
Treatment Integrity in Interventions for Children Diagnosed with DSM-5 Disorders

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16.1 Introduction

Treatment integrity (also known as *treatment fidelity*, *procedural fidelity*, or *intervention integrity*) refers to the reliable and accurate implementation of an intervention. Treatment integrity (TI) is a term that refers to how the treatment which is actually administered is similar to the theoretical and procedural components of the intended treatment model (Dusenbury, Brannigan, Falco, & Hansen, 2003; Nezu & Nezu, 2008; Reed & Coddling, 2011). Failing to control for treatment integrity can result in several issues (Livanis, Benvenuto, Mertturk, & Hanthorn, 2013). First, if a treatment is not implemented with fidelity, clinicians cannot reliably evaluate the effects of the independent variable upon the dependent variable (Cooper, Heron, & Heward, 2007; Kazdin, 2011). In these instances, the intervention takes on multiple “lives”—one which exists on paper and one which is actually implemented—both of which may be similar to one another but are not exactly the same (Livanis & Mercer, [in press](#)). Second, there is the potential lack of improvement among clients. When interventions are implemented with higher rates of treatment integrity, there is a stronger association with positive treatment outcomes (DiGennaro, Martens, & Kleinman, 2007; DiGennaro, Martens, & McIntyre, 2005; Erhardt, Barnett, Lentz, Stollar, & Raifin, 1996; Hogue et al., 2008). When well-designed interventions are implemented correctly, there tends to be positive effects on clients.

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Lastly, interventions that are implemented without integrity can lead to related ethical and potential legal problems. Within the field of psychology, the push for evidence-based interventions (EBIs) has increased tremendously and a wide variety of governmental agencies and professional organizations have sought to define EBIs for children (Reichow & Volkmar, 2011). Failure to adhere to EBI, as in not implementing the intervention as intended, ceases to be an EBI. Various professional organizations address treatment integrity within their ethical codes or in collections of best practices for treatment implementation. The American Psychological Association's (APA) Policy Statement on Evidence-Based Practice in Psychology (APA, 2005) states to ensure the effectiveness and validity of intervention strategies, systematic review, and assessment is necessary; a lack of such evaluation would otherwise be viewed as unethical. The National Association of School Psychologists (NASP) Principles for Professional Ethics (2010a) states that, "school psychologists use assessment techniques and practices that the profession considers to be responsible, research-based practice" (p. 7). The NASP Model for Comprehensive and Integrated School Psychological Services (NASP, 2010b) urges school psychologists to use multisource data collection and assessment procedures to ensure effective implementation of EBIs.

Treatment integrity (TI) as a construct is not often effectively measured by clinicians or researchers (Dusenbury et al., 2003; McLeod, Southam-Gerow, & Weisz, 2009). To be fair, it is only recently that there has been some recognition of TI as an important construct that has implication on the nature of psychological therapy (Sanetti & Kratochwill, 2014). In some instances, it appears that practitioners have difficulties accessing the body of work that is based on treatment integrity (McIntyre, Gresham, DiGennaro, & Reed, 2007), but others have suggested that the measurement of treatment integrity might present as a greater challenge than the actual implementation of the intervention (Foxx, 1996).

Only 18% of the studies of interventions for children actually assessed and reported treatment integrity data (Wheeler, Baggett, Fox, & Blevins, 2006), while Cochrane and Laux (2008) found that only 1–2% of practicing school psychologists regularly measured rates of treatment integrity. This is a problem for clinicians because the treatments that are researched in the literature often fail to demonstrate that they were consistently implemented and calls into question whether these research-based interventions can be translated into practice (Allen & Warzak, 2000).

16.2 Dimensions of Treatment Integrity

TI is traditionally conceived as a multidimensional construct that comprises three dimensions or components (McLeod et al., 2009; Perepletchikova & Kazdin, 2005): treatment adherence, implementer competence, and treatment differentiation.

16.2.1 Treatment Adherence

Adherence refers to the clinician's implementation of procedures in a stable manner over time, which can improve with consistent contact with others with whom they can discuss the treatment application process. When treatment implementers are exposed to some form of consistent and ongoing training or supervision regarding the treatment, TI has been shown to improve dramatically and ultimately provides positive outcomes for the clients. For instance, it was found that weekly supervision to therapists increased fidelity to the manualized treatment protocols, which in turn led to significant decreases in problem behaviors in an outpatient setting (Hogue et al., 2008). It was also found that implementation of biweekly direct observations and immediate feedback increases the level of integrity to the treatment plan in a school setting (Coddling, Feinberg, Dunn, & Pace, 2005).

A consideration of treatment adherence must take into consideration the setting of the intervention as well as the population served. Treatment protocols must be flexible to meet the needs of the client in various real-life settings: schools, clinics, hospitals, and offices. Some interventions, especially those that target psychopathological conditions in children actually require creative implementations of established interventions; in these conditions, therapist creativity can be considered a component of treatment adherence (Perepletchikova, 2014). In those cases, the treatment protocol or manual could specify which components of the treatments as well as the parameters of creativity that the therapist may apply. In other cases, more extreme psychiatric disorders may require the implementation of the same treatment protocol with increased magnitude or intensity (Dusenbury et al., 2003; Schulte, Easton, & Parker, 2009). In all of these instances, the "personalization" of the intervention should be overtly specified within the protocol to provide additional supervision on how to adhere the various components of the intervention (Barber et al., 2006; Perepletchikova & Kazdin, 2005).

16.2.2 Implementer Competence

Implementer competence refers to the experience, knowledge, and/or skill of the individuals that is implementing the treatment (Perepletchikova & Kazdin, 2005). The individual's competence could potentially be an important factor depending on the complexity of the intervention. Agent competence can be a combination of preservice and ongoing training and supervision. Some clinicians may not have received preservice training that prepared them for the implementation of a specific treatment protocol, or for specific components of an intervention, which would require additional in-service training. Corrective feedback, which is the observation of an implementer coupled with feedback, has been shown to be an effective and time-efficient method for in-service training opportunity to many implementers (Coddling et al., 2005; Coddling, Livanis, Pace, & Vaca, 2008; DiGennaro et al., 2005, 2007; DiGennaro-Reed, Coddling, Catania, & MaGuire, 2010; Mortensen & Witt, 1998; Mouzakitis, 2010; Noell, Witt, Gilbertson, Ranier, & Freeland, 1997), thus improving implementer competence.

Competence also varies as a function of the level of communication between the treatment designers and implementers (Cowan & Sheridan, 2003). In many instances, especially when working with children, people other than the therapist may be called upon to deliver services. For example, parent implementation of key behavior procedures is a key component of treatment for children diagnosed with Attention Deficit Hyperactivity Disorder (Kazdin, 2015), and can greatly enhance and support the treatment of children diagnosed with developmental disorders as well (Skotarczak & Lee, 2015). Parent-based interventions are usually created or managed by the therapists, and training needs to factor in the use of psychological jargon, and use more practical and common sense terms to describe or define the intervention plan (Elliot, 1988; Witt, Moe, Gutkin, & Andrews, 1984).

16.2.3 Treatment Differentiation

Treatment differentiation refers to the extent that the treatment, intervention, or program that is implemented is “pure” and other treatments are not implemented in addition to or instead of the intervention (Perepletchikova & Kazdin, 2005). Differentiation is particularly important when two or more treatment programs are compared to one another in the research literature. Specifically, treatment protocols must be reliably distinguished from one another in order to ensure that potential differences in the dependent variable can be attributed to differences in the independent variable (Kazdin, 1986). Treatment differentiation can be effectively dealt with if operational definitions of the treatment has been well established. One must be cognizant of *therapist drift*, where implementers modify the treatment plan in minor ways over periods of time, which produces a significant shift in the independent variable over time, which can over- or underestimate treatment effects. Therapist drift is typically not intended but can happen due to decreased diligence, supervision, or boredom.

16.3 Associated Variables

There are factors that have been associated with difficulties in the maintenance of TI. The complexity of a treatment has been found to impact TI (Meichenbaum & Turk, 1987), and it is usually operationalized as the number of components or parts of an intervention. In general, more complex interventions are evaluated more negatively by potential treatment implementers (Yeaton & Sechrest, 1981) and are not implemented with integrity. Complexity may play a role when practitioners implement interventions across various settings (e.g., home, school, clinic) and with multiple implementers (e.g., parents, teacher, clinicians). Communication among all implementers is a critical dimension of complexity as is the varying degree of experience among the implementers (Gresham, 1996). For example, parents may experience certain procedures or components of interventions as difficult to manage over period of time in the home, which may cause them to stray away from the originally stated procedure (Allen & Warzak, 2000; Kazdin, 2015). This may be particularly evident when interventions target externalizing difficulties, such as

explosive behaviors (Greene, 2001; Greene & Albon, 2006). In-service training could be provided to implementers who are not effectively trained. Usually these trainings involve a great deal of didactic instruction, which assumes that parents will develop adequate rules for program implementation based solely on instruction and follow them perfectly. However, this is an unrealistic assumption (Hayes & Wilson, 1993). It is for this reason that a fair amount of training programs for parents (and all treatment implementers) should include modelling, role-play, and rehearsal, both before they begin to implement the intervention and after the intervention has been in place for a while.

Time spent in the delivery of the intervention by treatment implementers may serve to obstruct treatment integrity. Interventions that are easy to learn tend to show better rates of TI (Gresham, 1996). Some interventions require ongoing supervision to maintain at effective levels, while some treatments need extended periods of administration (typically referred to as *dosage*) until an effect is witnessed, typically due to the severity of the targeted issues that are addressed (Happe, 1982). Interventions that require a great deal of materials or present major expenses to implementers (in time or finances) can also negatively impact treatment integrity (Gresham, 1996; Perepletchikova & Kazdin, 2005).

16.4 Measuring Treatment Integrity

16.4.1 Operational Definition of the Treatment and its Components

Psychological interventions for children are complex and include multiple components (Domitorvich et al., 2008). Therefore it will be often necessary for the practitioner to define her intervention vis-a-vis its components in order to ensure treatment integrity. A good operational definition should be clear and parsimonious and should include, when possible, exclusionary and inclusionary criteria (Cooper et al., 2007).

Ideally, an operational definition of a component should include four dimensions: verbal (descriptions of scripts to be presented at various times), physical (descriptions of what actions should be performed), spatial (the positioning of materials such as furniture and papers), and temporal (which actions should follow which environmental events in the program sequence). Referencing these four dimensions allows for an easy replication of the intervention, both in applied settings and in research studies. However, treatment integrity could potentially be affected by over-specifying treatments and its individual components as a treatment can be made to appear overly complex (Gresham, 1996).

16.4.2 Direct Assessment of Treatment Integrity

The direct assessment of TI is conducted in a similar fashion to traditional behavioral assessment—the presence or the absence of the operational definition documented over a period of time (Cooper et al., 2007), and often a final percentage is

calculated to indicate how much integrity to the treatment the agent(s) has exhibited. Direct assessments can be conducted at the point of intervention (i.e., during the implementation of the treatment), at a later time possibly through video (Perepletchikova & Kazdin, 2005), or possibly via internet-based technologies.

The reliability of direct assessments of TI improves dramatically when multiple observations are conducted in single-case experiments (Kazdin, 2011). The literature generally suggests the need for multiple observational periods of sufficient length; however, there are debates as to the number and time frame of observations. Gresham (1996) suggests 20–30 min of three to five observational sessions. Leblanc, Ricciardi, and Luiselli (2005) and DiGennaro-Reed et al. (2010) observed treatment implementers for 10–15 min but Codding et al. (2005) observed treatment implementers for 55–60 min. There is also variability in the number of observations that are conducted as well, ranging from 3 sessions to 12 sessions (Codding et al., 2008; LeBlanc, Ricciardi, & Luiselli, 2005). Since most of these studies were conducted in non-laboratory settings, the variability was oftentimes a function of the conditions of the setting that the therapy was conducted. In controlled settings, the number of observation periods as well as the length of the average observation period seems to decrease, which may possibly be due to issues of increased agent competence as well as a heightened awareness and focus on treatment adherence (DiGennaro-Reed et al., 2010; LeBlanc et al., 2005).

An important consideration when TI is directly observed is that of observer reactivity, or the tendency for implementers to modify their behavior if they are aware that they are the subject of observation (Cooper et al., 2007; Foster & Cone, 1986; Gresham, 2014). However, there is some evidence to suggest that reactivity to the observer tends to dissipate as a function of time (Codding et al., 2008).

Most studies of TI focus on the assessment of treatment adherence (i.e., the implementation of the treatment as designed). Perepletchikova and Kazdin (2005) stress the importance of two other dimensions of treatment integrity that need to be assessed: agent competence and treatment differentiation. Measures of agent competence should assess the quality of the delivery, which include client or consumer comprehension of the purposes, goals, and procedures of the treatment, and the level of concordance between training and agent activities (Jones, Clark, & Power, 2008). Perepletchikova (2014) however warns that attempting to include client or consumer comprehension and/or appreciation may veer the assessment to include outcomes or possibly even measures of social validity (Cooper et al., 2007). Measures of treatment differentiation should focus on an assessment of procedures that are not prescribed, that are delivered in addition to or instead of the prescribed intervention (Perepletchikova & Kazdin, 2005).

16.4.3 Indirect Assessment of Treatment Integrity

Several authors have cautioned against the use of indirect assessments of TI, noting that at best, they can only supplement direct methods of assessment (Bergan & Kratochwill, 1990; Gresham, 1989). Indirect methods can include implementers'

self-reports, an evaluation of permanent products which result from the treatment (e.g., client homework or worksheets jointly completed in therapy), rating scales, and self-monitoring (Perepletchikova & Kazdin, 2005). Self-monitoring has been found to be an effective assessment tool, as well as a method to help increase and improve treatment integrity (Burgio et al., 1990; Coyle & Cole, 2004; Petscher & Bailey, 2006; Richman, Riordan, Reiss, Piles, & Bailey, 1988). However, self-monitoring can be a laborious method of collecting data on TI—it requires that the agent stop the intervention, rate their own behavior, and then continue with the intervention. It may be extremely difficult to implement this moment-to-moment self-monitoring, even when interventions are being delivered in a 1:1 fashion (Gresham, 1996). Because of these concerns, it is possible that self-monitoring methods are not the most effective methods to collect data on adherence (Coyle & Cole, 2004; McLeod et al., 2009; Richman et al., 1988). There have been several recommendations suggested to make this process easier, specifically the addition of prompts (Petscher & Bailey, 2006) or visual representations of data (Burgio et al., 1990) to assess adherence.

Self-monitoring data create implementer awareness to of their own behaviors for better understanding and how it relates to treatment integrity; however, this avenue of research has not been extensively researched as of yet. Self-monitoring assessments and resulting data should be evaluated with caution due to a subtle demand characteristic that pulls for social approval and may cause treatment implementers to overreport treatment integrity (Perepletchikova & Kazdin, 2005).

16.4.4 Interpretation of Treatment Integrity Data

Measurements of treatment integrity are quantitative methods that identify how therapist drift affects the dependent variable (Gresham, 1996). Therapist drift, or low levels of treatment integrity, often calls into question whether or not the independent variable effected changes onto the dependent variable. Table 16.1 highlights some of the interpretative issues that can arise from differing levels of treatment integrity. Where there are high levels of TI, decisions regarding the effectiveness and efficacy of treatment can be made with the confidence that the treatment conditions that were specified were followed.

However, where there are conditions of low levels of TI (or none), the drift may actually serve to artificially improve outcomes, thus creating Type I error, a situation where the intervention is incorrectly deemed to be effective. To a large degree, most therapeutic interventions conducted with children or adults are the results of Type I errors: the therapist and the client may “feel good” about the “work” they have conducted, but in reality, there is no long-term benefit to the client.

Furthermore, low levels of treatment integrity in relation to no changes or undesired changes in the client could cause practitioners to conclude that the therapeutic intervention was not effective. While the authors agree that ineffective treatment procedures should clearly be suspended, in this instance, it is not clear whether the lack of client change was the function of an inappropriate intervention or an

Table 16.1 Interpretative issues that can arise from effects of varying levels of treatment integrity on the dependent variable

	Levels of integrity	
	<i>High</i>	<i>Low or none</i>
Outcome		
Desired direction	Confidence that the treatment package has an effect	No confidence that the treatment package has any effect Increased risk of making a Type I error (<i>False Positive</i>) if treatment integrity data are not collected
No change	Confidence that the treatment package has no effect	No confidence that the treatment package has any effect Increased risk of making a Type II error (<i>False Negative</i>) if treatment integrity data are not collected
Undesired direction	Confidence that the treatment package has no effect and may even be potentially harmful	No confidence that the treatment package has any effect Increased risk of making a Type II error (<i>False Negative</i>) if treatment integrity data are not collected

inappropriately applied intervention. This is considered to be a Type II error, in which the therapist rejects an intervention that might actually be effective. A lack of TI in these conditions would hinder the identification of potentially effective treatments.

16.5 Methods to Increase Treatment Integrity

Performance feedback (PFB) is the most common reported method to increase TI (Coddington et al., 2005, 2008; DiGennaro et al., 2005, 2007; DiGennaro-Reed et al., 2010; Mortensen & Witt, 1998; Mouzakitis, 2010; Noell et al., 1997). Performance feedback typically consists of a systematic method of delivering feedback to treatment implementers regarding their treatment adherence. Typically, this process includes a structured observation by someone other than the treatment implementer followed by a meeting (or some other means of communication) between the observer and the implementer where feedback regarding adherence is shared. A typical PFB observation session can last anywhere between 5 and 20 min (Reed & Coddington, 2011), with initial PFB sessions lasting much longer than later sessions. Praise is typically delivered as a function of the amount of correctly implemented components, as well as aspects of a plan that were not followed or implemented correctly. Furthermore, training methods can be employed during PFB to ensure correct component implementation in the future.

PFB as a method can be used to address some of the threats to PFB. Specifically, the fluency or automaticity of treatment skills can be addressed with PFB. In other instances, the implementer may have forgotten components of the treatment which

are important. PFB addresses these threats via the use of review, modelling, rehearsal, and role-play, if necessary.

While PFB has been demonstrated to increase TI, variations of the procedure have been examined in the literature. For example, Guercio et al. (2005) varied PFB private meetings with public postings of treatment integrity to train 30 staff members at a residential facility. Although the results of the study showed dramatic increases of integrity among all staff, it is unclear whether the private or public PFB was more successful. The delivery of PFB and the amount of time between the observation periods have also been investigated. Noell et al. (1997) delivered PFB immediately after observation, while Coddling et al. (2005) delivered PFB every other week and others have examined varying lengths of time in between. PFB appears to work despite time delays, but ultimately more intense and steeper increases in treatment integrity were associated with shorter time lapses (Mortensen & Witt, 1998).

While PFB has been demonstrated to be effective method to increase treatment integrity, the removal of PFB demonstrates decreases in levels of treatment integrity (Noell et al., 1997; Witt, Noell, LaFleur, & Mortenson, 1997). The process of fading is recommended to work around this issue (DiGennaro et al., 2005; Noell et al., 2000; Reed & Coddling, 2011). Fading refers to the gradual decrease in how often and how long PFB is delivered that is contingent upon the demonstration of treatment integrity at specified criterion levels. For example, if a treatment implementer received PFB once a day and she demonstrates TI rates of 90% or better for three consecutive observation sessions, then the schedule might be *thinned* to once every other day.

There has been a fair amount of interest into conceptual systems that underlie the process of PFB (Noell & Gansle, 2014). An analysis of conceptual systems involves an evaluation of which principles underlie change processes when PFB is used effectively (Baer, Wolf, & Risley, 1968; Cooper et al., 2007). Ultimately, PFB may operate on different principles depending on contextual variables as well as observer and implementer characteristics. In many instances, the delivery of PFB may be experienced as a positive reinforcer (as it increases appropriate behaviors upon delivery; Coddling et al., 2008). However, it is not so far-fetched to consider certain work conditions might make the delivery of PFB an aversive condition where treatment adherence behaviors are performed to remove the presence of the observer (DiGennaro et al., 2005). These discrepant experiences of PFB could be due to the setting (e.g., an inner city private school vs. a suburban mental health clinic), the person delivering PFB (e.g., a relaxed university faculty member vs. strict clinic supervisor), how PFB is used by the setting (e.g., as a teaching tool or as a way to evaluate staff dismissal), and perhaps even idiosyncratic characteristics of the individual delivering PFB.

Lastly, self-monitoring procedures have also been investigated to improve treatment integrity. Self-monitoring procedures would be enticing because it would decrease the reliance on other individuals observing and intervening with treatment implementers, thus saving time for staff and resources for the agency as a whole. Self-monitoring as an intervention to improve treatment integrity shows some good

results (Coyle & Cole, 2004; Richman et al., 1988) and more rapid increases when paired with environmental prompts (Burgio et al., 1990; Petscher & Bailey, 2006); however, overall, these results do not approach the speed and total amount of improvement in treatment integrity that the PFB procedure offers.

16.6 Conclusion

The failure to engage in a process to consider evidence-based interventions can severely compromise the implementation of evidence-based interventions. A treatment designer must take time to evaluate if the intervention was implemented as was suggested in the literature so that she may rationally consider changes to treatment plans. Naturally, provisions are made with every intervention regarding the amount and quality of deviation that individual practitioners can apply, but core aspects of the intervention must be applied as was described initially in order to critically examine what should or should not be altered.

Such efforts impact not only the remediation or rehabilitation of psychological distress in clients, but also is a matter of public trust. If procedures are easily accessed through books or websites, and the psychological community fails to implement them correctly (and fails to show improvements in psychological functioning), then the public will lose their trust in our ability to effect positive change in behavioral and mental health outcomes.

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