Article

Simulation modeling analysis of sequential relations among therapeutic alliance, symptoms, and adherence to child-centered play therapy between a child with autism spectrum disorder and two therapists

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Abstract

This study examined the sequential relations among three pertinent variables in child psychotherapy: therapeutic alliance (TA) (including ruptures and repairs), autism symptoms, and adherence to child-centered play therapy (CCPT) process. A 2-year CCPT of a 6-year-old Caucasian boy diagnosed with autism spectrum disorder was conducted weekly with two doctoral-student therapists, working consecutively for 1 year each, in a university-based community mental-health clinic. Sessions were video-recorded and coded using the Child Psychotherapy Process Q-Set (CPQ), a measure of the TA, and an autism symptom measure. Sequential relations among these variables were examined using simulation modeling analysis (SMA). In Therapist 1's treatment, unexpectedly, autism symptoms decreased three sessions after a rupture occurred in the therapeutic dyad. In Therapist 2's treatment, adherence to CCPT process increased 2 weeks after a repair occurred in the therapeutic dyad. The TA decreased 1 week after autism symptoms increased. Finally, adherence to CCPT process decreased 1 week after autism symptoms increased. The authors concluded that (1) sequential relations differ by therapist even though the child remains constant, (2) therapeutic ruptures can have an unexpected effect on autism symptoms, and (3) changes in autism symptoms can precede as well as follow changes in process variables.

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Autism spectrum disorder (ASD) is a widely researched psychiatric disorder often diagnosed as early as 18 months (Filipek et al., 2000; Landa, Holman, & Garrett-Mayer, 2007). High-functioning ASD (HFASD), formerly known as Asperger's disorder, is usually diagnosed in the preschool years (Khouzam, El-Gabalawi, Pirwani, & Priest, 2004). Kestenbaum (2008) characterized patients with this disorder as having "intact cognitive and verbal abilities but who demonstrated a severity of social interaction, a failure of communication and an intense absorption in certain subjects" (p. 280). Symptoms of HFASD include severe and sustained impairment in social interaction, restricted or repetitive behavior and interests, deficient ability to engage in age-appropriate adaptive behavior, and limited interest in the environment. Children diagnosed with HFASD also lack socioemotional reciprocity and difficulty interpreting others' emotional states (American Psychiatric Association (APA), 2013; Rinehart, Bradshaw, Brereton, & Tonge, 2002). Unlike ASD, however, HFASD occurs without the presence of clinically significant cognitive and language deficits. The HFASD child's social deficits compromise his or her ability to develop typical relationships (Khouzam et al., 2004). In spite of the knowledge base researchers have developed for ASD and HFASD, surprisingly little is known about which treatment models work for these children or how effective treatment models work.

Due to the limitations of randomized controlled trials (Duncan, 2002; Goodman, 2010; Westen, Novotny, & Thompson-Brenner, 2004), some psychotherapy researchers are turning to single-case designs to explore questions of the treatment process and its effectiveness (Iwakabe & Gazzola, 2009). Psychotherapy researchers use such designs to explore which interventions work for individual patients at the level of a single case in the hope that these single cases can be gradually aggregated to enhance practice-based knowledge (Ablon & Jones, 1999, 2005; Iwakabe & Gazzola, 2009; Jones, 1993, 2000; Jones, Ghannam, Nigg, & Dyer, 1993).

With single-case studies, clinical theory can be developed from the ground up; conditions under which direction of causality differs can be clearly demarcated. In the current study, we explore whether therapeutic alliance (TA) precedes symptom improvement or vice versa in a child diagnosed with HFASD. The results might differ from another child diagnosed differently or at a different developmental stage.

TA and treatment outcome in children

One set of change processes widely studied in the adult psychotherapy literature is the temporal relation between TA and treatment outcome. TA refers to "the quality and nature of the interaction between the patient and therapist" (Kazdin, Marciano, & Whitley, 2005, p. 726). In fact, the TA is the most researched aspect in the adult psychotherapy literature (Zack, Castonguay, & Boswell, 2007). The correlation between TA and treatment outcome is moderate, $r = .26$ (Crits-Cristoph, Barber, & Kurcias, 1993), which suggests that TA is an important common factor across a variety of treatment models and diagnostic categories. This correlation, however, does not indicate whether TA causes symptom reduction or vice versa. Recent evidence suggests that TA predicts symptom reduction but not vice versa (Zilcha-Mano, Dinger, McCarthy, & Barber, 2014; Zilcha-Mano, Roose, Barber, & Rutherford, 2015; Zilcha-Mano, Solomonov, et al., 2015). The question is whether this direction of causality also holds for young children with HFASD, or whether, due to psychiatric diagnosis or developmental stage, the directionality is reversed.

One line of inquiry garnering increasing interest among TA researchers is the study of ruptures and repairs in the therapeutic relationship. A rupture is a disagreement or break in the collaborative component of the TA. After a rupture occurs, repair can strengthen the TA (Mitchell, Eubanks-Carter, Muran, & Safran, 2010; Smith, Msetfi, & Golding, 2010). Whereas rupture weakens the TA, repair strengthens it. Repair is marked by a renewed collaboration

between the therapist and patient. A repair cannot take place without a rupture first occurring; however, the repair does not necessarily immediately follow the rupture. No specific timeframe exists for when the repair will occur post-rupture; an entire session or multiple sessions might transpire before a repair occurs, or a rupture might occur without a subsequent repair (Eubanks-Carter, Mitchell, Safran, & Muran, 2009). Markers of repair include (1) communication of what the patient desires or does not desire from the therapist in an appropriate manner and (2) expression of vulnerability by the patient to the therapist (Mitchell et al., 2010). One meta-analysis suggested that the rupture/repair process predicts treatment outcome in adult patients (Safran, Muran, & Eubanks-Carter, 2011); however, the rupture/repair process has never been studied in children diagnosed with HFASD.

Treatment adherence and treatment outcome in children

Researchers have studied whether the therapist's adherence to a particular treatment model as articulated by a treatment manual might be correlated—positively or negatively—with treatment outcomes. Contrary to expectations that increased adherence would be positively correlated with more successful treatment outcomes, some researchers (Castonguay, Goldfried, Wiser, Raue, & Hayes, 1996) have demonstrated that adherence to cognitive therapy for depression is inversely proportional to treatment outcome: the therapists attempted to correct problems in the TA by increasing treatment adherence, further straining the TA and thereby dooming the outcome. Treatment adherence has been studied in children diagnosed with HFASD (Goodman & Athey-Lloyd, 2011; Goodman, Reed, & Athey-Lloyd, 2015), but no studies have explored the relation between treatment adherence and treatment outcome in this population. It is not known whether such findings would reflect those in the adult literature.

Simulation modeling analysis to determine process change in a single case with two therapists

Time-series analysis is a popular method of analyzing single-case research data. Researchers use this method to assess the sequence of changes between two variables (e.g. TA and symptom levels). The outcome variable can be measured at the time of session or as frequently as daily. More sophisticated time-series analyses include strategies for treating autocorrelation; each subsequent observation is dependent on prior observations because the data source remains the same person. Conventional time-series analyses treat autocorrelation essentially as error to be modeled away rather than as grist for the therapeutic mill (see Borckardt et al., 2008; Gottman & Ringland, 1981; Price & Jones, 1998). In contrast, simulation modeling analysis (SMA) treats autocorrelation as interesting data in and of itself. SMA generally resamples from known distributions to determine exact probabilities rather than probability estimates.

In the present study, SMA was applied to the treatment of a boy diagnosed with HFASD. A measure of autism symptoms (Childhood Autism Rating Scale, Second Edition–High Functioning Version (CARS2-HF)) was completed for each session and served as the treatment outcome variable.

The present study used SMA to determine how symptoms of HFASD, manifested in session, are related to the TA, the rupture/repair process, and treatment adherence. Specifically, consistent with the adult psychotherapy literature, we hypothesized that changes in the TA, rupture/repair process, and treatment adherence would precede changes in symptom levels across sessions. We also hypothesized that changes in treatment adherence would precede changes in the TA. We compared these change processes between two therapists working consecutively with one child across a

2-year time span because it afforded us the opportunity of conducting two single-case studies with the same patient.

Method

Patient

The child, S., began therapy as a 6-year-old in the first grade. He received a diagnosis of Asperger's disorder (APA, 2000) at this age from his first therapist and her clinical supervisor. He would have satisfied the criteria for HFASD (APA, 2013). S. lived with his biological parents and a typically developing biological brother 2 years younger. Both parents were upper-middle-income professionals who appeared to love each other and their two sons. S. presented with behavioral and social difficulties. Behavioral difficulties included difficulty following directions and routines at school, while social difficulties included failure to initiate contact or sustain interactions with peers. S. also manifested perseverative interests in certain television shows and films (i.e. endlessly repetitive views of a particular children's cartoon). He had a history of developmental delay in several areas, including speech and gross-motor coordination. In spite of these delays, he appeared to be a highly intelligent child, capable of symbolic thinking. He engaged spontaneously in nondirective fantasy play, although often in connection with themes or characters from his perseverative interests. Although diagnosed with HFASD, S. was deemed suitable for child-centered play therapy (CCPT). He participated in weekly 45-minute sessions across a 2-year time span. S.'s assent and his parents' signed informed consent were obtained before videotaping his sessions.

Therapists

This study took place in a university-based community mental-health clinic. Both therapists who took part in this study were second-year clinical psychology doctoral students enrolled in the same doctoral program and participating in weekly CCPT supervision conducted by the same experienced child clinical psychologist. Therapist 1, who treated the child during the first year, was female. Therapist 2, who treated the child during the second year, was male. Both were from European-American backgrounds. The same experienced child clinical psychologist (also European American) supervised both student therapists. Both therapists also consented for the videos of their treatments to be viewed and coded for the present study.

Treatment

Annually rotating clinical psychology doctoral students work under close supervision at this low-cost, university-based community mental-health clinic located in a suburb of New York City. The treatments under study were conducted in the clinic playroom, which is stocked with a large number of toys suitable for CCPT.

Measures

Segmented Working Alliance Inventory–Observer Form. The therapeutic or working alliance refers to the "quality and nature of the interaction between the patient and therapist" (Kazdin et al., 2005, p. 726). The term also refers to the collaboration between therapist and patient across the components of a goal, task, and bond. The Segmented Working Alliance Inventory–Observer Form (S-WAI-O; Berk, Eubanks-Carter, Muran, & Safran, 2010) was used to assess the quality of the TA (only task

and bond) in a given session in 5-minute increments or segments. Adapted from the Working Alliance Inventory–Observer Form (WAI-O; Darchuk et al., 2000), the S-WAI-O comprises six task-related and six bond-related items. Items are coded on a 7-point Likert-type scale (1 = "very strong evidence against"; 4 = "no evidence or equal evidence"; 7 = very strong evidence for"). Each 5-minute segment is assigned a score ranging from 12 to 84, while segment scores are averaged across each session to produce one TA score per session.

A rupture is a disagreement or break in the collaborative component of the TA in a task or bond. After a rupture occurs in the TA, repair serves to re-strengthen the alliance (Mitchell et al., 2010). A repair of the TA is marked by a renewed collaboration between therapist and patient. Repair cannot occur without a rupture first occurring; however, the rupture does not necessarily immediately precede the repair. The frequency of ruptures within a given session between the patient, S., and his therapists, as well as across sessions, was measured using the Rupture Resolution Rating System (3RS) in conjunction with the S-WAI-O (Eubanks-Carter et al., 2009). Fischel (2012) found that TA as measured by the S-WAI-O was negatively correlated with therapist interpretations identifying the child's unwanted feelings and associated defenses in a single-case study of a 6-year-old boy diagnosed with Asperger's disorder.

Ruptures and repairs are coded by plotting the mean TA score for each session as a horizontal line above the X-axis, which is divided into segment numbers (typically 1–9 in a 45-min session). Individual TA segment scores are then plotted along the Y-axis, which represents the magnitude of the TA (ranging from 12 to 84). Thus, a score of 32 in Segment 5 would be plotted with the X-coordinate of 5 and a Y-coordinate of 32. Ruptures were present when a data point fell at or below two standard deviations from the TA mean for that session, or there were three consecutive data points below the session mean. A repair was present when a data point that fell at or below two standard deviations from the session mean returned to above two standard deviations below the session mean. When a rupture occurred that consisted of three consecutive data points below the session mean, a repair was present when the data point following the rupture returned above the session mean. Ruptures and repairs were summed separately for each session. Thus, each session was assigned a ruptures total score and a repairs total score. In a session with nine segments, the total score for each variable could range from 0 to 9.

The Child Psychotherapy Process Q-Set. The Child Psychotherapy Process Q-Set (CPQ) is a new and recently validated measure, adapted for use with children from the adult-focused Psychotherapy Process Q-Set (PQS; Jones, 2000). The 100 items were gleaned from a review of the child psychotherapy literature across theoretical orientations. A series of progressive pilot studies guided the reformulation of the items until the measure was validated successfully for 3- to 13-year-old children of diverse symptomatology, ethnicity, and socioeconomic status. Expert therapists carefully rated all 100 items according to their perceived face validity and relevance to child therapy. Pilot testing verified the measure's clinical validity, item validity, and discriminant validity (Schneider, 2004). Coders, regardless of theoretical orientation, reached consistent interrater reliability (ranging from intraclass correlation (ICC) = .55–.89) on child therapy session videotapes (Goodman, 2015; Goodman & Athey-Lloyd, 2011; Schneider, 2004).

As with the PQS, the CPQ captures three domains of therapeutic process: therapist attitudes, behavior, feelings, and experience; child attitudes, behavior, feelings, and experience; and the nature or climate of the dyadic interaction. After watching a videotape of a 45-minute session, raters sort the 100 items into nine piles in a forced-choice (ipsative) procedure ranging from most uncharacteristic (Pile 1) to most characteristic (Pile 9). The ipsative procedure used in Q-sort methodology forces raters to place items in a normal distribution that characterizes both high and low ends of a construct, with the majority of items placed centrally and increasingly fewer items placed toward each extreme.

Outcome research has typically focused on a comparison of "brand-name" therapies (Shirk & Russell, 1996); however, process research seeks to understand qualitatively which essential ingredients compose these brand names. In this study, we used the CPQ to calculate session adherence to a previously established CCPT prototype composited from the prototypical CPQ ratings of 24 play therapy (PT) experts (Goodman et al., 2015). Cronbach's alpha coefficients used to test the level of agreement on what constitutes a prototypical psychotherapy session among the therapist raters of CCPT process was high: $\alpha = .96$ for the 24 PT experts.

Childhood Autism Rating Scale. The CARS2-HF (Schopler, van Bourgondien, Wellman, & Love, 2010) is an updated version of the Childhood Autism Rating Scale (CARS; Schopler, Reichler, & Renner, 1988). The CARS2-HF includes 15 identified target behaviors, which were derived from a sample of over 3600 children from both clinical and nonclinical settings. The target behaviors are rated on a 4-point rating scale. Coders may rate a target behavior between two anchor points (e.g. 1.5), allowing for seven possible scores within each of the 15 domains. Ratings are based on the frequency, intensity, duration, and typicality of the target behaviors during the observation. Scores are summed to produce a total score ranging from a minimum of 15 to a maximum of 60, indicating the severity of the autism spectrum symptoms. A study using the CARS2-HF reported an interrater reliability of .96 and internal consistency reliability of .96 (Schopler et al., 2010).

Procedure

This study was approved by an Institutional Review Board. Consent and assent were obtained from both parents, the child, and both therapists. Additionally, each coding team member signed a confidentiality agreement.

Four teams of two graduate students coded the 53 videotaped sessions using the S-WAI-O. Three teams of two graduate students (some of whom belonged to the previous four teams of coders) coded the CARS2-HF. Four teams of two graduate students (none of whom belonged to the previous seven teams of coders) coded the CPQ. All coders were blind to the study hypotheses and to the child's diagnosis. Coders coded the sessions independently of each other in random order. Using ICCs, the four S-WAI-O coding teams established a mean interrater reliability of $r = .87$. The three CARS2-HF coding teams established a mean interrater reliability of $r = .75$. The four CPQ coding teams established a mean interrater reliability of $r = .77$. For each of these three measures, a composite score for each team was derived by averaging the two coders' scores. These composite scores were then used in the data analyses.

Data analysis

SMA. In the present study, we used SMA to determine the significance of cross-correlations across variables. The SMA program was developed to provide a free and reliable method of analyzing relatively short streams (i.e. less than 30 data points) for auto-correlated time-series data. The SMA program (version 9.9.28) is available for download at http://www.clinicalresearcher.org/software. htm (Borckardt et al., 2008). The SMA program for cross-lagged correlations populates the values for Variables 1 and 2 with the number of data points in each corresponding column of the dataset. In the present study, a lag of 1 represents 1 week in time. If the Bonferroni-corrected significance is checked, the alpha value will be equal to the preset alpha (default = .05) divided by the number of lags investigated plus 1 (i.e. for lag = 0). For example, if we test seven hypotheses (from −3 to 3 lags) with a preset alpha = .05, then the Bonferroni correction would test each individual hypothesis alpha = .05/7 = .007.

The sign of lag represents whether the changes in Variable 1 precede or follow Variable 2. For example, if a significant cross-correlation is found between Variables 1 and 2 at any *positive lag* (e.g. lag + 1), then changes in Variable 1 precede changes in Variable 2. On the contrary, if a significant cross-correlation lag is found between Variables 1 and 2 at any *negative lag* (e.g. lag − 1), then changes in Variable 1 follow changes in Variable 2. Note that the sign of the *lag* indicates whether the changes in Variable 1 precede changes in Variable 2. Moreover, the sign of the *cross-correlation* indicates a direction of change between Variables 1 and 2. More specifically, if the sign of the cross-correlation is positive, then changes in both Variables 1 and 2 are in the same direction. If the sign of the cross-correlation is negative, then changes in both Variables 1 and 2 are in the opposite direction.

Results

Descriptive analysis

As seen in Table 1, when examining the similarities and differences between Therapists 1 and 2, we found a statistically significant difference in CCPT process adherence scores ($t(40.32) = 2.29$, $p < .05$) and no significant differences in the other four measures ($ps > .05$). Therapist 1 was more adherent to CCPT process than Therapist 2.

Therapist 1's treatment

We investigated whether changes in any one component among the TA, ruptures, repairs, adherence to CCPT process, and symptoms of HFASD preceded changes in another. The cross-lagged correlational analyses revealed meaningful change between ruptures and autism spectrum symptoms in Therapist 1's treatment. A statistically significant cross-lagged correlation was found at the +3 lag, where ruptures preceded autism spectrum symptoms ($r = -.47$; $p = .003$); the negative sign indicates that 3 weeks after the patient experienced a rupture, symptoms of HFASD decreased. No other significant cross-correlations were found.

Therapist 2's treatment

Over the course of Therapist 2's treatment, a statistically significant cross-lagged correlation was found between repairs and adherence to CCPT process at the +2 lag, where repairs *preceded* the adherence to CCPT process ($r = .49$, $p = .005$), indicating that 2 weeks after the patient experienced

Table 1. Descriptive analysis.

	Therapist 1		Therapist 2		
	M	*SD*	*M*	*SD*	*t*
Therapeutic alliance	5.00	0.32	4.85	0.43	1.19
Rupture	0.89	0.74	1.00	0.76	−0.52
Repair	0.61	0.69	0.64	0.57	−0.19
Play therapy	0.45	0.10	0.36	0.16	2.29*
Childhood autism	42.14	3.24	42.80	3.85	−0.67

M: mean; *SD*: standard deviation.
*$p < .05$.

repairs, treatment adherence to CCPT process increased. In addition, a statistically significant cross-lagged correlation was found between the TA and HFASD at the −1 lag, where a change in the TA *followed* a change in symptoms of HFASD ($r=-.48$, $p=.006$); the negative sign indicates that 1 week after symptoms of HFASD increased, the TA weakened.

Similarly, a statistically significant cross-lagged correlation was found between HFASD and CCPT at the +1 lag, where a change in symptoms of HFASD *preceded* a change in adherence to CCPT process ($r=-.56$, $p=.001$); the negative sign indicates that 1 week after symptoms of HFASD increased, adherence to CCPT process decreased.

Discussion

This single-case study addresses the following research question: could sequential relations be established among TA, symptoms, and adherence to CCPT process between a child with HFASD and two therapists? We used SMA, a new and easy-to-use type of time-series analysis, to answer this question in the CCPT treatment of a 6-year-old boy diagnosed with HFASD conducted by two therapists in consecutive years. SMA is uniquely well suited for answering this question because SMA controls for dependency problems that render conventional analyses inappropriate to use with multiple-session, single-case data sets with far fewer observations (Borckardt et al., 2008). For these reasons, private practitioners and training clinics interested in using statistical methods to answer questions about sequential relations—as well as contributing to a growing data base of single-case research—should consider using SMA.

To address the research question of process change, we used SMA to determine the sequential relations among TA (including ruptures and repairs), symptoms, and session adherence to CCPT process. In Therapist 1's treatment, symptoms of HFASD lessened 3 weeks after a rupture had occurred. In Therapist 2's treatment, treatment adherence to CCPT process increased 2 weeks after a repair had occurred. The TA weakened 1 week after symptoms of HFASD increased. Finally, adherence to CCPT process decreased 1 week after symptoms of HFASD increased. Process changes between the therapeutic relationship and symptoms thus appear to be bidirectional. In Therapist 1's treatment, a rupture occurred, *then* 3 weeks later, symptoms of HFASD lessened. In Therapist 2's treatment, symptoms of HFASD increased, *then* 1 week later, TA weakened. This latter result represents a situation in which the symptomatic tail is wagging the psychotherapy process dog.

One way to interpret these findings is that when ruptures occurred with this patient who was wary of closeness, he actually became *less* symptomatic. In other words, he might have paradoxically experienced the occurrence of a rupture as a relief—an escape from closeness with the therapist. This relief in turn made him less generally symptomatic. On the other hand, when symptoms increased, the TA suffered, perhaps because the patient had been feeling too close to the therapist, increasing symptoms and later weakening the TA.

Both the TA and adherence to CCPT decreased 1 week after symptoms increased because (1) the symptom increase indicates the patient's discomfort with the developing the TA, thus, the symptom increase might signify his pulling back from the TA and (2) the TA and adherence to CCPT are correlated, $r=.65$, $p=.001$, thus, it makes sense that both would behave similarly 1 week after an increase in symptoms. It is important to keep in mind that we are not referring to therapist–patient interactions in one particular two-session sequence; this SMA finding represents a *pattern* of two-session sequences that recurred throughout the duration of treatment between Therapist 2 and the patient.

We want to draw two conclusions from these data. First, depending on the treatment uniquely created by the therapist and patient, symptomatic change can precede or follow change in the TA (including ruptures and repairs). Most research studies have reported correlations between TA and

treatment outcome (e.g. Crits-Cristoph et al., 1993), but far fewer studies have reported the direction of this correlation. Based on the current data from this single-case study, the answer appears to be that the relationship is bidirectional and depends on the interaction of the two members of the therapeutic dyad. Second, a psychiatric diagnosis such as HFASD might yield paradoxical findings. In the present study, the occurrence of a rupture resulted in *fewer* HFASD symptoms 3 weeks later. When considering how symptom change occurs in child psychotherapy, moderators such as psychiatric diagnosis or developmental stage could have a paradoxical effect on the relations between process and outcome.

We also observed that contrary to the hypothesis, a symptom increase preceded a decrease in session adherence to CCPT process. Conventional wisdom suggests that session adherence improves treatment outcome; however, slavish adherence to a treatment model can also worsen it (Castonguay et al., 1996). In Therapist 2's treatment, perhaps the patient's symptom increase provoked Therapist 2 to veer away from adherence to CCPT process and do something else such as try more supportive techniques the following week in order to stabilize the patient. Incidentally, it should be noted that Therapist 2 was less adherent to CCPT process than Therapist 1. In the context of this analysis, his interventions might have been more flexible than Therapist 1's interventions. He seemed to be more responsive to the patient's symptom levels.

Finally, the occurrence of a repair preceded an increase in session adherence to CCPT process. Perhaps the repair implicitly gave the therapist permission to adhere more closely to the CCPT process prototype after 2 weeks. Overall, these data suggest that session adherence to a treatment model prototype might not always cause changes in symptoms; rather, the reverse might be true. In naturalistic environments, therapists might also be more willing to sacrifice treatment model integrity for symptom improvement, which could account for effective treatment outcomes in naturalistic studies compared to randomized controlled clinical trials in both psychotherapy (Abbass, Hancock, Henderson, & Kisely, 2006; Driessen et al., 2015; Leichsenring & Rabung, 2008; Minami et al., 2008, 2009; Shadish & Ragsdale, 1996) and medical (Benson & Hartz, 2000; Concato, Shah, & Horwitz, 2000) research more generally.

In summary, we have successfully used SMA to test why a patient diagnosed with HFASD changes over time. We hope to have demonstrated that private practitioners and training clinics can answer questions such as this one with individual cases and at the same time contribute to the empirical literature on psychotherapy process and outcome.

Conclusion

Conventional time-series analysis has been seldom used to determine the order of events in child psychotherapy sessions. SMA is a recent, more sophisticated time-series analysis that requires fewer therapy sessions to test for process change and treatment effectiveness. In the present study, SMA demonstrated that child psychotherapy process differs by therapist, even when the child patient remains the same. Ruptures in the therapist–child relationship actually reduce symptoms in a child diagnosed with HFASD. Depending on the circumstances, changes in child symptomatology can precede as well as follow changes in child psychotherapy process; thus, therapists cannot assume that symptomatology is always an outcome of the psychotherapy process.

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