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Future of processing and facilitating change and learning

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Abstract

The field of the sciences of the mind is evolving fast. With the diversification of knowledge and accumulation of data, often lacking integration and reproducibility, questions arise. The role of critical thinking and research is evident. As the science of the unconscious, psychoanalysis provides a method and theory to understand human minds and mentalities, helping the patient know his mind and transform action into reflection. Mental activities, including social skills, develop in the social context, depending on the social environment's demands and resources put onto the individual. Encoding emotional signals, markers of meaning for the individual, is ontogenetically necessary and has influences on memory encoding. Beyond theoretical understanding, implicit relational knowledge is actualized in the therapeutic setting. With a strong focus on experiencing emotional reconsolidation of memories, previous relationships' repercussions are enriched with broadening viewpoints in the analytic environment. The long-term effects of psychotherapeutic treatments have been examined. A sufficient explanation of the specific factors contributing to success or an answer when an impact is lacking is still under investigation. When investigating subliminal and implicit mechanisms leading to memory reconsolidation and the formation of functional object relations and interaction patterns, the focus is set on affective interplay and processing prior/during and after social interactions. The present paper discusses which parameters might contribute to the reshaping of memories and the linkage of memory with the emotional load of experience. Providing insights into such dynamic mental phenomena could enhance process research by investigating moment by moment interactions in psychoanalysis, treatment, and learning processes. Due to the research subject's complexity, different research methods and integration of associated research fields are required.

Key Words: Psychoanalysis; Hermeneutic circle; Evidence-based medicine; Bias; Affective interplay; Micro-process

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Core Tip: The mind's ability to interact and assess the external world's reality and integrate new experiences into existing conceptions is determined by the affective load the respective interplay is assigned. Gaining a picture of the world at an acceptable reliability level requires a curious mind and openness for a discursive dispute with encountered findings.

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INTRODUCTION

"The only true wisdom is in knowing you know nothing." – Socrates.

The illusion of certainty is constantly eroded when the amplification of questions is generated by research. Nevertheless, integrating scientific findings following an interdisciplinary approach is as challenging as inspiring, even more when dealing with a presumably still unknowable research object like the human mind. Creating a scientific dialogue dedicated to integrating balanced evidence while still constantly questioning results for their probability towards an approximation to truths requires openness to innovation. This dialogue leads to an integration of different perspectives; all concerned with overlapping research topics.

THE CIRCLE OF UNDERSTANDING

Being in the world involves acquiring experience, knowledge, and assumptions. Only from the observer's background, it is possible to enter a circle of understanding and re-experience in practice the hermeneutic circle. Developing a sense of the whole means acquiring a better sense of each part – the interpretation of findings depends on the conceptions and vice versa.

Psychodynamic theorizing and therapeutic work explore the unconscious elements not intelligible to conscious thinking but impacting our cognitive and affective abilities. Therapeutic work makes part of applied sciences to apply care based on up-to-date scientific findings continually. It contributes to research by generating a hypothesis and collecting data again, feeding back to research and quality control. "How do we know what we know" remains a sophisticated question, especially when it comes to 'implicit' and 'embodied' knowledge like social skills, relational knowledge, and interactional patterns.

Relevance to the daily routine and therapeutic work is evident as investigating mechanisms of change in this field determines patients' future options and the therapists' attitudes toward what she/he can influence. Generating meaning and giving value to one's life is something very individual and so are conceptions regarding the outcome. However, attachment to relevant others and life itself is often disturbed in mental disorders. Mental conditions confound and trouble emotional well-being and overall psychosocial functioning, with innumerable consequences on a person's path of life, catapulting them in an awkward position. Compassion fatigue marks the borders of empathy and resilience even of socially skilled and socially minded persons.

LEVELS OF EVIDENCE

To answer clinical questions and support clinical decision-making recommendations, evidence-based medicine should rely on the highest level of evidence available. Expert opinion and case reports are at the lowest level of evidence followed by case series. However, when it comes to the relevance of an individual case, this is not only determined by the incidence of the condition in question and thus by the possibility of carrying out extensive investigations (*e.g.*, in rare diseases). To follow a hypothesis-

generating approach, such study designs including qualitative methods (video- or text-analyses, interviews, *etc.*) can be of specific value and can be combined in a mixed-methods design to build a clinical theory - of course without claiming the stance of a scientific theory. Strong recommendations demand several adequately conducted randomized controlled trials and systematic reviews/meta-analyses on the research question. However, consistent evidence from lower-level studies (high-quality prospective cohort study with adequate power) and evidence from a lesser quality type of evidence with a predefined study design (*e.g.*, retrospective cohort study, a case-control study) support a strong recommendation[1]. The quality of possible findings in a meta-analysis depends on the quality of available evidence. Nevertheless, both approaches, a quantitative, natural scientific and a more qualitative, social scientific or even including the humanities, can be interesting for the research field of processing and facilitating change and learning, but we have to take the different levels of evidence into account.

Interpretation of knowledge from different levels of evidence can be challenging. However, when prioritizing information, the need for randomized controlled trials to improve evidence is relevant for psychodynamic theorizing. Confirmation[2] and publication bias[3] can only be avoided by reproduction of results in large systematic replication projects, transparency and completeness in reporting methods, data, and analysis in a scientific publication[4,5]. To avoid constructed consensus, Socrates developed the Socratic dialogue as a form of cooperative argumentative dialogue based on asking and answering questions to stimulate critical thinking[6]. Awareness of the complexity of investigations, of the questionability of truth and value of one's own opinions, leads to careful and in-depth thinking[6]. Popper's concept of critical rationalism as a method of inquiry claims that scientific theories should be criticized; a hypothesis must be subjected to tests that might falsify them[7,8]. Critical rationalists believe in progress without believing in the concept of truth in an absolute sense. However, in postmodernism, a diversity of voices is accepted as an acceptable endpoint of scientific research[8]. The human mind's ability to falsify hypotheses might be limited by its premises as its ability to generate them. Anti-positivists doubted the existence of facts. A problem-oriented, or even case-based, approach, instead of focusing on a method-oriented approach, has been claimed by both postmodernists and critical rationalists[8].

THE SCIENCE OF THE UNCONSCIOUS

In his search of the genesis of human knowledge and the role memory has in our having experience, Freud[9] concluded that plenty of human mental processes might happen unconsciously but influence behavior. In his everyday work, Freud[9] observed clinical phenomena and effects worth investigating further, thus facilitating subsequent research, with his theories also being subject to controversy. In his analysis of symptoms, he postulated that each of them makes sense when the mind's operations taking place below the conscious awareness level are considered (also compare[10]). Drives connected with basic needs (*i.e.* basic biological instincts) and societal demands posed to the individual by environments and context form human personalities, intrapsychic structures (ego, id, and super-ego), and mental abilities. Social and human science methodologists developed a multitude of research strategies, termed 'qualitative'. With Lacan[11], among other psychoanalytic theoretical developments, psychoanalytical science became a symbolization process and a way of obliterating and dissolving the phenomena of life. The imaginary realm (*e.g.*, images, shapes) is transformed in the symbolical realm of scientific experience (*e.g.*, measurement, numbers, formulae, methodological standards)[12] (Figure 1).

Contemporary views on whether research has a role in justifying and developing psychoanalytic theory and the limitations of research in this field root in a controversy with a long history[13]. Psychiatry, conceptualized as applied clinical neuroscience, had been focusing on pharmacotherapy in the 1990s. In contrast, integrating the psychoanalytic method into other psychological methods and establishing a research culture had been missed[14].

Nevertheless, clinical observations were invaluable to all known thinkers in this field. Repeated interactions with the caregiver and relevant others in early childhood shape how reality is experienced and perceived. Those affectively loaded and lived experiences result in implicit knowledge and assumptions and determine later behavior (*i.e.* patterns)[15]. That is why infant research has a long history within psychoanalysis[16-20].

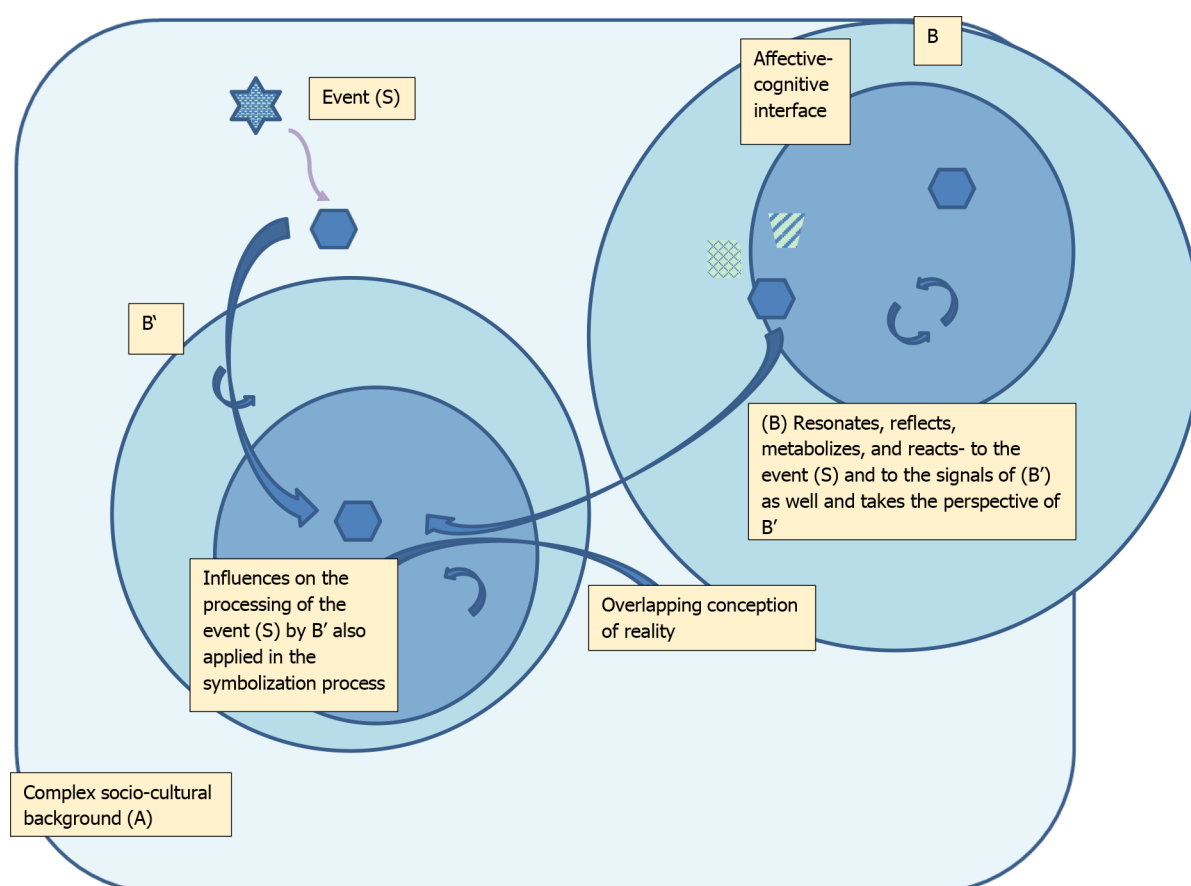


Figure 1 Symbolization process. Within a more complex sociocultural background (A), two individuals meet (B, B'). Something (S) affects them both in their (shared conception of) reality. An individual's behavior and inner states and reaction to this stimulus depend on its own symbolization abilities and experiencing. This processing evolves in tight interrelation with others and happens on a somatic and a cognitive layer. The relevant other (B) resonates, reflects, metabolizes, and reacts to the event (S) and to the signals of (B') as well and takes the perspective of B'. This reaction again influences the processing of the event (S) by B', also applied in the symbolization process.

PSYCHOTHERAPY RESEARCH

Adaptation to reality is one of the principal goals in psychoanalytic therapy, with reality as the derivation point of unconscious fantasies[9] exposed by the therapeutic work. Psychodynamic work considers subliminal signals (*i.e.* enacted through language, gesture, facial expressions) and latent perceptions of those stimuli. Importance of unconscious and embodied knowledge in the processing of such perceptions applies. Psychodynamic interventions aim at reshaping cognitive processing (*e.g.*, perception, attention, and memory)[21] by creating new viewpoints and experiences in the (analytic) environment.

Several high-quality studies reviewed in an updated meta-analysis have shown the efficacy of short-term psychodynamic therapy for depression and its equivalence with other psychotherapies[22-24]. However, several reviews with very high effect sizes had to be excluded from this analysis due to their statistical methodology. Long-term psychoanalytic therapy effectiveness is supported by evidence from systematic reviews of empirical studies[25]. Regardless of these findings, concerns about the consistency of the research methodology have been raised. Due to the lack of meta-analyses reviewing robust, high-quality data, high-level evidence is missing[25]. Overall, identifying predictors for long-term effects would help yield hope for individual patients and allocate treatments. Nowadays, health care providers demand the highest achievable evidence when deciding upon the allocation of resources. When confronting the efficacy of cognitive-behavioral therapy and psychodynamic therapy in treating major depression, the two methods applied in the randomized controlled trials showed no significant differences but were equally effective[23]. However, when long-lasting effects (3 years) were investigated, psychoanalytic therapy was better, possibly due to a dose effect[26]. Additionally, mediators predicting treatment success specific for each treatment method have been proposed[27-31]. Investigating dreams and patients' fantasies and focusing on memories or reconstructions of childhood were

found to explain some of the differences between the two methods.

When creating common ground in psychotherapy research, this involves many therapeutic approaches, claiming to have the recipe for healing the human psyche. One of the characteristic traits of humans, most probably distinguishing them from other primates, is their ability to form societies and carry on negotiations between different groups within individual societies and at an international level. The ability to hypothesize and adopt different perspectives to understand other viewpoints (*i.e.* mentalizing) is necessary.

As to psychotherapy research, given that many different approaches lead to improved symptoms, common factor models (including alliance, empathy[32], attitude [33], expectations, cultural adaptation, and therapist differences)[34-36] have been proposed, including the clients' contributions[37]. Essential skills for all psychotherapists are relationship skills, attachment, and emotional intelligence abilities. For psychodynamic therapy, technical neutrality was found to correlate with success[38].

INTEGRATION OF KNOWLEDGE

Nowadays, embedding psychodynamic thinking with an evidence-based approach aims at integrating different kinds of research, looking at cognitive processes from different perspectives.

The constant questioning of "truths" leads to openness to innovations and engagement with associated research fields (*e.g.*, neuropsychology, neurosciences, communication-sciences). As outlined above, a mixed-method approach is necessary when generating evidence in a real-world scenario. The choice of the method depends on the research question, but independent of the method considered, quality depends on preventing bias (*e.g.*, recall bias, selection bias, observation bias, confirmation bias, and publishing bias). As mentioned above, the approach should be a problem-solving one. Collaboration, support (*e.g.*, methodological support, guidelines), peer review, and open science reforms call for openness in the scientific discourse[39].

Developing substantial research questions requires excellent knowledge of the investigated research topic and the problem identified. The uncertainty and complexity of knowledge and parties involved limit the academic debate, and already the possible questions impact answers. Thus, integrating new theories and strains of expertise and strategies in existing frameworks and dynamic systems (*e.g.*, *via* a public/patient involving design) requires an adequate understanding of the system, influencing factors, and a generalization across its states and the ones of the observing unit/system. This integration of findings might be challenging and time-consuming [40]. Scientific theorizing involves acknowledging uncertainty and expressing the limitation of results.

Applying this to the example of research in emotion and behavior will demonstrate the rise of a new research field by integrating different approaches and awareness of limitations in research. Emotion has been a mainstream topic in the last decades[41]. Psychoanalysts and neuropsychologists have equally been interested in understanding emotional processes. The interest in this research field is understandable because of the influence emotion has on cognitive abilities. This impact is especially true in directing an individual's attention, perception of reality, motivation, and memory[42]. Human emotions determine how an individual uses its resources, and they have importance not only when triggered by internal stimuli but also when interacting with external triggers (compare, *e.g.*, mentalization based therapy)[43].

Generation of meaning is bound to the interplay between individual and (social) environment under specific conditions and frames memory traces. Each selection between different action options (and thoughts) influences subsequent decisions. When relying on experience, actualization is facilitated if adaptation to the current environment is perceived as sufficient. Implicit bias refers to unconscious assumptions, categories, and attitudes influencing our perception and appraisal[42]. Cognitive bias enables fast cognitive processing and roots in evolutionary advantage arising from this stereotype judgment, with evident affective influences.

The world of science seeks to study phenomena through observation and experiment. The impact of the flexibility of analytical approaches was investigated recently for the field of neuroimaging: the analysis of a single neuroimaging dataset by many teams showed substantial variability despite significant consensus in activated regions [42]. The authors stress the importance of validating complex workflows and analyzing data[42] through different research teams, taking into account implicit bias. Also, for the field of explainable artificial intelligence, a paradigm shift has been

suggested to avoid confirmation bias and increase transparency and validity[44].

Emotion theories from various research fields were concerned with components of emotional processes. Emotions include preceding mental and bodily states, appraisal and consequences like consciousness, generation of symbolic meaning, and/or enactment *via* behavior. The importance of process in addition to outcome research has been emphasized. Looking at micro processes prior/during and after social interactions makes sense in emotion research as emotional reactions arise during interactions with others and are perceived and regulated moment by moment[45-47].

As the science of the unconscious, psychoanalysis investigates human minds and mentality, aiming to provide an environment for the transformation of enactment into reflection, preventing recurring patterns if identified as destructive or harmful[48]. This process of adaptation occurs in the individual as well as in society. However, how does this happen? An “analytic environment” provides an actualization of memories and related implicit and unconscious knowledge and affective linkages. The psychoanalytic method aims at broadening the field of experience and perception. Providing a revalidation and reinterpretation of existing viewpoints leads to freedom of thought and action and reshaping memories or appraisal. Integration of so far indigestible contents in a more favorable narrative leads to a changed perception of reality and perspectives. The focus is on the affective interplay and processing in the actualized situation, thus demanding time to analyze ongoing interactions[47,49]. Leading affects in the early dyadic interplays directly affect conceptions of the self. A child’s internal abilities to cope with reality depend on whether specific representational structures (self, others, relationships) have been created in the early interactions[50,51]. Interactional patterns are socially transmittable, and their modification is challenging.

Psychotherapy research is concerned with process and outcome investigation of how specific factors contribute to therapy success or alliance rupture and failure. Observational research often assumes that behavior is more or less proving of mental and affective states. However, modifiers and moderators must be considered when aiming at attributing results to specific therapeutic interventions. For mice, facial expressions have been linked to emotional states and their neuronal correlates[50,52]. While in the mouse model and under laboratory circumstances, this might be more straightforward, generalization to real-life scenarios requires caution when interpreting findings.

When it comes to investigating persons with disturbances or diseases of their mental health, their vulnerability[53] must be acknowledged in therapy as well as when conceptualizing research[54,55] (1949 Nuremberg Code, updated in the 2008 World Medical Association Declaration of Helsinki, and in the 1979 Belmont Report). On the other hand, excluding persons only because they belong to vulnerable groups has been discussed as equally unethical and contributing to research bias[56,57]. Each case must be considered, especially when dealing with persons with (temporarily, fluctuating, or permanently) impaired mental state. In psychoanalytic therapy, investigation of therapy dropouts revealed that multiple factors contribute to the decision to continue or to dismiss treatments. Goals, readiness to change, awareness and insight capacity, resistance, and transference are well-known factors[55]. However, when Lacan[57] attempts to conceptualize psychoanalytical ethics, he places the problem of desire at the center of his ethics[56]. “At every moment we need to know what our effective relationship is to the desire to do good, to the desire to cure.” Lacan[57] keeps reminding us that the sphere of human subjectivity, including unconscious fantasies, is a dimension the analyst cannot pretend to know. Lacan[57] emphasizes that not only the patients’ unconscious wishes are present, but also the analyst’s own desires. Acknowledging this is the starting point in preventing the psychoanalyst’s application of personal reality and desire as a normative ideology to the patient[58]. This includes “hidden agendas of economic power and status” and morality[56].

Self-related processing, the wish to be the agent of one’s actions in the world, and orientation towards relevant others (*i.e.* innate attachment motive) through repetitive interactional interplay leads to creating social bonds as to the human’s impact on the environment. Interactive resonance contributes to attachment formation with relevant others[46]. Medical knowledge integration is ambitious due to the heterogenous field involving biological, behavioral, and social sciences providing data (bottom-up)[59]. Top-down organismic systems medicine has been proposed as an integrative approach [40].

When merging psychoanalytical with neuroscientific conceptions, both assume that major adaptations and developments related to cognitive abilities merely take place in the first decades of life. This goes in hand with current attempts to detect and treat vulnerable subjects already early in their life to prevent mental disorders later on[37]. Following systems theory, a rather integrative approach, and complex systems can

only be understood in their context, influencing each other[60] through a web of connections depending on their complexity.

Subliminal affective reactions can be hints for targeting specific interventions[61-63]. The ability to infer mental and affective states evolves early in life, but different interpersonal and arousal contexts influence available strategies[64]. When dealing with a subject's memories, this is supposed to be emotionally challenging because only subjectively valuable content is stored. However, when experiences are overwhelming, accessibility of memory content might be reduced. Containment also depends on the attitudes and competencies of the containing person[33,48]. Memories are not unchangeable. However, defense against arbitrary manipulation is adaptive and intelligible due to obvious reasons. Psychodynamic therapies aim to explore and interpret internal conflicts to assist people when earlier experiences influence a destructive and distorting way on present options[63].

Providing an opportunity to model oneself by reconsidering our mind, various core factors apply. This remodeling would imply a reconceptualization of the self and others and the relationships between them and anchoring this process in the embodied self[64]. When interacting with the world, self-representations and world-representations are actualized. Hence, psychotherapy constitutes a setting where this process is supposed to happen in a sphere of expanded subjectivity (involving the therapist), considering rational aspects and experiencing[19,40,46].

CONCLUSION

In conclusion, integrating relevant findings into psychoanalytic theories requires a top-down approach (*i.e.* a meta-theory) constantly metabolizing up-to-date empirical evidence. Thus, differentiation of knowledge about mental conditions evolves dynamically in a sphere of unification of multiple features contributing to the whole, also very subjective contributions to the topic of facilitating change.

Almost any phenomenon can be studied qualitatively and quantitatively. However, applied techniques determine results, and choosing the adequate research method according to the scope and research question is critical for gaining an in-depth picture of the addressed topic.

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