijufa.at (M. Finsterwald), barbara.schober@univie.ac.at (B. Schober), christiane.spiel@univie.ac.at (C. Spiel).

deviations are manifold. Some of them may be traced back to program development, training of facilitators and implementation of a program. During program development, describing the theoretical core components in logic models is an important precondition not only for their documentation but also for their consideration when implementing a program in schools (Dimitrovich et al., 2008; Nelson, Cordray, Hulleman, Darrow, & Sommer, 2012). Then, the theoretical core components have to be communicated when training the facilitators (e.g., teachers in schools) who implement the program (Blase, Van Dyke, Fixsen, & Wallace Bailey, 2012). Finally, facilitators have to know strategies to implement the theoretical core components (Blase & Fixsen, 2013) and actually adhere to these strategies when implementing the program at practice sites (e.g., classrooms). This last step – which is highly dependent on the prior steps – can be represented by measures of intervention fidelity.

In essence, evaluations of intervention fidelity concentrate on the compliance of actions taken during program delivery with the theoretical background and contents of a program (Berkel, Mauricio, Schoenfelder, & Sandler, 2011). As this is highly specific for every program depending on its theoretical assumptions, a considerable challenge lies in the operationalization of intervention fidelity. Most previous studies have not followed a systematic approach, and there are considerable differences in operationalization between studies (Nelson et al., 2012; Schoenwald & Garland, 2013).

Accordingly, the procedures of operationalizing intervention fidelity are highly dependent on the particular program and its resources, as are the measurement methods. Several studies measure intervention fidelity by rating observational data of a program's implementation in the particular practice setting (Palinkas et al., 2011; Schoenwald & Garland, 2013). In this way, observers get a direct impression of the facilitators' interaction with program participants, e.g., a teacher's implementation of theoretical core components in the classroom. Disadvantages of the method are the fact that observations in the classroom require a great number of resources and that the presence of observers is likely to influence the teachers' and students' behavior (Nelson et al., 2012).

A measure that is not often used but also gives a good insight into facilitators' intervention fidelity at practice settings is the continuous documentation of the facilitators' program implementation in portfolios. The actions documented in these portfolios can then be rated by experts from the particular field concerning fidelity to the program's theoretical background. An advantage of this measure compared to observational measures is that the information covers the whole process, whereas observational studies mostly operate with selective data from particular program sessions (Schoenwald & Garland, 2013). In addition, the continuous keeping of records can be seen as a reminder for facilitators of the theoretical components they are to implement and as a guide for self-reflection on their own implementation strategies.

Another approach for requesting information about the entire process of program implementation is to conduct direct surveys with facilitators or participants (Mowbray, Holter, Teague, & Bybee, 2003). Concerning evaluations in schools, it is mostly the teachers who rate their own fidelity to a program's theoretical core components (e.g., Low, Van Ryzin, Brown, Smith, & Haggerty, 2014). A focus on the facilitators' perspective while leaving out the perspective of participants can be observed not only in most school-based programs but also in other contexts, such as health promotion (Schoenwald & Garland, 2013). Along with this approach go a risk of social desirability bias (Mowbray et al., 2003) and a lack of information on how the theoretical components were actually perceived by the ultimate target group. A possible way to address both these issues when evaluating

school-based programs is to survey students about their teachers' program implementation.

Taking all this into consideration, values for intervention fidelity will differ depending on the measure and the respondent (Ennett et al., 2011). Furthermore, fidelity measures deriving from different methods of data collection and from different informants are likely to relate to program outcomes in different ways. For example, by comparing facilitator and independent observer ratings of program implementation, Lillehoj et al. (2004) found out that only the observer ratings could predict program outcomes of a school-based prevention program. An explanation for this result provided by the authors was that due to a social desirability bias there was low variance in the facilitators' implementation ratings, which in turn limited the possibility of finding relations to program outcomes. In order to address these issues, the present study compares different perspectives on intervention fidelity using evaluation data from the school-based program *Reflect*, which is described in the following section.

1.2. The Reflect program

Reflect is a school-based program targeting gender competence for secondary school teachers and their students. Gender competence comprises the knowledge and skills of making both male and female students aware of the full range of their individual potentials without constraints through gender stereotypes. The program was developed at the University of Vienna as a result of international school monitoring studies (e.g., OECD, 2014) still reporting considerable gender differences in achievement and motivation. In this context, numerous studies show the crucial role of teachers' attitudes (especially their gender stereotypes) and teaching strategies (e.g., Heller, Finsterwald, & Ziegler, 2010; Keller, 2001).

The pilot phase of *Reflect* ran over one school year from September 2011 to June 2012. The main goals of the program were for students to (1) obtain knowledge about gender issues (e.g., gender stereotypes regarding occupational aptitudes) and (2) perceive their classroom as more diversity-fair (in terms of being accepted for one's individual qualities, e.g., regardless of gender). The program was conducted in two steps, an intensive phase and a supervision phase (both four months).

During the *intensive phase*, teachers were trained at the University of Vienna for two days each month, resulting in four modules. The first module comprised an input about stereotypes and their consequences in everyday life at school; the second module gave an overview on the current state of research on gender issues (e.g., effects of gender stereotypes); in the third module the role of motivational aspects for minimizing gender differences was highlighted; and in the fourth module concrete techniques for bringing these issues to teaching were embraced. In all modules self-reflection as well as practice activities preparing for the transfer of program contents into teaching were a central part. The latter included concrete strategies for imparting knowledge and handling diversity in the classroom, which were based on Ryan and Deci's self-determination theory (2000). The theory assumes that the fulfillment of three basic needs (autonomy, competence and social relatedness) in the classroom has a great positive impact on both achievement (goal 1) and class climate (goal 2; Deci & Ryan, 2002; Ryan & Deci, 2000).

In the *supervision phase*, which is the focus of this study, teachers were supported in systematically integrating the contents they had learned in the intensive phase into their teaching in the context of five-week projects in their classes. The projects were developed and implemented by the teachers themselves and dealt with the gender topic using the example of career decisions. Some of the teachers developed their projects in groups, though all

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