Functional analysis (Psychology)

Generally, an analysis of a complex system with an eye to the functions of the various aspects of the system and the manner of integrated operation. Such an analysis usually soft-pedals the actual form or structure. The system analysed can be essentially anything; the term is used in this fashion very broadly.

Somewhat more specifically, the term is associated with the strong behaviourist point of view of B. F. Skinner. Here the full term is functional analysis of behaviour and the stress is on examining behaviour per se while eschewing appeals to internal cognitive or physiological components.

Functional analysis is a strategy for the assessment and treatment of mental health problems (or preferably "behavioral problems") with origins in radical behaviorism, and particularly behavior therapy. It is generally viewed as an assessment and treatment strategy within the larger realm of behavioral assessment and behavior therapy. More specifically, functional analysis is a set of procedures that attempts to identify important environmental variables that develop and maintain behavior. The clinical goal of functional analysis is to effectively identify targets of intervention that are alterable, in order that appropriate treatments may be rapidly implemented and evaluated.

Historically, functional analysis entered psychology through the influence of B. F. Skinner, who in turn was influenced by Ernst Mach's conceptualizations of functional relationships. Mach attempted to resolve David Hume's proffered puzzle about causation, that is, that causal relationships are never observed, but are just "constant conjunction." Mach suggested that instead of "cause" one focus on functional relationships, that is, relationships (often depicted in Cartesian coordinates as $y = f(x)$) such that the value of one variable is seen as systematically depending on the value of another variable. Skinner agreed with this suggestion, and his cumulative recorder can be viewed as an instrument that attempts to capture and depict functional relationships. Functional analysis becomes the systematic attempt to uncover these functional relationships.

Behaviorally oriented clinicians have questioned the usefulness of diagnosis and syndromal classification systems such as the Diagnostic and Statistical Manual of Mental Disorders of the American
Psychiatric Association (2000) on many grounds. Of particular relevance to functional analysis are the significant varieties in symptom presentation that comprise a single category. A key concern is whether topographical similarities in behavior are useful for postdicting causes or predicting treatment responses. As a result, newer approaches to assessment that consider the function of the behaviors over the topographical form of the behaviors, and that attend more closely to individual differences in behavior, have been explored. The product of this desire to understand behavior functionally and idiographically is functional analysis.

Functional analysis is a term that has been used with some overlap with several others in the behavioral literature, including behavioral analysis, behavioral assessment, functional behavioral analysis, and behavioral case formulation. Compounding the confusion is that just as many terms are used to refer to the same procedures, functional analysis is used to refer to a diversity of procedures in the literature. This phrase has been used to describe any part of the process that includes discovering the variables of which behavior is a function, designing an intervention for the environment or behaviors, implementing the intervention, reevaluating the case conceptualization based on response to treatment, and recycling the process until the problem subsides. Although some behavior analysts focus exclusively on the assessment portion of this intervention process, others consider the whole process to be a complete functional analysis.

Procedures
Functional analysis is derived from basic behavioral principles. It attends to the antecedents, stimuli, responses, consequences, and contingencies that produce and maintain effective or ineffective behaviors. The identification of pertinent, controllable variables in this sequence, and the effective treatment of those variables to produce different outcomes, are its challenges. The basic form of a functional analysis is (1) identify aspects of the client and his or her environment or history that may be relevant to the problem; (2) organize information about potentially relevant variables according to behavioral principles in order to identify possible causal relationships among variables; (3) collect additional detailed information about potential causal variables in order to complete the analysis; (4) identify or create a treatment hypothesized to produce a desired increase in the frequency or intensity of the causal variables based on the case conceptualization of how the variable functions for the individual; (5) implement the intervention for one variable at a time and observe any changes in the problem; (6) if there is no change in the target behavior, remove the original intervention, move to the next suspected causal variable, and implement and evaluate the treatment of that variable; (7) if the problem is not alleviated, return to the case conceptualization to identify alternative variables that may be pertinent or alternative causal relationships and continue with the steps of the functional analysis; and (8) continue to revise the conceptualizations and interventions until the problem is solved.

Strengths and Weaknesses
The strengths of functional analysis are the precisions with which cases may be conceptualized and the direct link to treatment implementation. Instead of relying on imprecise diagnostic categories as heuristics to guide conceptualizations of the problem, both case conceptualizations and treatment planning focus on the unique aspects of the particular problem. These unique aspects of the problem are the points of customized clinical interventions instead of a generic syndrome-level intervention.

The weakness of functional analysis stems from its lack of specificity. Initial variables to be put into the analytic methodology (e.g., parental attention as a maintaining factor for a child's tantrum) are based on

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clinical judgment or experience, and thus functional analysis remains partly an art. In addition, communication between mental health professionals and replication of assessment, treatment, and treatment evaluations are impeded by the imprecision of functional analysis language and procedures. When different terms are being used for functional analyses, relevant information may not be shared, because it is not identified as belonging to the functional analysis category. Similarly, when functional analysis is used to refer to overlapping or altogether different procedures, miscommunications may occur, because the discussants are working from different assumptions about the procedures that are involved. Moreover, as communication is increasingly removed from direct observations of client behaviors, there are greater opportunities for miscommunications to arise. In addition, functional analysis may be much more expensive (e.g., requiring direct observation in clients’ naturalistic environments) than other assessment strategies such as the clinical interview or paper and pencil tests.

A related problem is replication. Functional analysis currently refers to a range of assessment and intervention procedures. Without a standard of practice for the subfield, clinicians may perform different sets of procedures and call each of them a functional analysis. As a result, there is no guarantee that one clinician’s conclusions are going to match another clinician’s conclusions in the same case. This lack of replicability detracts confidence from the assessment procedures, thereby diluting their effectiveness. Furthermore, if a functional analysis cannot be replicated, doubt is cast on its ability to reliable studies of the phenomenon. This replicability problem ironically renders an assessment and intervention procedure that arose out of the behavioral empirical literature untestable.

**Future Directions**
The field of behavior analysis lies in acknowledging the strengths and weaknesses of functional analysis and beginning to propose improvements. Suggestions have been made that promote standardizing the definition of functional analysis and the procedures that comprise such an analysis in order to advance communication and replication. Additional proposals have been made to strengthen the communication aspect of the procedure. The development of a nomothetic classification system that is based on functional analysis has been offered. Proposed variations of this taxonomy include expert systems, logical functional analytic systems, and functional diagnostic systems, each based on functional analyses.

In addition to more advanced clinical applications, researchers have segued into an expanded use of functional analysis as a research strategy. Compiling and analyzing functional analytic data within and across clients may contribute to basic understanding of many behaviors and behavior-environment interactions.

**See also**
Behavioral Assessment; Contextualism.

**Suggested Readings**


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