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Innovative Approaches to Exploring Processes of Change in Counseling Psychology: Insights and Principles for Future Research

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In recent years, innovative approaches have been implemented in counseling and psychotherapy research, creating new and exciting interdisciplinary subfields. The findings that emerged from the implementation of these approaches demonstrate their potential to deepen our understanding of therapeutic change. This article serves as an introduction to the "Innovative Approaches to Exploring Processes of Change in Counseling Psychology" special issue. The special issue includes articles representing several of the most promising approaches. Each article seeks to serve as a sourcebook for implementing a given approach in counseling research, in such areas as the assessment of coregulation processes, language processing, physiology, motion synchrony, event-related potentials, hormonal measures, and sociometric signals captured by a badge. The studies included in this special issue represent some of the most promising pathways for future studies and provide valuable resources for researchers, as well as clinicians interested in implementing such approaches and/or being educated consumers of empirical findings based on such approaches. This introduction synthesizes the articles in the special issue and proposes a list of guidelines for conducting and consuming research that implements new approaches for studying the process of therapeutic change. We believe that we are not far from the day when these approaches will be instrumental in everyday counseling practice, where they can assist therapists and patients in their collaborative efforts to reduce suffering and increase thriving.

Public Significance Statement
In recent years, innovative approaches to capturing the process of change, as it unfolds from one moment to the next, have been implemented in counseling and psychotherapy. This special issue contains articles from scholars around the world, each one focusing on a promising approach, and provides instructive information on how to implement the approaches in counseling and psychotherapy and how to interpret the collected data to advance our understanding of both processes and outcomes. This introductory article describes a set of guidelines that can help elucidate the differences and similarities between the approaches and facilitate their implementation in counseling and psychotherapy research.

Keywords: interdisciplinary approaches, biomarkers, process of change

For decades, self-report measures, observer ratings, and interviews with patients and therapists have been the most common ways to assess the process of counseling and psychotherapy and to quantify its efficacy and effectiveness. These methods have produced a vast body of knowledge, laying the foundation for an empirically informed approach to counseling and psychotherapy. We currently know much more about the therapeutic process than we did 5 decades ago, and numerous overviews of the scientific areas of research in these domains speak to its progress and diversity (Buboltz, Miller, & Williams, 1999; Hill, Nutt, & Jackson, 1994; Oh, Stewart, & Phelps, 2017; Zilcha-Mano, 2019). Despite their unquestionable merit, traditional assessments such as self-report measures have multiple limitations, including impression management, cognitive heuristics such as anchoring, and more. Moreover, these measures have restricted the fields of counseling and psychotherapy research to focusing on the processes that patients and therapists can report about at the end of a session or at the end of their treatment, often failing to address many critical processes of therapeutic change. This has broadened the gap between what is of interest to clinical practice and what is of interest to research (Morrow-Bradley & Elliott, 1986). Some of the processes of therapeutic change can be captured by clinically rich coding systems that have been developed over the years (Eubanks, Lubitz, Muran, & Safran, 2018; McCarthy & Barber,

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2009; Solomonov, McCarthy, Gorman, & Barber, 2019; Wiseman & Tishby, 2014). But because the use of such coding systems is generally a time- and effort-consuming process and requires the training of coders, it has been necessary to restrict the number of sessions coded for each individual, limiting the ability to fully capture processes of change within individuals.

All these limitations, and more, have encouraged researchers to develop and implement different, less subjective, and more easily applicable methods to complement existing measures for assessing the process and outcome of counseling and psychotherapy. There are also other reasons that have led researchers to explore new methodologies, including reducing costs and discovering new nuances in the process of therapeutic change, which are difficult to capture using more traditional approaches. Many of the new approaches have originated from other fields of science and are therefore interdisciplinary in nature.

Although we use the term *new* to refer to the line of research that has been emerging in recent years, note that the implementation of such interdisciplinary approaches is not new to counseling psychology, and its potential has been acknowledged as early as 50 years ago, when researchers started using video coding to study such constructs as microcounseling skills. The *Journal of Counseling Psychology* has a long-standing tradition of publishing findings and methods in the domain of process measures, and several articles provide good overviews of the state of the art at the time (Hill & Corbett, 1993; Oh et al., 2017; Wampold & White, 1985). One example of this tradition is an article by Ivey, Normington, Miller, Morrill, and Haase (1968) that describes a video method of training counselors in microcounseling skills, stressing the importance of listening and attending to patients both verbally and nonverbally. Additional studies focused on counselor behaviors that indicate expertness versus inexpertness (Schmidt & Strong, 1970), empathy, respect, and genuineness (Tepper & Haase, 1978). These studies attest to the keen eye and established tradition of process research in counseling psychology. Other seminal studies explored simultaneous covariation in the physiological activity of patient–therapist dyads (Coleman, Greenblatt, & Solomon, 1956; Di Mascio, Boyd, & Greenblatt, 1957; Di Mascio, Boyd, Greenblatt, & Solomon, 1955). But technological challenges prevented the realization of these approaches to their full potential. Thus, much of the aforementioned innovative pioneering research slowly "disappeared" from the mainstream research agenda. The rediscovery of these approaches has been made possible by new pathways opened up with modern equipment, automation, and artificial intelligence tools. New technological possibilities now make it feasible and affordable to implement these approaches in clinical settings. The "new" approaches also provide a potential remedy for the crisis in psychological science (Open Science Collaboration, 2015; Tackett, Brandes, King, & Markon, 2019): New methodological possibilities can make it easier to achieve a stronger emphasis on idiographic, holistic, and interactional approaches (Lundh, 2019).

Emerging Subfields of Investigation

In the last decade, we have witnessed rapid development in many fields of technology, biology, and medicine, as well as a great flourishing of computer-assisted technologies (Burgoon, Magnenat-Thalmann, Pantic, & Vinciarelli, 2017). This advancement is highly visible in the field of artificial intelligence (AI). Both the application of AI in assessment and analysis of counseling and psychotherapy data (Dwyer, Falkai, & Koutsouleris, 2018; Nasrallah, 2019) and its implementation in clinical practice (e.g., DeVault et al., 2014) demonstrate its great potential. The same is true for physiology, neuroendocrinology, speech, and so forth. As a result, there has been renewed interest in these and other new approaches used to capture efficiently the process and outcome of counseling and psychotherapy and, consequently, an expansion in the use of these approaches. When applied in a way that acknowledges both their limitations and their promise, these approaches have a great deal to offer to counseling and psychotherapy research. They can provide new screening tools and reduce costs when integrated with other assessment tools, standardize the measurement of complex constructs in counseling and psychotherapy research, and expand observations to include session-to-session measurement of change while also focusing on the process of change within each session. The ability to zoom in and out of the processes of change can be instrumental in investigating mechanisms of change that are specific to individuals and in guiding patient-tailored feedback tools (e.g., Lutz, Rubel, Schwartz, Schilling, & Deisenhofer, 2019). Given the increased strength in computability, the results obtained through the new approaches are instantly available in many cases, which opens up additional possibilities for using such results and insights within the session. Live feedback based on such approaches is currently feasible and has great potential in the training of therapists and counselors. Integrating these approaches with existing tools may mitigate some of their potential disadvantages, such as a reduction in the richness of the therapeutic processes because of limits on the type of data collected, the loss of personal touch, impaired objectivity of decisions made while collecting and analyzing the data, the unavoidable effects of noise, the introduction of undesirable implications that are present regardless of whether or not steps to eliminate noise have been taken, and more.

The "Innovative Approaches to Exploring Processes of Change in Counseling Psychology" special issue celebrates the emergence of new approaches to counseling and psychotherapy research and the renewed interest in them. Each article serves as a sourcebook for applying a given innovative approach in counseling psychology research. The articles include a conceptual introduction of the approach in question and its potential benefits for understanding processes of change in psychotherapy and counseling psychology, as well as a brief overview of the relevant literature and current implementations of the approach in counseling research. Each article also includes a description of the tools and concrete guidelines used in the application of the approach, using actual data, as well as a brief annotated list of relevant software products, websites, and so forth. To illustrate the clinical potential of each approach, each article provides a demonstration of the clinical utility of the approach, including brief case reports, vignettes, and other relevant material that can make the approach come to life. The contributions end with practical suggestions on how and under what circumstances it is possible to apply the approach, how to avoid common pitfalls or problems in applying the approach and interpreting the findings, and open questions and directions for future research that have the potential to advance the field. Researchers from several countries contributed to the special issue, including the United States, Germany, the United Kingdom, Swit-

zerland, Italy, Belgium, and Israel, representing a variety of research and clinical orientations.

The approaches presented in the special issue differ in the types of questions they may help answer, what they are able to capture, their ease of use and the equipment required, the type of data they produce, their level of temporal and spatial resolution, their specificity and sensitivity, and more. Given the diversity of these approaches, with each having its own advantages and disadvantages, we believe that assembling a list of guidelines detailing the main characteristics of each approach would be valuable in choosing the approaches relevant to given types of research questions. Such guidelines have been previously described and categorized (see, e.g., Elliott, 1991; Hardy & Llewelyn, 2015). We have taken the liberty of organizing the articles in this special issue in a way that we thought would be of value to practitioners, by specifying the type of information that each approach can produce to support evidence-based practice. Given the nature of the articles assembled in this issue, the focus is mainly on quantitative approaches to psychotherapy process research (see, e.g., Gelo & Manzo, 2015). The following list of guidelines (see Table 1) is a preliminary attempt, which we hope researchers in the field will continue to expand. The list is not exhaustive, and some of the features may overlap. Most of the guidelines may be regarded as situated on a continuum, rather than representing binary options.

Perspective: Whose Perspective Is the Focus of Investigation?

Traditionally, the perspective of the investigation determines whether the therapeutic process is assessed from the vantage point of the patient/client, counselor, therapist, supervisor, or observer (Elliott, 1991). This tradition is represented in several articles of the present collection (Hilpert et al., 2020). In addition, we would like to emphasize other perspectives, such as technology-based (Schwartzman, 2020), biology-based (Zilcha-Mano, Shamay-Tsoory, Dolev-Amit, Zagoory-Sharon, & Feldman, 2020), and software-based (Aafjes-van Doorn & Porcerelli, 2020) perspectives. Several of the articles combine multiple perspectives (Goldberg et al., 2020).

Who and What Are the Focus of the Study?

When researchers are interested in studying a phenomenon, they need to decide what the object of their research is. First, they need to decide whether the basic unit of interest is the individual, two or more individuals who influence each other, a dyad, or a group. Second, researchers need to decide whether they wish to focus on only one such unit of interest (adopting idiographic methods) or to aggregate across several such units (nomothetic methods). Third, researchers need to decide whether they are interested in capturing a single snapshot of the unit of interest, understanding it as a trait-like characteristic of the individual, or several observations of it over time, unraveling the process of state-like changes in the unit of interest. In addition to these basic decisions, combinations of the guidelines listed previously are also possible.

Focusing on One Person Versus Two Persons Versus Dyadic or Group Level

The focus of investigation can be on one of the individuals in counseling or treatment, on the interdependence between two or more partners of the therapeutic relationships, or on the dyadic or group level. Does the therapy room contain two people who are expected to constantly influence each other through their work together (Safran & Muran, 2000)? Or alternatively, should the unit of interest be the dyad (the dyad as the unit of interest may reveal more critical information than the patient alone as the unit of analysis; Winnicott, 1964): the degree to which the patient and therapist are synchronized, or how much they agree or disagree on the phenomenon of interest? This distinction is not trivial because

Table 1
Preliminary List of Guidelines for Guiding Researchers and Practitioners Implementing New Approaches in the Study of the Process of Therapeutic Change

Feature	Focus of the approach
1. Perspective: Whose perspective is the focus of investigation?	• Human based vs. technology based vs. software based
2. Who and what are the focus of the study?	• One person vs. two persons vs. dyadic or group level • Idiographic vs. nomothetic phenomena • Trait-like vs. state-like characteristics
3. What are the purposes of the study?	• Validation of an existing conceptual model vs. the search for new/complementary insights • The new approach as the predictor vs. the product • Focus on emotion vs. behavior vs. cognition • Focus on conscious (declarative) vs. unconscious (implicit) processes
4. Types of data collection	• The ability to use already-collected (archival) data vs. the need for prospective data collection • Macro- vs. microanalysis: treatment level vs. session level vs. segment level • More vs. less invasive • More vs. less effort invested in implementing the approaches • Use of single-mode vs. multimodal approach
5. Methods of data analysis	• Qualitative vs. quantitative analyses

some of the phenomena assessed with the novel approaches presented in this issue do manifest only when more than one subject has been assessed (e.g., matching of language style).

The focus of inquiry may be on *one* of the partners of the therapeutic dyad, triad, or group in counseling or therapy. Researchers may focus on the physiological or acoustic characteristics of either the patients or the therapists or may process the language of one of them. The same is true regarding other measures that make it possible to observe the motion of one of the partners of the interaction, measure hormonal change in one of them, or use an event-related potential (ERP) task with one of them.

Another possibility is to address the partners of the therapeutic or counseling dyad, triad, or group as two or more units that influence each other, focusing on the interdependence between them. Researchers may track how hormonal changes in the patient influence and are influenced by hormonal changes in the therapist. Such interdependence can be observed while focusing on the patient's and therapist's acoustic parameters, such as the fundamental frequency of the speaker (F0) or heart-rate variability. Yet another possibility is to focus on the level of the dyad (or even the triad or group in counseling or therapy), where two or more individuals are no longer separate units of analysis that influence one another but, instead, are both part of the same unit. In this case, the focus can be on their level of synchrony or the level of agreement/disagreement between them. The different foci of interest necessitate different types of analysis and involve different types of challenges (e.g., Kivlighan, 2007; Marmarosh & Kivlighan, 2012). For example, as noted by Ramseyer (2020) and by Kleinbub, Talia, and Palmieri (2020), when studying synchrony between the two partners of the counseling dyad, researchers need to choose between different ways of calculating synchrony and to control for random pseudo-synchrony that may occur independently from the two partners' interaction.

Some approaches have the potential to focus on each of the three options just described, whereas others are restricted to one or two of them. For example, in this special issue, Ramseyer (2020) provides a primer on the assessment of motion synchrony between patients and therapists from videos of the therapy sessions. By definition, motion synchrony focuses on the dyad level and cannot be separated into therapist and patient levels. Similarly, Aafjes-van Doorn and Porcerelli (2020), also in this special issue, focus on language style matching (LSM), namely, the degree of similarity in the rates of function words in dyadic interactions. LSM also uses the dyadic level as the unit of analysis.

Hormones and physiology, by contrast, can be assessed by focusing on the individual patient or therapist, their interdependence, or their level of synchrony. Zilcha-Mano, Shamay-Tsoory, et al. (2020), in this special issue, demonstrate how changes in oxytocin in the patient and therapist can be referred to while using the patient, the therapist, or the dyad as the unit of interest and referring to the level of synchrony between the patient and therapist. Physiology can also be assessed on all three levels. In this special issue, Deits-Lebehn, Baucom, Crenshaw, Smith, and Baucom (2020) provide practical guidelines for physiological monitoring of each individual (therapist, patient) and demonstrate how physiological measures can be incorporated into couple treatment. Their research addresses the interdependence between patient and therapist and shows how the therapeutic presence of the therapist may affect patient parasympathetic (i.e., heart-rate variability) and sympathetic (i.e., electrodermal activity) functioning. Yet they use the average value of the physiological data, representing the physiology of the couple, and refer to the couple as the unit of analyses. By contrast, Kleinbub et al. (2020), also in this special issue, focus on physiological synchronization between patient and therapist, in which the level of analysis is the therapeutic dyad. They demonstrate their approach through the investigation of the association between secure attachment markers, therapist attunement, and patient–therapist skin-conductance synchronization. Covering the ground in between, Hilpert et al. (2020) assess the emotion of patients and therapists separately, but they provide statistical tools that allow for quantification of the dynamics emerging in the dyad.

The examples in this special issue demonstrate the many options available to researchers working with such data and the importance of making deliberate decisions before the start of the study regarding the nature of the phenomenon under examination: Does it focus on the individual as the unit of interest, on two or more individuals and the interdependence between them, or on the dyad or a group, exploring the level of agreement and disagreement between them or their mutual temporal coordination?

Studying Idiographic Versus Nomothetic Phenomena

After choosing a level of focus, researchers also need to choose whether they seek to characterize idiographic or nomothetic phenomena (Allport, 1946; Cone, 1986). Nomothetic methods (from the Greek word *nomothetes*, meaning "lawgiver") seek to study that which is common to individuals in general or to groups of individuals. Analytic methods, such as statistical inference models, can be used to reach nomothetic conclusions. By contrast, idiographic methods (from the Greek word *idios*, meaning "one's own") focus on the individual, and in counseling and psychotherapy, they seek to shed light on the individual's process of change during treatment. In idiographic research, both qualitative and individual-level time-series analysis can be used to explore relationships between variables within one individual over the course of counseling or psychotherapy (Piccirillo & Rodebaugh, 2019). The decision of whether to use one or the other is important because studies suggest that it may not be possible to generalize findings from one to the other (Fisher, Reeves, Lawyer, Medaglia, & Rubel, 2017; Fisher, Medaglia, & Jeronimus, 2018; Ramseyer, 2019).

Some of the articles in the special issue use idiographic, dyad-centered methods, whereas others use nomothetic methods that aggregate data across individuals. For example, Lutz et al. (2020) apply nomothetic methods to search for groups of individuals showing similar early development in interpersonal problems and examine whether these groups can be predicted based on the motion synchrony between patient and therapist. By contrast, Kleinbub et al. (2020), also in this special issue, focus on moment-by-moment physiological synchronization. Lutz et al. seek to generalize the findings to the individuals participating in their study, as well as to those who did not participate, whereas Kleinbub et al. describe changes specific to the selected dyad alone.

We see great merit in the development of advanced means for using idiographic and nomothetic methods and for integrating the two. For example, by adopting advanced idiographic methods, it is possible to integrate some of the new approaches presented in this

special issue with ecological momentary assessment using smartphone technology, open-access software for analyzing time-series data, and advanced statistical methods. Together, these can be applied in an instructive exploration of questions such as how the individual's trajectories of change in symptoms and emotion regulation at baseline, in the weeks before treatment began (trait-like trajectories of change), do or do not show state-like changes after treatment begins and whether similar trajectories are evident within versus between the treatment sessions.

Emphasizing Trait-Like Versus State-Like Characteristics

The approaches described in the special issue can be used to measure trait-like characteristics of the individual and to compare individual patients, individual therapists, or both, based on their properties on a given measure. The approach can also be used to measure state-like changes occurring within individuals (Zilcha-Mano, 2016, 2017, 2019). When the focus of the study is on trait-like individual differences between patients or between therapists, the scores of each individual can be extracted and compared with those of others. Individuals may differ in their general level of oxytocin or cortisol; in their typical levels on physiological measures, such as skin conductance and heart-rate variability; or in their typical acoustic characteristics, for example, F0 or jitter. Such trait-like measures can be assessed before the start of counseling or psychotherapy to assist in treatment selection when such trait-like markers can serve as moderators of the effect of the type of treatment on outcome.

When the focus of the study is on state-like changes occurring within individuals, researchers need to conduct several observations over time for each individual to track the changes that occur in the measures in the course of treatment. State-like measures can be used to assess many types of processes of change over the treatment. One example is the use of changes in motion synchrony between patient and therapist as potential mediators of the effect of the individuals' (patient, therapist, or both) baseline ability to create synchronized behavior with others on treatment outcome. In this case, researchers need to assess motion synchrony in several sessions during treatment because one assessment is not sufficient for capturing state-like changes. When only one assessment is made, it is not possible to disentangle state-like processes that occur during the course of treatment (e.g., changes in the dyad motion synchrony as it develops from one session to the next) from general trait-like tendencies of the individual or the dyad (e.g., the general tendency of the individual to be synchronized in motion with others or the general tendency of the dyad to show motion synchrony). Another example is the ability of the synchrony between patients and therapists in oxytocin released during the sessions to act as a mediator of the effect of the patient's interpersonal deficits on treatment outcome (Zilcha-Mano, Goldstein, Dolev, & Shamay-Tsoory, 2020). Here again, to capture state-like changes in oxytocin, it is necessary to assess oxytocin changes from pre- to postsession for several sessions over the course of treatment. Yet another example is the identification of subpopulations of patients showing distinct trajectories of change in F0.

It is of critical importance to determine, before designing the study, whether the focus of investigation is on trait-like differences between individuals in the construct of interest or state-like changes that occur over time. This decision determines whether assessment conducted at one point in time is adequate for accomplishing the aims of the study or whether repeated assessments are needed. It is not uncommon for researchers to use findings based on a single assessment in examining processes of change, although methodological articles have repeatedly argued that there are risks in using trait-like assessment (between-individuals variance) to make inferences about state-like changes (within-individual variance; e.g., Curran & Bauer, 2011; Wang & Maxwell, 2015).

What Are the Purposes of the Study?

After deciding who and what are the focus of the study, researchers must make decisions about the objectives of their investigation. Do they have a conceptual model that they are interested in validating, or do they want to discover new insights through open exploration? Do they want to use the approach to better understand other constructs in counseling and psychotherapy (e.g., the therapeutic alliance), or is understanding the products of the approach the aim of their research (e.g., what makes two individuals working together to improve the well-being of one of them become synchronized in the sounds they produce, the hormones they release, and their motion)? Is the main aim of the investigation to understand emotion, behavior, or cognition? Do they aim at testing a phenomenon of which the individual is aware, or is the focus of the investigation outside of direct and deliberate self-observation (or even observation by others)?

Validation of an Existing Conceptual Model Versus Search for New/Complementary Insights

A theory-driven investigation is generally based on a theoretical model and has specific aims and hypotheses. Studies of this type seek to validate a conceptual model. By contrast, data-driven methods of investigation use techniques and models derived from many disciplines, including mathematics, statistics, computer science, and information science, to learn about a given phenomenon. Data-driven methods let the data answer the research questions, rather than validate a theory or conceptual model, and expect to generate new insights through exploratory investigation.

It is possible to refer to a continuum, in which the theory-driven component is predominant at one extremity, and the data-driven component predominates at the other. At one end of the continuum, Schwartzman (2020) assess whether wearing a sociometric badge influences natural conversations and provide examples of possible future investigations of social signals relevant for clinical settings. Hilpert et al. (2020) apply general models to individual dyads to extract signatures of dynamics relevant at the idiographic level, which may then be aggregated into larger groups for a more nomothetically oriented generalization. Other examples include the study of theory-driven mediation models, where the approach in focus can serve to assess the mediators, predictors, or outcome.

At the other end of the continuum, Goldberg et al. (2020) use data-driven machine-leaning approaches to explore the ability of natural-language processing to predict the therapeutic alliance. The authors used recordings from 1,235 sessions of 386 patients seen by 40 therapists and processed them using automatic speech-recognition software. As demonstrated in the article, the machine-learning algorithm discovered associations between client ratings

of therapeutic alliance, based exclusively on the linguistic content of the sessions. Around the middle of the continuum, Lutz et al. (2020) use cluster analysis to identify distinct clusters of early change in interpersonal problems in a sample of 212 patients who underwent cognitive–behavioral treatment. Next, they explore potential connections between motion synchrony and the three clusters of early change in the interpersonal problems they identified. They reveal that lower levels of early motion synchrony are significantly related to fast improvement in patterns of interpersonal change.

We see great merit in research at each point along the continuum between theory-driven and data-driven methods, as long as the methods used are consistent with the type of questions asked. Advances in statistical analysis methods make both extremities highly desirable foci of empirical investigations. In the past, conceptual models had to be kept simple to be suitable for empirical investigation and therefore demanded that the richness and complexity of the therapeutic processes be reduced. At present, using structural equation modeling and other analytic methods, researchers are able to test rich, sophisticated, and complex theoretical models. At the same time, advances in data-driven approaches, such as the implementation of machine-learning algorithms, provide new and promising methods of exploration that, when correctly implemented, are less prone to overfitting.

The New Approach as the Predictor Versus the Product

The focus of the investigation may be the values themselves, produced by applying the approach. In this case, the efforts are invested in predicting these values, in an attempt to learn about the origins of the baseline trait-like levels pertinent to these values, their levels at given points in the treatment, or their trajectories of change. Alternatively, the values produced by the implementation of the approach can serve as predictors of other important variables in treatment, including outcome and process variables. In the latter case, the approach is used to predict specific levels or changes in process variables, such as alliance, during treatment, or changes in session or treatment outcome (Aafjes-van Doorn & Porcerelli, 2020; Ramseyer & Tschacher, 2011). In Lutz et al.'s (2020) article, motion synchrony serves to predict clusters of early change in interpersonal problems. Similarly, in Deits-Lebehn et al.'s (2020) article, the levels of High-frequency heart rate variability are used to predict therapeutic presence; in Goldberg et al.'s (2020) article, the natural-language-processing approach is used to predict the alliance, as reported by the patient; and in Aafjes-van Doorn and Porcerelli's (2020) article, LSM is used to predict the observer rating of the working alliance. When it is used to assess mediators, the approach can serve to measure both the predictor and the product.

The approach can also be the focus of investigation based on its use as a monitoring tool to provide both interindividual trait-like information and intraindividual state-like information. Specifically, the approach may serve to learn about baseline trait-like characteristics of the individual, with the aim of selecting the most appropriate therapeutic techniques for the patient (treatment selection). The values produced by the implementation of the approach may be used over the course of treatment to monitor state-like changes and learn about the progress of treatment. The information regarding state-like changes can then be used to custom-tailor the techniques implemented in treatment for the individual patient. Applying novel technology in a simulated psychotherapeutic dialogue setting, Schwartzman (2020) assess how a sensing device may affect the quality of the interpersonal relationship and of the conversation dynamics and provide a first glimpse into possible clinical applications. In their clinical example, Matsen, Perrone-McGovern, and Marmarosh (2020) suggest that ERPs can be used to measure how the patient responds to negative stimuli, empathy, and positive self-talk while being monitored. In this way, clinicians can obtain information about how the patient responds to a threat and how quickly the patient can cope with negative stimulation. This information can help guide treatment as the therapist applies emotion-regulating strategies with the patient. Zilcha-Mano, Shamay-Tsoory, et al. (2020) provide evidence of how the repeated assessment of endocrinological factors, such as the salivary concentration of oxytocin, may inform about both phenomena arising in the dyad and aspects related only to the patient or the therapist. This type of research may inspire the development of biologically driven, evidence-based feedback for therapists.

Future studies may seek to delve into the question of whether and when the new approach is expected to capture the exact same phenomena it is trying to capture (e.g., the approach = the therapeutic relationship) or specific aspects of it (e.g., the approach = real relationship vs. working alliance vs. therapeutic presence vs. explicit aspects of the alliance, etc.), when it is expected to capture individual differences in the phenomena between patients and/or therapists (e.g., the approach = trait-like differences between individuals in their ability to form strong alliance), and when it is expected to capture changes occurring in the phenomena within individuals (e.g., the approach = state-like changes occurring over the course of treatment).

Focus on Emotion Versus Behavior Versus Cognition

The focus of the investigation may be the emotions or arousal of patient or therapist, or both. Alternatively, the investigation can focus on the behaviors or changes in the motion of each individual (patient or/and therapist) or their synchrony. It may also focus on the patient's cognition and the way it may change in the course of treatment. Hilpert et al. (2020) focus on the patient's and therapist's emotional states within each session. Aafjes-van Doorn and Porcerelli (2020) provide insights into processes occurring at the level of language use, and Matsen et al. (2020) suggest that ERPs can be used to measure how well patients tolerate emotions and recover from emotional stimulation. Ramseyer (2020) and Lutz et al. (2020) demonstrate the importance of focusing on the patient's and therapist's behavior and on the extent to which they are synchronized in their movement dynamics.

Future work is needed to further specify the exact elements that the investigators implementing the approach are seeking to capture. Such specification may prevent inconsistencies resulting from different studies using identical terms but referring to different stages or aspects of the phenomenon under investigation. Such specification may also be useful in closing the gap between basic and applied science and facilitating the use of a common language. For example, when one focuses on emotion, or specifically on emotion regulation, it is important to indicate which elements of emotion or emotion regulation are being addressed. One may

emphasize the stage of selecting an appropriate regulation strategy, the implementation of the chosen strategy, or monitoring that implementation (Sheppes, 2019). Investigators should also specify whether the emotion regulation strategies they study refer to cognitive regulation by disengagement (e.g., emotional distraction) or by engagement (e.g., reappraisal; Parkinson & Totterdell, 1999). The two may involve the recruitment of differential executive-control mechanisms, which modify emotional information processing at two central sequential cognitive stages: attentional selection and semantic meaning (Sheppes, 2019). Even when the approach implemented by the investigators is not sufficiently specific and sensitive to enable differentiating between the various types, it may be important for investigators to be explicit in their conceptual models and enable in-depth understanding, which is necessary when confronting inconsistencies between the findings of different studies. Future conceptual models may also specify how cognitions, emotions, and behaviors may be intertwined in the phenomena under study. For example, cognitions are important for the selection of emotion regulation strategies.

Focus on Conscious (Declarative) Versus Unconscious (Implicit) Processes

Some of the approaches focus on what an individual can observe and report upon when asked during or after the treatment session. Others may concentrate on elements outside direct and deliberate observation, which are implicit, effortless, and automatic in nature. The different approaches may be able to capture distinct phenomena or aspects within each phenomenon, situated at different points on the continuum between more conscious or declarative versus less conscious experiences. As clarified by Aafjes-van Doorn and Porcerelli (2020), it is important to distinguish the term *unconscious* in its current use from its use in the psychoanalytic literature, where it refers to repressed material, often related to primitive drives or instincts in the patient's mental life. Our use of the concept in the current context refers to automatic, less controlled behaviors.

The approach presented in the article by Hilpert et al. (2020) uses the rating slider to code emotional experience, with emphasis on conscious materials that patients and therapists can observe and report on. With the aim of not disturbing the natural flow of the interaction, patients and therapists are asked to rate their subjective experience of emotions during therapy sessions based on watching the recordings of their sessions after they are over. Most of the other approaches focus on aspects of experience that are not available for direct observation. For example, Aafjes-van Doorn and Porcerelli (in press) examine LSM, that is, the degree of similarity in the rates of function words (e.g., pronouns, prepositions, and conjunctions) in dyadic interactions, which may reside outside of conscious awareness. Similarly, Ramseyer (2020) suggests that the coordination of movement dynamics usually occurs outside the explicit control of both patient and therapist.

Types of Data Collection

After deciding who and what are the focus of analysis and what the aims of the study are, researchers can start addressing the type of data to be collected. Can they use archival data that were already collected for other needs, setting new aims and exploring the data under a new angle, or does the approach require the prospective collection of new data? What is the resolution at which data should be collected (macro- vs. microanalysis)? How invasive is the data collection? And is one approach sufficient to achieve the aims of the study, or should several approaches be integrated?

The Ability to Use Already Collected (Archival) Data Versus the Need for Prospective Data Collection

Some of the approaches can be applied to data that have already been collected. Readers of this special issue who have access to archival data may be able to use the guidelines specified in these articles (potentially as part of a collaborative work with experts in the given approach) to implement the new approach using their data. For example, Ramseyer (2020) describes how to implement motion energy analysis on already-collected videotaped sessions. This approach was used by Lutz et al. (2020) on archival data to explore the association between patient–therapist motion synchrony and change in interpersonal problems. The study by Goldberg et al. (2020) is another example of how data that are already available may be used for further analysis with novel methods, such as machine learning.

Other approaches, on the opposite side of the continuum, can be used only in prospective studies. For example, Matsen et al. (2020) provide a sourcebook on how ERPs can be used to explore processes of change in counseling psychology. Similarly, as described by Deits-Lebehn et al. (2020) and Kleinbub et al. (2020), to incorporate physiology into the study of psychotherapy and counseling research, data must be collected prospectively, with patients and therapists connected to the relevant devices. Prospective studies are also needed when the approach of interest is based on the collection of behavioral data using a wearable device, as described by Schwartzman (2020). Around the middle of the continuum are studies, like the one by Hilpert et al. (2020), that, on the one hand, use videotaped sessions but, on the other hand, require patients and therapists to code the sessions and rate their emotions from moment to moment during the course of the session.

Macro- Versus Microanalysis: Treatment Level Versus Session Level Versus Segment Level

Another important decision to make regarding the type of data to be collected is whether the unit of analysis should be the treatment level, the session level, or a segment within a session. Some processes in psychotherapy are conceptualized as taking a long time, and changes are expected to consolidate during relatively extended periods of time, such as, for example, changes in general attachment orientations (Bowlby, 1988) or defense mechanisms (Perry & Bond, 2005). Other processes are expected to evolve quite quickly, from one moment to the next, in the course of a session. In their book, Safran and Muran (2000) describe how changes in alliance may occur continually in each session of treatment, and not necessarily in a linear development. Some of the approaches are able to automatically capture changes that occur from one moment to the next of the therapeutic process. Approaches focusing on motion (Lutz et al., 2020; Ramseyer, 2020), physiology (Deits-Lebehn et al., 2020; Kleinbub et al., 2020), acoustics (Wieder & Wiltshire, 2020), linguistics (Goldberg et al., 2020), and a combination of signals (Schwartzman, 2020) are able

to describe automatically, and with relatively little effort, the process of change from one moment to the next during each session, over the entire course of treatment. This provides an exciting opportunity for counseling and psychotherapy research exploring the process of change at the macro- and microlevels.

Researchers should determine the time frame in which the phenomenon under investigation is expected to change, using both conceptual models and empirical tools to help make that determination. In addition to determining the time frame in which the phenomenon under investigation is expected to show changes in the course of treatment, another important question concerns the time frame in which such changes may affect other process and outcome variables. The first question refers to measurement: How often should we measure the phenomenon we are focusing on? The second question refers to the statistical models to be used: How long should the lag be between the predictor and the product (Granger, 1969)?

More Versus Less Invasive

Approaches that are based on videotaped sessions (e.g., motion analyses, acoustic analysis when no specific equipment [e.g., head-worn microphones rather than portable digital recorder] is used) are the least invasive ones. At the other end of the continuum are approaches that use more intrusive methods, like functional magnetic resonance imaging (fMRI) or ERP (Matsen et al., 2020). In the middle are approaches that require participants to wear some equipment but are not excessively intrusive in nature, such as the use of smart bands and similar assessment devices (Schwartzman, 2020). In some research and clinical settings, it may be feasible to collect more invasive data, but in others, this may not be the case.

More Versus Less Effort Invested in Implementing the Approaches

Although the approaches are commonly referred to as automatic, they differ in the amount of effort needed to extract the required data. The efforts can be divided into those invested in setting up the infrastructure needed to use the approach, those invested in acquiring the data, and those invested in analyzing the data. The approaches also differ in the amount of human decision-making involved in quality checking and extracting the data.

As detailed by Ramseyer (2020), motion synchrony is one of the simplest methods; it requires no special detectors, devices, or markers on patients or therapists. It is based on the assessment of differences in sequences of pictures (frames) in video recordings. At the other end of the continuum, the ERP approach requires setting up the required infrastructure before the start of the study and choosing the appropriate task, as well as a set of procedures repeated for each individual, including attaching electrodes to the scalp to detect and record shifts in the electric potential. A data-processing stage is needed to clean the noise and prepare the data for analysis (see the detailed protocol provided by Matsen et al., 2020).

Use of Single-Mode Versus Multimodal Approach

As is clearly evident from this list of guidelines, each approach has its advantages and disadvantages. Yet often, the approaches may complement one another, making it possible to benefit from the advantages of each and mitigate their respective weaknesses. Integration may be accomplished within distinct measures applied within the same approach or between different approaches. For example, as specified by Deits-Lebehn et al. (2020) and Kleinbub et al. (2020), as part of the physiological approach, different measures can be used, and they can also be integrated, such as, for example, measures of the autonomic nervous system (skin conductance and heart-rate variability) and facial myography (facial microexpressions).

The integration of different approaches may be particularly important for addressing issues of sensitivity and specificity. An increase in the values assessed by one approach, such as F0 or oxytocin, may indicate a corresponding increase in arousal, which may signify a beneficial or adverse process occurring in treatment. For example, an increase in oxytocin can be a marker of an important process occurring in the therapeutic alliance between the patient and the therapist. Such an event can be a deep, corrective experience in the form of repair of an alliance rupture, where the therapist is able to validate the patient's hurtful experiences, acknowledge them, and assume responsibility for part of them—sometimes being the first one to do so in the patient's life. The important process, however, may also be a significant rupture between the patient and therapist. This type of possible association has been previously suggested in other fields of science, outside of psychotherapy research (Shamay-Tsoory & Abu-Akel, 2016). In other words, an increase in oxytocin may be indicative of both meaningful positive and negative processes occurring between the patient and the therapist (Zilcha-Mano, Porat, Dolev, & Shamay-Tsoory, 2018). To verify whether the direction of this meaningful change is positive or negative, other approaches may be used, for example, observer ratings of rupture resolution, which can shed light on the process taking place and its value (Eubanks et al., 2018). A rating slider may also be used to continuously assess the subjective experience of patient and therapist emotions during sessions (Hilpert et al., 2020).

Methods of Data Analysis

For many years, counseling and psychotherapy research relied predominantly on quantitative approaches. In the last 2 decades, however, researchers have become increasingly aware of the great merit that qualitative approaches have to offer for understanding processes and outcomes in counseling and psychotherapy (Lutz & Hill, 2009). The data gained from each one of the approaches presented in this special issue have the potential to be analyzed using qualitative or quantitative methods, or a combination of the two.

All the articles included in this special issue used some sort of quantitative measure and demonstrated its use, either with exemplary samples or with larger databases. Some approaches integrated quantitative aspects with thematic analyses of case reports, as demonstrated by Kleinbub et al. (2020). We hope that future studies will implement systematic qualitative methods in their investigations of these approaches. Some of the methods that may be of special interest are task analysis (Greenberg, 2007) and consensual qualitative research (Hill et al., 2005).

Summary

Decades of research in counseling and psychotherapy have produced a wealth of results that enabled the field to make tremendous progress. The wide array of methods and findings attests to our having come a long way since the time when researchers first started to systematically assess counseling outcomes and processes. Many of these important findings depend heavily on methodologies involving such tools as self-report measures, which have both clear benefits and serious shortcomings. Among others, they include the effects of the ability, awareness, and motivation to report on some of the processes. Sophisticated coding systems have been developed to complement self-report measures, with the added benefit of providing a more objective perspective, but at the cost of being expensive and labor intensive. These obstacles may be especially problematic when researchers wish to investigate therapeutic and other inter- and intrapersonal processes as they unfold over time, between and within sessions.

In the last few years, with the search for objective, valid, and economical methods, new approaches have been introduced for capturing the richness of therapeutic and other intra- and interpersonal processes, many of which are interdisciplinary in nature. These approaches include, among others, nonverbal aspects such as acoustics and kinetics; affective, hormonal, and physiological measures; and more. Because these approaches rely on knowledge from other disciplines, which has been imported into the field of counseling research only recently, little systematic work has been done on the unique issues that arise in the process of integrating these methods in our field. The aim of the articles in this special issue is to serve as an initial guide for those wishing to learn more about these research methods, for practitioners interested in acquiring background knowledge to assimilate this developing literature, and for researchers who intend to contribute systematically to the advancement of the field. The issue seeks to serve as a sourcebook for applying innovative approaches in counseling psychology research.

We are enthusiastic about the articles presented in this special issue and envision this collection as a valuable resource, to be used in any field of counseling psychology. The clinical demonstrations provided in each one the articles show the growing seeds of the potential change brought about by the implementation of new approaches in counseling and psychotherapy research and the benefits of integrating them with existing tools. Over decades of psychotherapy research, empirical investigation has struggled to measure many critical therapeutic processes. The integration of the new approaches with existing ones (e.g., self-report scales, interviews, coding systems) promises to capture, better than ever before, the richness of the process of therapeutic change. The selection of articles assembled in this special issue is clearly not exhaustive, and we are confident that many more possibilities await psychotherapy and counseling researchers in other fields, such as computer vision (Alameda-Pineda, Ricci, & Sebe, 2019), brain imaging (Liu, Li, Zhang, & Zhang, 2019), and biological/genetic markers (Halldorsdottir & Binder, 2017). We hope that this special issue sparks interest in implementing the presented approaches in many fields of counseling psychology and that the detailed primers can help apply these approaches. We are confident that the kind of process data accessible with the described approaches in this special issue have the potential to advance the knowledge and tools at our disposal in dealing with mental illnesses (Teachman et al., 2019) and to make patient-tailored navigation and feedback tools available to providers of mental health interventions (Lutz et al., 2019).

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