

# Implementing Dynamic Assessments in Psychotherapy

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## Abstract

In this article, we organize multimethod, multimescale data around the interpersonal situation, a conceptual framework that can be used to integrate personality, psychopathology, and psychotherapy constructs in order to guide the assessment of clinical dynamics. We first describe the key variables of the interpersonal situation model and articulate methods for assessing those variables as they manifest (a) across different levels of personality, (b) across situations, and (c) within situations. We next use a case to demonstrate how to assess aspects of the interpersonal situation in a manner that enhances case conceptualization and facilitates the evaluation of clinical hypotheses. We also use this case to highlight challenges and decisions involved in implementing dynamic assessment in psychotherapy. We conclude by outlining areas in need of further exploration toward a more sophisticated approach to clinical practice that involves the routine assessment of dynamic processes.

## Keywords

dynamics, interpersonal circumplex, psychotherapy, assessment, personality

Mental health care is undergoing a significant transition toward evidence-based practice (Anderson, 2006). This transition involves implementing clinical techniques based on evidence rather than authority, integrating science and practice in the application of clinical care and evaluating clinical hypotheses using case-specific data. However, much of the push toward evidence-based practice has occurred relatively independently from advancements in assessment science. For example, a major theme of the evidence-based practice movement involves the application of psychotherapy approaches that have demonstrated efficacy in randomized controlled trials. Yet meta-analytic research shows that different manualized treatments designed for specific disorders are generally similarly effective in meaningfully improving the problems of around half of psychotherapy patients, regardless of the theoretical tradition from which they come (Wampold, 2013). What is typically missing from this research is a careful consideration of specific factors unique to a particular patient, clinician, or dyad that may explain differential responses to treatments (Os, Delespaul, Wigman, Myin-Germeys, & Wichers, 2013; Smith, 2012). A more thoughtful assessment approach would measure factors related to patient functioning that cannot be described by highly general diagnostic and therapeutic labels. Such an approach would leverage sophisticated assessment and analytic methods to understand patients in multiple contexts, using multiple measurement

methods, at multiple levels of personality and behavior, and at multiple timescales. In this article, we focus on the assessment of dynamic factors in psychotherapy, a topic which has received relatively little attention from the evidence-based psychotherapy movement, is only beginning to gain traction in research, and is rarely applied in practice (Boswell, Anderson, & Barlow, 2014; Fisher, 2015). By dynamics, we mean within-person variability, either across different levels of analysis at one time or across different occasions, on some assessment variable.

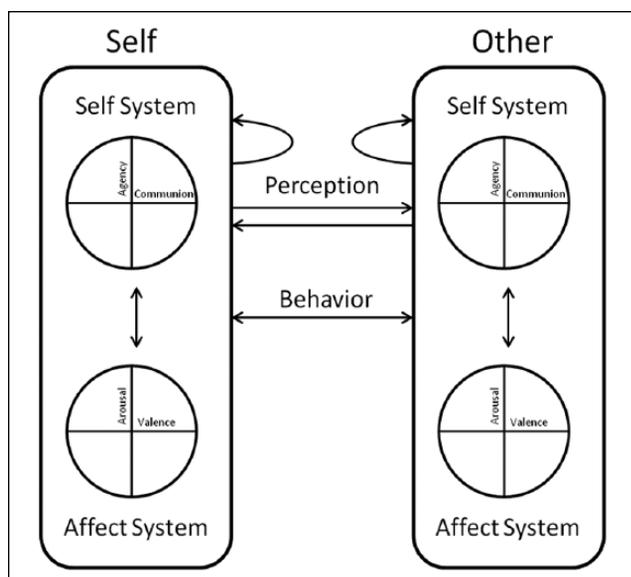
We assert that several steps are in order before the assessment of dynamics can become a more routine element of applied practice. First, a clinically useful and empirically tractable framework is needed for conceptualizing dynamics. Ideally, this framework would be grounded in theory, connected directly to validated assessment methods, and flexible enough to apply to a wide range of populations regardless of the clinician's theoretical perspective (e.g., Pincus et al., 2014). Second, efficient and valid assessment procedures for measuring the variables relevant to dynamic

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**Figure 1.** The interpersonal situation.

assessment must be developed. Third, data-analytic tools that can provide practical and useful information based on dynamic assessment data and which can be relatively easily applied by clinicians without extensive statistical expertise are needed. Having established a conceptual framework, measurement methods, and analytic tools, research evidence and practical guidelines regarding dynamic assessment would need to be disseminated and taught so that clinicians could implement dynamic assessments in their practice.

With an eye toward filling this gap, this article focuses on measuring, analyzing, and making clinical use of dynamics that occur within clients and between clients and clinicians. We begin by describing a transtheoretical conceptual model for formulating clinical dynamics and evaluating treatment effects. We use this model to measure three kinds of clinical dynamics which can occur (a) across different levels of personality at a given time, (b) across different situations, and (c) within single situations. We then use a case to examine how data collected using multiple methods at multiple timescales can be used to test dynamic clinical hypotheses and conclude with a discussion of the work that needs to be done to facilitate the migration of this kind of approach to assessment instruction and practice.

## The Interpersonal Situation

The *interpersonal situation* is a model of the various intrapersonal and dyadic factors that are relevant for understanding clinically salient dynamics as they unfold across multiple levels of analysis (Figure 1; Hopwood, Wright, Ansell, & Pincus, 2013; Hopwood, Wright, & Pincus, in press; Hopwood, Zimmermann, Pincus, & Krueger, 2015;

Levendosky & Hopwood, 2016; for detailed theoretical elaboration, see Pincus, 2005; Sullivan, 1953). The interpersonal situation focuses on interactions between a self and an other, who may be a proximal person in a real interaction or a mental representation (Pincus, Lukowitsky, & Wright, 2010). Note that the focus on a self and an other can be construed as a specific theoretical assumption about the nature of personality and psychopathology (Kernberg, 1976; Pincus, 2005; Sullivan, 1953). However, this assumption is not necessary for using the model to assess clinical dynamics. Instead, we assert that focusing assessment at the level of the dyad is appropriate in situations, such as clinical assessment or psychotherapy, which are ipso facto dyadic given that there are two people interacting with one another (Blais & Hopwood, in press).

Within the self and other are systems that regulate the self and affects (Pincus, 2005). The *self system* comprises identity, motives, and self-concept and is arranged around the metaconstructs agency and communion (see Beck, Freeman, & Davis, 2004; Blatt, Auerbach, & Levy, 1997, for similar models). Individuals tend to view themselves as more or less agentic (powerful, successful) and communal (connected, affiliative) and to organize their experiences and goals around combinations of these two dimensions. To the degree that agentic and communal goals are satisfied, people have well-regulated and functional identities and self-concepts (Horowitz et al., 2006).

The *affect system* encompasses emotional experiences, which are arranged according to a two-dimensional model in which emotions are thought to vary according to arousal (activated to calm) and valence (positive to negative; Posner, Russell, & Peterson, 2005). Affect dysregulation in the form of emotional instability, impulsivity, or intense negativity signals problems in interpersonal situations. The affect and self systems are typically connected as situations unfold, as depicted by the vertical double-headed arrow in Figure 1. Both self and other have self and affect systems. Clinically, the focus is typically on the dynamics of these systems within the self (i.e., the client), although the dynamics of the other (e.g., countertransference reactions in the clinician, informant report data from people who are close to the client, ecologically momentary assessment data in which the client reports about others) are also important.

The *interpersonal field* involves transactions that occur between self and other (Wiggins & Trobst, 1999). These transactions can be organized around the interpersonal dimensions of dominance versus submission and warmth versus coldness. Disruptions in the interpersonal field are common in life and psychotherapy and often a focus of clinical attention (Safran & Kraus, 2014). Research on interpersonal relations consistently supports the concept of complementarity (Sadler, Ethier, & Woody, 2011), or that dominance is usually met with reciprocal submission and warmth with similar warmth, as a baseline framework for

evaluating the adaptiveness of interpersonal transactions. The horizontal double-headed arrow in the middle of Figure 1 depicts the interpersonal field. Finally, the arrows toward the top of the figure indicate perceptual processes, including the self's perception of other, other's perception of self, and each person's self-perception. The misperception of some aspect of interpersonal situations, often for psychological reasons (e.g., distortions of others that are motivated to maintain some important aspect of identity) represents a central difficulty in psychopathology. This is why many psychotherapeutic traditions (e.g., psychodynamic and cognitive therapy) focus on misperception as a core mechanism of client difficulties.

To summarize, the interpersonal situation as depicted in Figure 1 identifies the core dimensions of personality as they interact in self–other dyads. While there are clear connections between the variables in Figure 1 and a number of other nomothetic models of personality (Hopwood et al., 2015), in the present model, personality is understood through the lens of dynamic interpersonal transactions that involve a self, an other, and a linking affect (Fonagy & Bateman, 2006; Kernberg, 1976; Pincus, 2005). It is assumed that personality “changes” according to the contextual features of interpersonal situations (Mischel & Shoda, 1995). This model thus provides a theoretically integrative and practically manageable framework for translating test data into the rich experiences that occur in clinical practice.

## Assessing Clinical Dynamics

Clinical assessment data can be understood as occurring at three levels of dynamics within interpersonal situations (Hopwood et al., 2015). First, individuals may vary in terms of certain attributes that might manifest across different levels of personality such as the discrepancy between explicit/conscious and implicit/unconscious motives. To the degree that different assessment methods are differentially sensitive to different levels of behavior, patterns in multimethod assessment data can often be used to make inferences about discrepancies at these different levels (Bornstein, 2009; Leary, 1957). Second, individuals may vary in terms of how they behave from one situation to the next. Between-situation dynamics have been the focus of one of the most popular recent forms of dynamic assessment research, involving the use of diaries, smartphones, or other ambulatory technologies to sample behaviors at different points in individuals' daily lives (see multiple articles from this Special Issue using such techniques). Third, individuals may vary from one moment to the next within a single interaction such as when a warm and friendly interaction becomes cold and distant due to some kind of interpersonal rupture in a psychotherapy session (Thomas, Hopwood, Woody, Ethier, & Sadler, 2014).

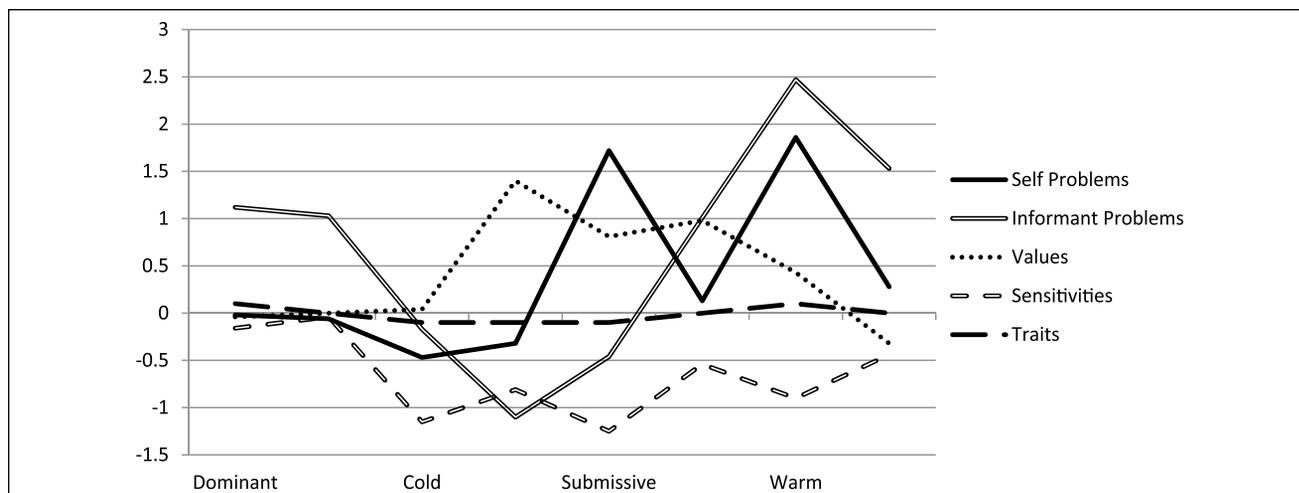
The challenge, from an assessment perspective, involves collecting data that can provide reliable information about dynamics that occur across different levels of behavior (such as when a patient is not aware of an important aspect of her or his personality), across different situations (such as when a patient's symptoms emerge in some contexts but not others), and across time within situations (such as different parts of a therapy session) and then collating those data into an efficient and integrative formulation. To address this challenge, we have been implementing a variety of assessment techniques at the Michigan State University Interpersonal Problems Clinic (Levendosky & Hopwood, 2016) that are organized around the interpersonal situation model. In so doing, we have tried to balance our desire to collect rich assessment data against our need to do so efficiently. In this article, we describe a case from our clinic to demonstrate how multimethod assessments of each of these kinds of dynamics can inform clinical practice.

Although we collect a range of assessments, we will focus here primarily on data that can be organized using the two dimensions of the interpersonal circumplex (IPC; Leary, 1957). The nature of these dimensions is such that they have implications for the self, behavior, and perception in the interpersonal situation, so that much of what is depicted in Figure 1 can be accounted for via IPC assessment. We use six cross-sectional methods to assess IPC variables across different levels of personality (Dawood & Pincus, 2015): self-reported traits (Morey, 1991), problems (Soldz, Budman, Demby, & Merry, 1995), values (Locke, 2000), and sensitivities (Hopwood et al., 2011); other-reported problems; and narrative-based themes based on responses to selected cards from the *Thematic Apperception Test* (TAT; Murray, 1943). We use a daily diary method to collect information about dynamics that occur across interpersonal situations in patients' daily lives and a *Continuous Assessment of Interpersonal Dynamics* (CAID; Sadler, Ethier, Gunn, Duong, & Woody, 2009) procedure to collect information about dynamics that occur within assessment and therapy sessions.

## Case Example

In what follows, we describe a collaborative assessment (Finn, 2007) and brief (16 session) therapy of a 21-year-old European American man we will call Adam who presented at our clinic with symptoms of depression and social anxiety and concerns about some upcoming decisions regarding his future. He was diagnosed with major depressive disorder based on test data and diagnostic interview. During the first session, Adam and his clinician developed three questions to guide the assessment: (a) How can I decide what I really want in life? (b) Why do my feelings change so often? and (c) Why do I see things differently from others?

After the first session, he completed the *Personality Assessment Inventory* (PAI) as well as the IPC questionnaires described above. He also completed the *Working*



**Figure 2.** Cross-level interpersonal functioning data.

Note. *y*-Axis is in Z score units, with norms are based on validation studies using either student or community samples. Based on the reliabilities of these measures, differences  $>.5z$  can comfortably be regarded as significant. Although there are data points for all eight octants of the IPC, only nodes are given below the figure, and the octants are inferred for traits, given that the Personality Assessment Inventory does not have octant scales.

*Alliance Inventory* (Hatcher & Gillaspay, 2006) and *Inventory of Interpersonal Problems–Short Circumplex* (IIP-SC) following the 3rd, 8th, and 16th sessions. Between the first and second sessions, he solicited a roommate to complete the informant-report IIP-SC, and completed a paper-and-pencil daily diary that included 25 interactions with others in his life. This diary consisted of ratings of self and other dominance and warmth, as well as overall feeling in terms of valence for each interaction that the patient considered significant or meaningful. Each of these constructs was defined and examples at different anchor points on the scale were given during the first session. The patient confirmed that he completed the daily diary about significant interactions at the end of each day between the first and second sessions. He provided stories for four TAT cards during the second session. Four trained raters who were otherwise uninvolved in the case provided CAID codes for Sessions 1, 3, 8, and 16. In this procedure, each coder observed each person in the interaction one at a time while they manipulated a computer joystick to code for dominance versus submissiveness (up or down) and warmth versus coldness (right or left). The software saved one data point every half second during the entire interaction (see Lizdek, Sadler, Woody, Ethier, & Malet, 2012).

### *How Can I Decide What I Really Want in Life?*

A relative elevation of 62T on the Identity Problems scale of the PAI was consistent with Adam's first concern about existential indecision and anxiety about the future. He expected to graduate within the next year. He had selected chemistry as his major, largely due to his parents' expectations that he would be a scientist and his reading of the job

market. However, he remained conflicted because his true passion was in reading and creative writing and he dreamed of being an English teacher. He was also in an on-again, off-again relationship with a woman that had lasted for about 2 years, and while he desired settling down, he did not see himself doing this with her.

Some of the interpersonal mechanisms of his identity problems can be illuminated by considering his cross-level interpersonal dynamics. The octant scores for multiple IPC assessments are displayed in Figure 2, which highlights interpersonal attributes for which he may experience a lack of internal coherence. Adam generally reported valuing submissiveness, but he also described submissiveness, along with warmth, as his cardinal interpersonal problems. He is essentially saying, "I think it is important to let others take the lead, but I do it too often." His self-reported tendency to be overly submissive toward others, along with his denial of any sensitivities about others' behavior (as indicated by low scores for the sensitivities profile) implies a person who may have difficulties asserting himself and making decisions. Interestingly, however, he did not report being particularly submissive on the trait measure, and his roommate reported experiencing Adam as too dominant. Furthermore, his TAT stories consistently involved a strong, dominant protagonist who overcomes some kind of obstacle to achieve something and feel good in the end.

This pattern of data suggests an inner conflict between being a strong, confident person who can make effective decisions but may come across as domineering and attention-seeking versus a more passive, meek person who would prefer to let others take the lead but may feel weak and ineffectual. Note that both Adam and his roommate agreed that he was often too warm, even though he does not necessarily value

**Table 1.** Results From a 1-Week Daily Diary Assessment.

	M	SD	Correlation with feeling
Self Warmth	5.08	0.76	.75
Self Dominance	3.88	0.80	.71
Other Warmth	4.68	1.41	.89
Other Dominance	3.96	0.84	-.29
Feeling	4.76	1.23	—

Note. All items were rated on a scale from 1 to 7. Complementarity correlations were .86 for warmth and -.07 for dominance. Feeling refers to the rating of the degree to which the respondent feels good versus bad, in general, following the rated interaction.

warmth. These data raise the hypothesis that Adam believes he needs to be submissive in order for others to like him, which would conflict with his belief that he needs to be more dominant in order to get what he wants out of life. One example of this pattern involved a suppressed score on the Suicidal Ideation scale of the PAI. Several sessions into treatment, Adam acknowledged some suicidal thinking that he did not initially report for fear that his clinician would reject or think poorly of him. This general pattern was also evidenced in a modest elevation on the PAI Positive Impression Management and Grandiosity scales, which suggests an effort by Adam to cast himself in a relatively favorable light rather than sharing his actual inner experiences. Thus, his first question about how to figure out what he really wants in life pointed directly to dysregulation in his self system, specifically involving conflicts regarding how much to assert himself authentically versus accommodate others' wishes (real or imagined) that may be due to concerns about being liked.

### Why Do My Emotions Change so Often?

Adams's score of 69T on the PAI Affective Instability scale supported the centrality of his concerns about his ability to control his emotions. Daily diary data were collected across 25 interactions with 18 different people to determine what factors in interpersonal situations affect his emotional experience. Specifically, at the end of each day, Adam rated his own dominance and warmth, the other's dominance and warmth, and his feelings (negative to positive) on a scale ranging from 1 to 7 for each significant interaction over the course of that day (Table 1).

His warmth and feeling scores were above the "average" anchor, indicating that Adam believes that in his daily interactions, he and his partners are generally both warm and that he ends up feeling good more often than not. There was also significant variability in these scores. There was relatively strong complementarity for warmth, indicating Adam's perception that his warmth and that of his interaction partner were generally in accord. There was less complementarity on dominance; looking at interaction-level data, it appeared that there were a few interactions where neither party was able to take charge, a

situation that he referenced getting into during one of his sessions. Of significant interest was the correlation between the interpersonal variables and feeling. Adam ended up feeling best when he was able to be warm and dominant, despite stating on the questionnaire that he values being submissive. The strongest correlate of his positive feeling, however, was the others' warmth, supporting the hypothesis that his agentic conflicts are related to his desire to be liked and treated well by others. In other words, Adam is highly responsive to the degree to which his interpersonal needs are met, and his emotions provide important information about those interactions in which he either failed to assert himself or he did not receive the warmth that he desired from others.

### Why Do I See Things Differently Than Others?

The discrepancies between his own and his roommate's interpersonal problems profile aligned with Adam's sense that he sees things differently than others. Whereas he described himself as too warm and submissive, his roommate rated him as being too dominant and warm. The use of observer-coded CAID data offers one way to provide a more balanced description of a patient's interpersonal patterns, while also indicating within-situation patterns that may occur with the clinician (Table 2). Adam was primarily submissive and warm in Session 1, similar to the style of his self-reported problems. The therapist's warm and dominant style complemented Adam, although complementarity was lower for warmth. We note that there was also considerably less variability in warmth for both parties, which probably contributed the relatively lower reliability and complementarity values for this dimension. Interestingly, in Session 3, Adam was appreciably colder and more dominant than he had been in Session 1. This pattern might be understood as reflecting two aspects of his core conflict. In Session 1, he was relatively meek and focused on being warm, perhaps out of concerns about making a good impression on the therapist. By Session 3, he had become significantly more assertive, which perhaps reflected a somewhat more genuine interpersonal orientation, as indicated by the informant-reported problems data. The therapist responded by maintaining warmth but becoming more submissive, which likely facilitated this transition (Table 2). During the session, this dynamic played out in the form of relatively long tangents on the part of the patient, which were followed by a nervous self-consciousness in which he would make self-deprecating remarks about talking too much. Invitations to slow down and describe his feelings made Adam more anxious, often leading to a repetition of the cycle.

### Case Formulation and Treatment

These data were used to develop a formulation of Adam's difficulties, which was used as the basis for making a

**Table 2.** Continuous Assessment of Interpersonal Dynamics Data for Sessions 1, 3, 8, and 16.

	ICC	M	SD	Complementarity	
				Warmth	Dominance
<b>Session 1</b>					
Patient warmth	.35	488.34	69.57	.16	-.91
Patient dominance	.84	-115.80	220.00		
Therapist warmth	.38	259.03	46.09		
Therapist dominance	.90	83.31	224.48		
<b>Session 3</b>					
Patient warmth	.54	-0.09	100.51	.13	-.90
Patient dominance	.82	147.57	176.26		
Therapist warmth	.27	170.01	27.08		
Therapist dominance	.63	-192.49	172.90		
<b>Session 8</b>					
Patient warmth	.32	-23.56	101.96	.25	-.79
Patient dominance	.69	227.28	125.16		
Therapist warmth	.23	235.28	24.68		
Therapist dominance	.72	-163.84	154.61		
<b>Session 16</b>					
Patient warmth	.48	-5.17	68.89	.51	-.92
Patient dominance	.86	132.23	142.36		
Therapist warmth	.55	180.96	27.52		
Therapist dominance	.93	-97.88	146.32		

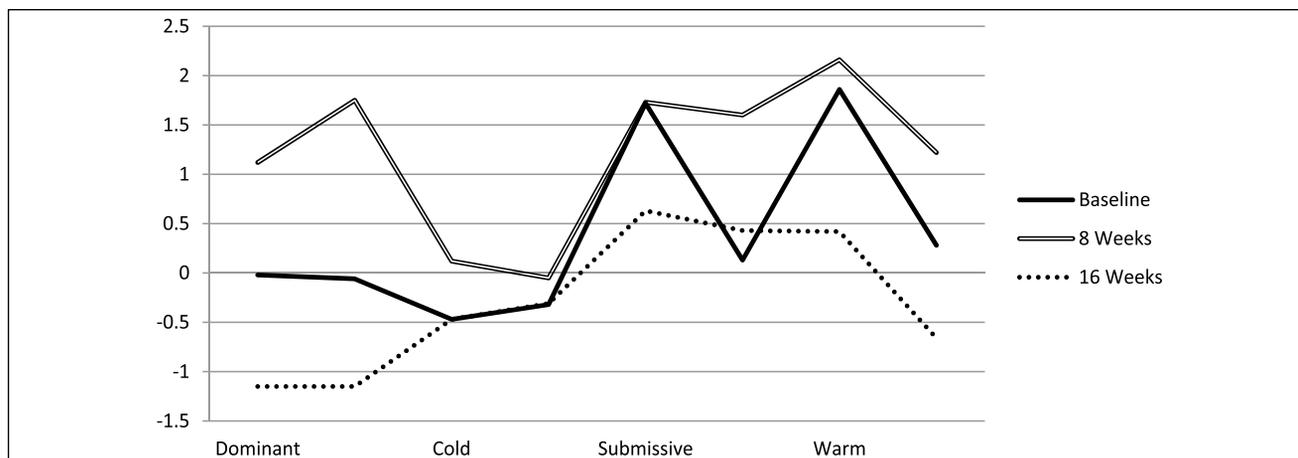
Note. ICC = intraclass correlation coefficient; indicates agreement among the four coders (note that relatively low agreements for warmth variables were likely affected by the variance in those time series). Complementarity indicated by the cross-correlation between the time-residualized patient and therapist warmth and dominance scores. The range scale of these data points, for example, range from -1,000 to 1,000.

treatment plan and predictions about his behavior over the course of therapy. Adam has a central conflict between wanting to be liked and wanting to achieve for himself. He believes he is liked when he is submissive so that others can get what they want, but that he achieves his own goals when he is dominant. This is, therefore, a zero-sum game for him: Either he can make others happy or he can make himself happy. His submissive behavior is often unsatisfying and unnatural and ultimately gives way to a more dominant style. His dominant behavior can be experienced by others as attention-seeking, shallow, and annoying. He experiences affect dysregulation in the form of depression when he is too submissive and anxiety when he experiences himself as too dominant, and in both cases, these negative emotions center on the thought that others may not approve of him. He lacks insight about others' perception of him as generally likeable but relatively self-centered. In fact, he thinks just the opposite, that others might see him as trying too hard to please them and as, therefore, unlikeable.

Based on this formulation, two stepwise goals were developed for the treatment sessions. The first step involved allowing Adam to be more dominant in the absence of shame or ruminative anxiety. Specifically, the clinician would discuss with him and show through her behavior that she accepts his desire to assert himself in interpersonal

situations. A primary mechanism of this step involved the clinician adopting a relatively submissive position (Table 2), to facilitate this aspect of the therapeutic process via complementarity (Tracey, 1993). By Session 8, Adam was interacting in a more dominant manner with the clinician (Table 2) and reported a significant increase in dominant interpersonal problems (Figure 3).

The second goal was to help Adam consider, more thoughtfully and with less anxiety, the decisions that concerned him regarding his career, interests, and romantic relationships. As can be seen in the Table 2, the interpersonal process established by Session 3 did not change appreciably by Session 8. Adam actually became somewhat more dominant even though the therapist had not become more submissive. Complementarity coefficients were also stable, and Adam's report of the working alliance remained high across all assessments. However, the content of the session changed somewhat, with the therapist persistently focusing Adam's attention on inner feeling states, to help him make connections between the themes that were being discussed, the interpersonal process, and his interpersonal goals. Adam became more able to notice the degree to which his behavior was affected by concerns of being liked and how his compensations for those concerns actually did not result in more likeable behavior.



**Figure 3.** Interpersonal problems profile at baseline, 8 weeks, and 16 weeks.

Note. y-Axis is in z score units, with norms are based on validation studies using either student or community samples. Based on the reliabilities of these measures, differences  $>.5z$  can comfortably be regarded as significant.

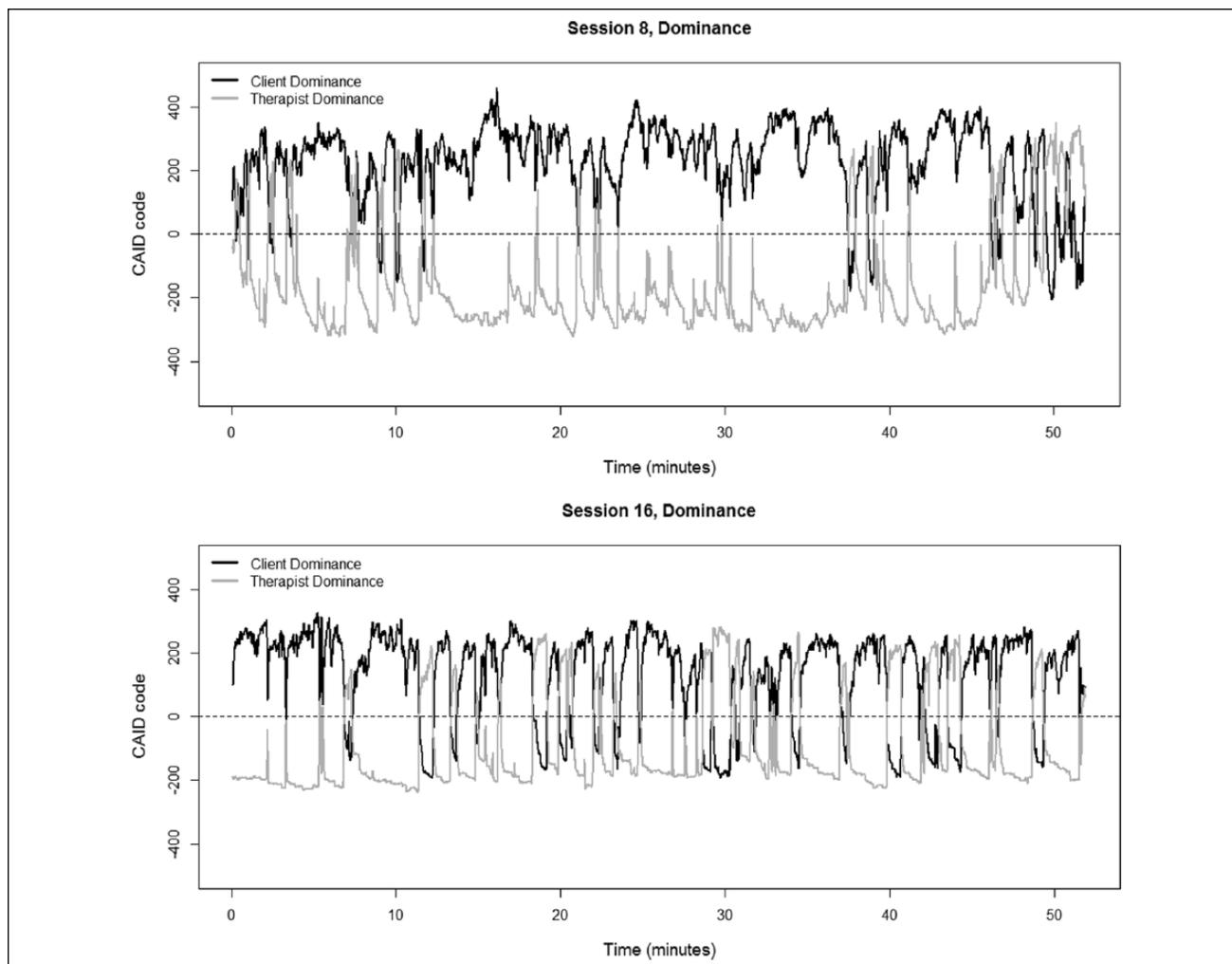
By Session 16, therapeutic complementarity increased somewhat (Table 2). Figure 4 provides a more fine-grained window into the differences in interpersonal process from Sessions 8 to 16. In Session 8, Adam spends most of the time being dominant and there is relatively limited reciprocity. Although the range of dominant behaviors is pretty similar across the sessions, the mean is appreciably higher in Session 8 because he is submissive less often. He is essentially controlling the session, and the therapist's efforts to intervene are brief and tend not to fundamentally alter the dynamic. By Session 16, there is greater reciprocity, and the therapist spends more time in the dominant position. Thus, their means are closer to one another and the complementarity correlation is higher (Table 2). This difference suggests that Adam has begun to integrate the two sides of his conflict in his relationship with the therapist: He is still dominant more often than not, but he is able to give way to the therapist's dominance at times, and there is greater synchrony in their interaction. Concordant with these changes in his interpersonal process was a significant reduction in his IIP-SC scores (Figure 3). Furthermore, Adam had accepted an offer for a job as a chemist following graduation, ended his unsatisfying relationship, and had joined a reading group which he found personally fulfilling.

## Discussion

In this article, we demonstrated the assessment of cross-level, between-situation, and within-situation dynamics in a clinical case using the conceptual framework of the interpersonal situation. Dynamic assessments allowed the clinician to move beyond the application of a packaged treatment for a generically depressed client toward a sequence of interventions that were tailored to the specific dynamics

underlying the client's presentation and whose impacts could be assessed relatively directly. Data from the case were used to identify an important dynamic across different levels of the client's personality that distinguished him from other depressed patients: Whereas Adam perceived himself as passive and needy, others saw him as too dominant and intrusive. Second, an important dynamic across situations was identified in daily diary data: Adam's affect depended strongly on the degree to which others were friendly toward him, in addition to his own sense of being able to assert himself. Third, an assessment of within-session dynamics helped the clinician identify and engage in patterns that could encourage therapeutic change. By adopting a relatively submissive stance, the therapist used complementarity to encourage Adam's dominance, which could then be calibrated over the course of therapy, during which time the therapist became progressively more dominant so that power could be shared within the dyad. Finally, multi-method data were used to monitor treatment progress at multiple levels of analysis. Improvements in functioning as assessed by these data harmonized with changes that occurred in Adam's life.

An important implication of this case demonstration is that the therapist is not only an active ingredient in successful psychotherapy but she or he also offers a powerful source of data and means for testing clinical hypotheses. In contrast to long-standing antagonism between research and practice, we hope that a shift in focus toward assessing dynamics will encourage a mutual understanding of the complementary nature of clinical practice, research design, and data analysis. For instance, whereas it can be very difficult to parse cause-effect relationships statistically in time series data, in the case described above, the therapist was able to enter into sessions with a particular interpersonal



**Figure 4.** Raw Continuous Assessment of Interpersonal Dynamics (CAID) time series data for client and therapist dominance during Sessions 8 and 16.

Note. Although the range of the CAID is from  $-1,000$  to  $1,000$ , the y-axis is trimmed for clarity.

goal in mind in order to evaluate its impact on the client's behavior. By systematically adjusting her own behavior and then assessing the impacts of those adjustments on the patient, the therapist becomes a participant observer who can collaborate with the client to test personally relevant clinical hypotheses.

### *Challenges in Implementing Dynamic Assessments in Clinical Practice*

Despite the significant promise of dynamic assessment methods for improving clinical practice, there are significant challenges to their routine implementation. These include, among others, (a) efficiently assessing all of the variables of potential interest, (b) obtaining good data, and (c) data analysis. We will address each of these challenges in turn.

This work was conducted in a training clinic with explicit expectations on the parts of clients, therapists, and supervisors regarding the integration of training and research with clinical care, as well as the resources (e.g., time, money, materials) necessary for such integration. For instance, there is a general expectation that clinical data may be used for research, that supervisors will watch videos of the therapy sessions, and that the clinicians are not relying on the work for their livelihood. Most clinicians in private practice do not have the time to assess patients at the level of detail that we assessed Adam, particularly given existing reimbursement schedules and the mandates of various health care agencies.

Moreover, some of the more novel assessment methods we used have some unknown psychometric properties for the kinds of applications we demonstrated. For this reason, it is imperative that researchers begin to focus on the

validity and added value of dynamic assessments in order to advance the goal of incorporating them in clinical practice. However, in an age of increasing demands for efficiency, validity evidence will not be enough. The methods that can be used to assess dynamic processes need to be made more efficient. For instance, our group is currently working on a method to automate the CAID procedure, which would significantly reduce the time required to gather these data. A number of researchers are similarly working on ways to make ambulatory assessment easier, and there is significant potential in using data from social media or other sources in a manner that can facilitate clinical practice.

There were a number of weaknesses in some of the data we presented in this case. The ambulatory method used a daily rating design with paper-and-pencil format that comes with limitations including the possibility of day-level retrospective bias and an inability to gather objective data about when the assessments occurred. The dynamic assessments were interpreted in the absence of norms from clinical or other populations. Although some norms are available for ambulatory assessment methods, they are limited by the wide variability in methods currently being used to collect these data and by the limited number of samples who have participated in ambulatory assessment studies. Clinical norms are currently unavailable for the CAID data. Nonclinical data that are available are from participants who are engaged in tasks that differ substantially from psychotherapy with interaction partners who are not psychotherapists. Therefore, interpretations of these data, however, may line up with our predictions, need to be interpreted with caution, and more research is needed on their viability for clinical practice. This applies to other promising dynamic techniques that use psychophysiological, implicit, or experimental methods as well.

Finally, although we have used and published other kinds of data analysis in the past (e.g., Thomas et al., 2014), in this case demonstration, we relied on relatively simple descriptive and correlational analyses. A variety of other approaches are available, many of which were emphasized in other articles in this Special Issue. These approaches could be used to test a variety of potentially interesting hypotheses. For example, there may be value in testing the presence of cause–effect relationships (Granger, 1969), the degree to which relationships are consistent across time (Wright, Hallquist, Swartz, Frank, & Cyranowski, 2014), the presence of cyclical patterns (Sadler et al., 2009), or the presence of meaningful qualitative shifts (Hollenstein, 2007) in time series data. It may also be useful to determine the degree to which patterns for a particular individual or dyad are representative of a larger population (Gates, Molenaar, Iyer, Nigg, & Fair, 2014), or to apply an array of methods to understand dynamic processes in group-level data while also accounting for various dependencies associated with modeling time (Raudenbush & Bryk, 2002) and

dyads (e.g., Kenny, Kashy, & Cook, 2006). Each of these techniques and a number of others could potentially yield rich insights in dynamic clinical data.

The issue is that practitioners are unlikely to apply these techniques without significant facilitation by researchers. We sought to present results that were highly familiar, intuitive, and tractable for applied situations. There is a general need to find a middle ground between sophisticated data analyses that are often beyond the skill sets of many full-time academics and the practical contingencies of the applied clinician. Two specific goals are in order. First, guidelines are needed to connect the results of data analyses to clinical concepts that resonate in day-to-day practice. This Special Issue provides an important but preliminary step in that direction. Second, software is needed that can provide straightforward output regarding dynamic assessments. Considerable work is needed on both of these fronts.

In summary, we believe that the technology is available to begin applying dynamic assessment procedures to clinical practice, and doing so will likely have significant benefits for mental health and the promotion of evidence-based and patient-centered assessment and therapy. However, significant work remains to be done to develop and implement dynamic measurement and analytic tools. We have described the interpersonal situation, a conceptual model that can be used to guide this work, and demonstrated both the advantages and challenges of dynamic assessment in clinical practice using a psychotherapy case study. We hope that this article and Special Issue promotes continued efforts toward improving mental health care by describing the dynamic processes that characterize human problems and solutions.

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