PERGAMON

Behaviour Research and Therapy 37 (1999) 347–368

BEHAVIOUR RESEARCH AND THERAPY

Invited Essay

Behavioral assessment of personality disorders

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Received 18 June 1996; revision received 23 October 1997

Abstract

This article examines the definition of personality disorders (PDs) from a functional analytical framework and discusses the potential utility of such a framework to account for behavioral tendencies associated with PD pathology. Also reviewed are specific behavioral assessment methods that can be employed in the assessment of PDs, and how information derived from these assessments may be linked to specific intervention strategies. © 1999 Elsevier Science Ltd. All rights reserved.

To some, the very title of this article might seem oxymoronic as some behaviorists eschew the concepts of personality and personality disorder (PD) because of their trait and mental illness connotations and because of the inferential nature of such constructs. Indeed, the DSM-IV defines the concept of PD as: "...an *enduring* pattern of inner experience and behavior that deviates markedly from the expectations of the individual's culture, is *pervasive and inflexible*, has an onset in adolescence or early adulthood, is *stable over time*, and leads to distress or impairment" (American Psychiatric Association, 1994, p. 629, emphasis ours). This definition contains some apparent incompatibilities with the behavioral view (e.g., that behavior is situation specific, as elaborated below). Despite these apparent contradictions, this article seeks to describe how concepts within a behavioral model can provide a useful framework for the assessment of PDs and PD features. This is then followed by a discussion of behavioral techniques suitable for the assessment of PDs and associated features, and the application of assessment information to specific intervention strategies. We begin by providing an overview of the utility of PD diagnosis from a behavioral perspective, while highlighting some of the relevant controversies currently debated within this area.

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PII: S0005-7967(98)00142-9

1. Utility of personality disorder diagnoses from a behavioral perspective

Historically, behavioral assessors were satisfied with identifying target behaviors for each individual; that is, idiographic problematic responses that were selected for intervention. More contemporary behavioral assessors find diagnoses, including the DSM diagnoses, to be useful (Kazdin, 1983; Nelson & Barlow, 1981). Most importantly, a clinical science rests on the recognition of commonalities among groups of individuals. Diagnosis recognizes and labels these commonalities so that researchers can make contributions to the research literature and access the contributions of others. Diagnosis, especially when based on an internationally-recognized diagnostic schema, allows communication among professionals (e.g., in the making referrals, in record-keeping, and in accountability). Diagnosis also provides suggestions of responses that nomothetically covary. A wise clinician will assess for other responses within a diagnostic set when some responses from that set are evident. Some diagnostic manuals such as the DSM provide suggestions of nomothetic controlling variables. The DSM does so in the narrative sections in the chapters on various diagnostic groups. Finally, diagnosis can provide nomothetic suggestions for treatment; for example, dialectical behavior therapy for those with borderline PD described by Linehan (1993a) or Beck's suggestions for modifications of cognitive therapy for specific PDs (Beck, Freeman, & Associates, 1990). As suggestions provided by diagnosis are nomothetic, the behavioral assessor must determine if idiographic modifications are needed for the particular client.

Although it is beyond the scope of the present article to evaluate thoroughly the utility of DSM PD diagnostic concepts or, for that matter, the utility of diagnosis from a behavioral assessment perspective, we well recognize that controversies exist in these areas (Farmer, 1997). For example, in the area of PDs, there is debate as to how PDs should be best classified or modeled (e.g., Cantor & Genero, 1986; Livesley, 1986; Widiger & Frances, 1985), particularly in light of data which suggest that PD features tend to be continuously distributed (Frances, Clarkin, Gilmore, Hurt, & Brown, 1984; Kass, Skodol, Charles, Spitzer, & Williams, 1985; Zimmerman & Coryell, 1990a). These latter findings are problematic for the utility of psychiatric diagnosis which presumes an underlying dichotomous distribution (i.e., present versus absent). Additional research (reviewed in Widiger, 1992) further suggests that dimensional modeling of PDs is associated with higher reliability and validity indices than the present categorical modeling scheme. The difficulty of imposing a discontinuous categorical classification scheme on continuously distributed dimensional phenomena is not unique to PDs, however. Indeed, the same concerns apply to the so-called "syndromal disorders" codes on Axis I of DSM (e.g., mood and anxiety disorders) (Kendler, Neale, Kessler, Heath, & Eaves, 1992; Rutter, 1989).

One of the more reliable findings in the PD assessment literature is empirical support for the DSM's clustering of PDs into three symptomatological groupings: odd–eccentric (paranoid, schizoid, schizotypal), dramatic–emotional (histrionic, borderline, narcissistic, antisocial), and anxious–fearful (dependent, obsessive-compulsive, avoidant, and in previous editions of DSM, passive–aggressive). Multivariate studies provide support for this clustering scheme (Bagby, Joffe, Parker, & Schuller, 1993; Farmer & Nelson-Gray, 1995; Hyler & Lyons, 1988; Kass, et al., 1985; Morey, 1988; Zimmerman & Coryell, 1990b). This research, coupled with that of other multivariate studies which indicate that individual PD features generally do not factor

into the discrete categories to which they belong (Hyler, et al., 1990; Livesley & Jackson, 1986), may suggest that PD categories may ultimately have greater utility at the cluster level than at the currently emphasized level of individual PDs (see Goldberg, 1993, and Hampson, John, & Goldberg, 1986, for a discussion of the hierarchical structure of personality).

While noting the above concerns associated with PD conceptualization and specification, we proceed with the assumption that current DSM PD categories have utility in the absence of overwhelming data to the contrary. As such, the purpose of this article is to demonstrate how the use of two assessment frameworks, behavioral/functional analytical (i.e., SORC, as elaborated below) and the construct of PDs, informs each other. Whereas the literature on PDs provides a useful content for nomothetic conceptualizations, the functional analytic framework, in turn, provides useful idiographic assessment and treatment directions.

2. Applicability of the SORC model to personality disorders

The behavioral assessment framework that is utilized here is the SORC model of Goldfried and Sprafkin (1976). SORC is an acronym for *S*-timuli-*O*rganism variables-*R*esponses-*C*onsequences. In this model, an individual's responses are thought to be a joint function of immediate environmental variables (stimuli and consequences) and of organism variables (physiological characteristics and past learning history) that the individual brings to the situation. The components of this model can provide a framework for the assessment of PDs and associated features.

2.1. Responses

The responses that are necessary for the diagnosis of specific PDs are listed in the diagnostic criteria of DSM-IV. Consistent with Lang's notion of the triple response system (Lang, 1968), motoric, physiological, and cognitive responses are included. To use borderline PD as an example, a diagnostic criterion that includes motoric responses is "recurrent suicidal behavior, gestures, or threats, or self-mutilating behavior"; a diagnostic criterion that is a physiological (emotional) response is "affective instability due to a marked reactivity of mood"; and a diagnostic criterion that is a cognitive response is "identity disturbance: markedly and persistently unstable self-image or sense of self" (APA, 1994, p. 654). It is our view that the concept of diagnosis is useful because, among other reasons, it recognized the commonalities in covarying responses that occur across individuals (Nelson & Barlow, 1981).

Behaviors are considered to be abnormal by a variety of criteria, including statistical deviance (e.g., behaviors that are quantitatively more frequent or more intense than the norm), the criterion of adjustment (e.g., behaviors that interfere with satisfactory functioning), and a qualitative difference model (e.g., behaviors that are qualitatively different from the normal population) (Adams & Cassidy, 1993). Probably all of these criteria were in use when the diagnostic criteria for the PDs were devised. An additional criterion for abnormal behavior that is especially appropriate for PDs might be rigidity or inflexibility of a behavioral repertoire. As noted by Adams and Cassidy (1993, p. 11):

> An interesting implication of the situational-versus-trait argument has been suggested by Adams (1981) and Marrioto and Paul (1975). Individuals who do not vary their behavior as the situations change, and thus appear to be 'traitlike', may be more psychologically disturbed than a person with the more common pattern of varying his or her behavior as a function of stimulus situations.

Data by Jones, Reid, and Patterson (1975) show that behavior of normal boys is more responsive to situations than the behavior of deviant boys. This inflexibility of behaviors across situations is captured in the DSM-IV definition of PDs. This rigidity or inflexibility of behavior demonstrated by persons diagnosed with PDs is very much related to the next behavioral concept, that of situation-specificity.

2.2. Stimuli and consequences—the concept of situation-specificity

The notion that behavior varies dependent on the stimuli and consequences of the situation at hand is called the situation specificity of behavior. Data that behavior does vary, dependent on the situation, have been used to challenge trait notions that imply constancy of behavior across situations (Mischel, 1968; Peterson, 1968). Indeed, this concept of situation specificity of behavior seems antithetical to the very idea of PDs.

There is very little research on whether the behavior of persons diagnosed with PDs is truly more inflexible, that is, less situation-specific, than the behavior of non-diagnosed individuals. In one study that compared the behavior of histrionic and compulsive analog subjects with the behavior of normal subjects, all three groups were comparably responsive to situational changes (high vs. low demand tasks, public vs. private audience) (Amodei & Nelson-Gray, 1991). Research such as this, however, is non-conclusive as analysis of variance models used to test the effects of person versus situation and their interaction are influenced by the relative heterogeneity or homogeneity of the data for each factor (McFall & McDonel, 1986). That is,

> ...the proportion of variance due to persons, situations, or their interaction is not a constant, but is always a function of the particular questions being asked in an experiment, the details of the experimental arrangements, and the characteristics of the populations, situations, and measures employed. Thus, the question of which type of variable is most influential is intrinsically unresolvable (McFall & McDonel, 1986, p. 223).

Even without the benefit of clear data, it seems apparent that the behavior of personality-disordered individuals is not completely inflexible, nor is it as flexible as the behavior of non-diagnosed individuals. People with PDs behave normally and flexibly in some situations, but not in others. It would seem that the identification of these latter situations would be particularly important for behavioral assessment. Perhaps people with PDs behave inflexibly only in situations that are 'important' for their disorder, for example, interpersonal situations for persons diagnosed with Cluster B erratic–dramatic PDs, or achievement situations for persons diagnosed with obsessive–compulsive PD. Some data do show that those with

dependent PD respond differently to significant others than to strangers (Catterall, 1994; Schenker, 1994). Perhaps 'important' situations can be defined by their consequences to the individual; when the consequences are 'important', then the personality-disordered individual responds inflexibly.

Another possibility is that people with PDs respond flexibly (or normally) in structured situations where a narrow range of behavior is acceptable (such as in a library or at a funeral), but respond more inflexibly when the situation is less structured. In less structured or 'weak' situations, behavior may be more heterogeneous across individuals because the response–reinforcement relationships are less defined. Some individuals, however, may respond inflexibly to certain types of 'weak' situations (e.g., interpersonal disagreements, or decision making situations) that are functionally similar for them.

Such thinking is consistent with the views of Staats (1986) who holds that we need to move beyond data collection in the person–situation debate to specification of principles that explain flexible or inflexible behavior:

> Rather than studies that show grossly that behavior can differ in different situations, what is needed in the specification of what environmental circumstance produce what behaviors, according to specific principles. Moreover, how the situation interacts with personality must be specified (Staats, 1986, p. 246).

Some interpret situation specificity or inflexibility according to traditional learning principles (Mischel, 1968; Staats, 1986). Behavior is similar across situations if the situations are functionally similar through stimulus generalization. Conversely, behavior is dissimilar across situations if the situations are functionally dissimilar through stimulus discrimination. Others interpret situation specificity or inflexibility according to cognitive perspectives (Mischel, 1973). From this perspective, behavior is similar across situations that are perceived to be similar, for example, because of the individual's encoding strategies or expectancies. A mechanism to account for inflexibility of behavior in interpersonal situations has been proposed by attachment theory and object relations theory whereby individuals' reactions to contemporary relationships are determined by their early childhood attachments and the development of object relations. Pilkonis (personal communication, March 17, 1996) is using this theory to map attachment constructs onto other measures of PDs to determine what advantages or disadvantages there are in understanding PDs in attachment terms.

Regardless of the mechanisms that account for stimulus specificity or inflexibility, the behavioral assessor must determine the situations in which personality-disordered individuals manifest dysfunctional behavior, just as the behavioral assessor would do so for any client.

2.3. Organism variables—past learning history

The behavioral view that a cross-section of behavior is situation-specific for each individual is compatible with the view that behavior is longitudinally consistent. In other words, as certain situations reoccur across time, the individual will manifest similar behaviors. Staats (e.g., 1986) has thus proposed a behavioral view of normal personality development in which

an individual develops cumulative and complex behavioral repertoires in various domains (i.e., language-cognitive repertoire, sensory-motor repertoire, and emotional-motivational repertoire) that is longitudinally consistent. This view is equally applicable to the development of PDs. A particular repertoire may become not only longitudinally consistent, but also inflexible across a range of situations if the modeling and reinforcement of particular behavior patterns occur many times across that range of situations. The repertoire of a personality-disordered individual (as well as non-disordered individuals) is 'enduring' and 'stable over time', consistent with the DSM-IV definition of PDs.

The literature on PDs is rich in hypotheses about particular histories that lead to the development of particular PDs. For example, for borderline PD, "Physical and sexual abuse, neglect, hostile conflict and early parental loss or separation are more common in the childhood histories of those with Borderline Personality Disorder" (DSM-IV, p. 652). The key feature of these environments, according to Linehan (1993a), is that the environment is invalidating of the child's emotions:

> An invalidating environment is one in which communication of private experience is met by erratic, inappropriate, and extreme responses. In other words, the expression of private experience is not validated; instead, it is often punished, and/or trivialized (Linehan, 1993a, p. 49).

According to Linehan, types of invalidating families are chaotic families, 'perfect' families in which negative emotion is not tolerated, and typical Western families which emphasize cognitive self-control over negative emotions. Speculation about the learning history of dependent PD is provided by Benjamin (1993), as follows. The developmental cycle begins very well with the child being provided with excellent nurturance, which is reflected in the adult dependent having an unquestioned trust in a significant other. However, as it became appropriate for the child to develop autonomy, the parent did not let this happen and became over-controlling. Because the child does not adequately develop competence, he or she is mocked by his peers, internalizes this sense of inadequacy, and develops poor self-confidence. Speculation about the learning history that leads to the development of narcissistic PD is provided by Kohut (1977), as follows. Narcissistic PD may develop if the parent provides too much or insufficient mirroring; mirroring is when the parent provides the child with a sense of recognition and acceptance, providing developmentally-appropriate support and reassurance. When a parent occasionally fails to provide appropriate mirroring, the child then looks to himself for such support and assurance in normal development. Similarly, narcissistic PD might also result from errors in idealization, which is the child's perception of the parent as someone who can provide reassurance, comfort, and physical safety. If the child is never able to witness the parent's limitations or if the child is always prevented from idealizing the parent, then the child does not learn to provide these needs for him or herself which is part of normal development. Of course, in all of these three examples, empirical research is needed to support these hypothesized developmental sequences leading to different PDs.

2.4. Organism variables—physiological differences

According to the SORC model, organism variables include both past learning history and physiological characteristics which the individual brings to a specific environmental situation. Physiological characteristics include genetic predispositions, physiological correlates of the disorder, temperament, and appearance, all of which could be important in the development of specific PDs.

DSM-IV provides statements about which PDs tend to run in families. Of course, these statements do not sort out the effects of shared learning environments and heredity because independent genetic evidence is necessary to make conclusions that there is a heritable component to a PD. Nonetheless, it is interesting to speculate that there may be genetic contributions to some PDs; for example, schizotypal PD runs in the same families as schizophrenia (e.g., Kendler, McGuire, Gruenberg, & Walsh, 1995), which is known to have a heritable component. Similarly, data from twin, family, and adoption studies generally support contributions of genetic and congenital factors in transmission of antisocial behaviors (Sutker, Bugg, & West, 1993).

There has been much investigation into physiological correlates of certain PDs (primarily antisocial PD) where these physiological correlates may be a mechanism of gene action that influences behavior. Various studies that have investigated the under-arousal hypothesis of psychopathy, for example, have concluded that psychopaths compared with non-diagnosed persons "are slow to condition fear to warning signals, less influenced by threats of punishment, less capable of anticipating negative consequences, and inclined to overrespond to unusual or exciting stimuli" (Sutker et al., 1993, pp. 357–358).

Temperament differences have been related to PDs in several ways. Eysenck (e.g., 1969) has proposed that individuals differ constitutionally in neuroticism which is related to autonomic nervous system activity and in extraversion which is related to central nervous system activity. Farmer and Nelson-Gray (1995) found that persons with Cluster B ('erratic–dramatic') PDs fit within Eysenck's neurotic extravert quadrant, whereas persons with Cluster C ('anxious–fearful') PDs fit within Eysenck's neurotic introvert quadrant. Similarly, Gray (e.g., 1981) has proposed a Behavioral Activation System (BAS) and a Behavioral Inhibition System (BIS). Farmer and Nelson-Gray (1995) showed that persons with Cluster B PDs were high in impulsivity (related to BAS), whereas persons with Cluster C PDs were high in anxiety (related to BIS). Cloninger (e.g., Cloninger & Svrakic, 1992) has described three temperament dimensions associated with normal and abnormal personality variants: novelty seeking, harm avoidance, and reward dependence, with each of these personality dimensions hypothetically linked to different monoamine systems. Recent research by Svrakic, Whitehead, Przybeck, and Cloninger (1993) has associated the odd–eccentric, erratic–dramatic, and anxious–fearful PDs with low reward dependence, high novelty seeking, and high harm avoidance, respectively. Siever (e.g., Siever & Davis, 1991) has proposed a psychobiological model which posits four phenomenologically based continua (i.e., impulsivity/aggression, affective instability, anxiety/inhibition, and cognitive/perceptual) that link Axis I (syndromal) and Axis II (personality) disorders. In several studies, a variety of biological correlates (e.g., neurotransmitter functions, eye tracking) have displayed similar associations across syndromal and PDs (e.g., Coccaro et al., 1989; Siever et al., 1990a,b).

Linehan (1993a) has proposed an interaction between a child's temperament and environment to produce borderline PD. Specifically, the child who develops into an adult diagnosed with borderline PD may have been temperamentally a 'difficult child', described by Thomas and Chess to be a "group with irregularity in biological functions, negative withdrawal responses to new stimuli, nonadaptibility or slow adaptability to change, and intense mood expressions that are frequently negative" (1985, p. 219). According to Linehan (1993a), there may be a poor fit between a difficult child and an invalidating environment (described earlier), leading to the development of a person with borderline PD.

A final organism variable that could be postulated as influencing the development of PDs is the individual's physical appearance. It is certainly possible that histrionic men and women are, in fact, more attractive than average. It makes sense that if one "consistently uses physical appearance to draw attention to self" (DSM-IV, p. 658), then that attention must typically be positive, perhaps because of an attractive physical appearance. Similarly, it is possible that individuals with other PDs, such as schizoid, may be less attractive than usual, resulting in relative social neglect from adults and peers during childhood and in little positive affect related to relationships.

While empirical studies on physiological differences between persons diagnosed with PDs and non-diagnosed persons are somewhat infrequent, it is nonetheless useful for the behavioral assessor to consider organismic variables in doing a full assessment with a personality-disordered individual.

2.5. Short and long-term consequences

The final component of the SORC model is the consequences of behavior, namely, the short-term consequences that maintain personality-disordered responding and the long-term consequences that make them problematic. There are various examples of short-term consequences that most likely maintain the behavior of personality-disordered individuals, at least through intermittent reinforcement. Some behavior may be maintained by positive reinforcement, such as attention from significant others for those with dependent PD, and attention from others more generally for those with histrionic PD. Other behavior may be maintained by negative reinforcement, such as relief from anxiety generated by social contacts for those with avoidant PD or relief from anxiety generated by work and responsibility by those with obsessive-compulsive PD. In fact, negative reinforcement may maintain the self-cutting behavior sometime seen in individuals diagnosed with borderline PD. These individuals often report a sense of relief from cutting themselves (Leibenluft, Gardner, & Cowdry, 1987).

Even though these short-term consequences maintain behavior in personality-disordered individuals, the long-term consequences of those behaviors are, by definition, problematic for the individual. It is part of the diagnostic criteria for PDs that the behavior pattern causes distress or impairment in social, occupation, or other important areas of functioning (DSM-IV, p. 633). To perform a functional analysis, which is elaborated later, the behavioral assessor must determine both the short- and long-term consequences of problematic behavior.

3. Additional assessment information needed for behavioral assessment

In contrast to psychiatric diagnosis, behavioral assessment can suggest hypotheses about environmental factors which precipitate or maintain behaviors described within PD labels as well as possible underlying psychological mechanisms, such as maladaptive beliefs about the self. Whereas diagnostic labels themselves do not suggest idiographic therapeutic interventions (but may suggest nomothetic treatments), behavioral assessments often suggest controlling variables which, if identified and modified, may facilitate therapeutic change for the individual. Described within this section are additional kinds of assessment information that are necessary for a behavioral assessment with examples of how such information may be applied to the idiographic treatment formulation of the individual.

3.1. Selection of target behaviors

As an alternative to psychiatric diagnosis, behavioral assessors focus on target behaviors. Follette, Houts, and Hayes (1992) have noted that by studying clinically relevant behavior rather than classes of people, behavioral assessors and therapists are in a position to illuminate the mechanisms that facilitate and maintain those behaviors, and as such, can contribute to the understanding of how to change problem behaviors, regardless of who is displaying those behaviors or what diagnosis they may have.

Selection of target behaviors among persons with PDs can represent a considerable challenge. Often, there are many possibilities to choose from. Examples of general behavioral classes and associated environmental contexts (reviewed in Hawkins, 1986) relevant to the assessment and selection of behavioral targets among those with PDs include: behavioral excesses (e.g., constantly seeking praise or reassurance), behavioral deficits (e.g., engagement in few social activities), difficulties in stimulus control as evident by displays of inappropriate behavior in specific contexts (e.g., sexual provocativeness in inappropriate settings) or failures to display appropriate behavior in relevant contexts (e.g., passive resistance to routine occupational or social tasks), displays of behavior inappropriate for any context (e.g., wrist cutting), environmental non-reinforcement of appropriate behavior (e.g., non-reinforcement for initiating projects or doing activities on one's own, resulting in a relative absence of independently initiated behaviors) or reinforcement of inappropriate behavior (e.g., use of physical appearance to draw attention to self), excessively high or low performance standards (e.g., perfectionism that interferes with task completion), problems in self-regulation or control (e.g., impulsive or poorly controlled behavior such as substance abuse, promiscuity, or binge eating), and poor discrimination or inappropriate labeling of internal cues or private events (e.g., emotional detachment). Persons with PDs display many of these target behaviors. Complicating matters further, persons with PDs often present with other disorders (van Velzen & Emmelkamp, 1996), such as depressive disorders (Farmer & Nelson-Gray, 1990), anxiety disorders (Mavissakalian & Hamann, 1986), psychotic disorders (Fenton & McGlashan, 1989), substance abuse disorders (Malow, West, Williams, & Sutker, 1989), and eating disorders (Levin & Hyler, 1986). When observed among patients with PDs, behaviors associated with other co-occurring disorders should also be assessed and considered for treatment targeting.

Nelson and Hayes (1986) provide some guidelines for target behavior selection, including prioritizing among multiple target behaviors.

One assessment framework proposed by Hawkins (1979, 1986), the behavioral assessment funnel, can be useful in identifying specific target behaviors and associated intervention strategies. During the first phase, several potential problematic areas may be screened, with the range and scope of information gathered being broad and inclusive. Intervention decisions during this phase are likewise general, and may involve considerations as to whether treatment is indicated or the offering of appropriate referrals. During the second phase, the focus of assessment begins to narrow, culminating in the definition and quantification of the client's overall problem areas and, if relevant, the use of diagnosis or some other form of classificatory labeling to describe general covarying response patterns. Intervention options at a general level may also be considered, such as the potential utility of psychotropic medications or the use of a general intervention strategy (e.g., exposure therapy, cognitive restructuring, social skills training). During the third phase, the focus of assessment further narrows, with the goal of this phase being the identification of specific target behaviors and the design of intervention strategies linked to assessment information. In the fourth phase, the impact of intervention strategies on the target behaviors is continuously assessed in terms of the changes in frequency, severity, or pervasiveness. The fifth and final phase involves follow-up assessments of the target behaviors to assess the maintenance of treatment gains.

Research by Farmer and Nelson-Gray (1995) on the underlying dimensions of PDs has relevance for Hawkin's second phase of assessment. Behavioral excesses in the form of anxiety and social avoidance were found to characterize the PDs from the anxious–fearful cluster. In contrast, problems of self-regulation and impulse control were found to characterize the PDs from the erratic–dramatic cluster. General treatment implications from these assessment data suggest that effective methods for anxiety reduction, such as exposure therapy, may have some utility in the treatment of anxious–fearful PDs, whereas training in impulse control and emotion regulation skills may have utility for the erratic–dramatic disorders.

In another example from the PD literature on target behavior selection, Linehan (1993a) describes hierarchies of target behavior classes as well as specific target behaviors within each class for the treatment of borderline PD with dialectical behavior therapy (DBT). First-stage targeted behavior classes from most to least urgent are: (a) suicidal behaviors, (b) therapy-interfering behaviors, (c) quality-of-life interfering behaviors, and (d) behavioral skills to increase. Within each class, additional hierarchical targeting is recommended. In the case of suicidal behaviors, for example, the within class hierarchy consists of: (a) suicide crisis behaviors, (b) parasuicidal acts, (c) intrusive suicidal urges, images, and communications, and (d) suicidal ideation. Once progress has been made with first-stage treatment targets, therapy begins to focus on second-stage treatment targets, which involve the decreasing of post-traumatic stress. Finally, third-stage treatment goals include the increase of self-respect followed by the realization of individual goals.

3.2. Performance of a functional analysis

The functional analysis has a long and distinguished history within the area of behavioral assessment and therapy (e.g., Kanfer & Phillips, 1970). In contrast to the syndromal

classification of DSM, which might be described as 'structural', the focus of a functional analyses is to identify "important, controllable, causal functional relationships applicable to a specified set of target behaviors for an individual client" (Haynes & O'Brien, 1990, p. 654). As noted earlier, basic elements of a functional analysis include the identification of clinically relevant target behaviors or responses, the stimuli or antecedents that precede the target behaviors, the consequences (e.g., reinforcers and/or punishers) that follow target behaviors which function to influence the frequency of those behaviors, and a delineation of relevant organismic or individual difference variables such as physiological states or past learning which may be useful for developing an understanding of the client's present behavioral pattern and repertoire (Goldfried & Sprafkin, 1976; Nelson & Hayes, 1986). Once such an analysis has been performed, an intervention is devised which is conceptually linked to assessment findings. Treatment is then implemented, and change in the target behaviors continuously assessed. If the intervention does not produce improvements in behavior, it is usually assumed that either the original analysis is flawed or the intervention strategy is inappropriate given the events that establish and maintain the problem behavior (Hayes & Follette, 1992).

Linehan (1993a) presents one example of the use of functional analysis in the treatment of borderline PD, specifically as it relates to the display of parasuicidal acts (e.g., wrist cutting) which are common among members of this group. In the event that the client has engaged in a parasuicidal act since the previous session, a detailed functional analysis is performed. The goal of such an analysis is to identify the context in which the problematic behavior occurs. Such an analysis, for example, might reveal that a client cut her wrist (target behavior) following an argument with her boyfriend (antecedent event). Following this argument, the client may report having felt extremely guilty and empty, and experience thoughts such as "I'm unlovable" and "Everybody hates me" (clinically relevant behaviors). Possible consequences following wrist cutting, which influence its future frequency, might include relief from guilt and feelings of emptiness (negative reinforcement), the refocusing of attention away from unpleasant cognitions related to the self (negative reinforcement), statements of support and apology from boyfriend (positive reinforcement), a new scar (delayed punishment), and a sizable hospital bill following an emergency room visit (delayed punishment). The functional analysis of the parasuicidal act is then followed by a 'solution analysis'. The goal of the solution analysis is to challenge the client to identify alternative behaviors which may produce similar desirable consequences as the target behavior (e.g., relief from aversive emotions and cognitions, evocation of support from others). Once identified, the client is encouraged to substitute these alternates for the target behavior in future settings that typically elicit the target behavior and associated clinically relevant behaviors. The therapeutic utility of the solution analysis is premised on the notion that should behavioral alternatives be identified that yield the similar positive consequences (reinforcers) and fewer of the undesirable consequences (punishers), those alternative behaviors should increase in strength (i.e., increase in frequency and probability) and the target behavior will decline in strength. Linehan's treatment package, which includes the functional and solution analyses of parasuicidal acts, has been found to result in fewer incidents of parasuicidal behavior and fewer inpatient days than standard therapies (Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; Linehan, Heard, & Armstrong, 1993).

3.3. Problem based treatment selection

3.3.1. Case formulation approach

Turkat (1990) and Turkat and Maisto (1985) have outlined an approach to behavioral assessment for PDs which emphasizes the development of a case formulation, a controlled evaluation of that formulation, and the linkage of case formulation to treatment selection. There are three main components to this approach: the initial interview, clinical experimentation, and the application of an appropriate intervention strategy based on the formulation of the client's difficulties.

The primary goals which guide the initial interview are to: (a) identify and delineate the client's problem areas, (b) generate a theoretical formulation which addresses the inter-relations among these problem areas through the consideration of similarities in etiological, predisposing, precipitating, and maintaining factors, and (c) arrive at a corresponding diagnosis. The overall goal of the clinical experimentation phase is to verify the therapist's working theory of the client's problem areas through the use of systematic and controlled observation. To accomplish this goal, within-session experiments may be employed as a means of testing predictions about a client's behavior. For example, Turkat and Maisto (1985) present the case of a client with histrionic PD whom the therapist predicted, following his formulation, would show empathy deficits. To test this hypothesis, the therapist asked the client to engage in two tasks that involved the judgement of moods and thoughts of others based on the presentation of overt verbal and behavioral cues. The final phase of this approach involves the retainment of the most plausible explanatory theory which accounts for the client's dysfunctional behavior and the linkage of this formulation to an appropriate intervention strategy. Methods used to assess treatment effectiveness are varied in accordance with the case formulation.

Persons (1989) has modified Turkat's case formulation approach so as to emphasize the role of cognitions as causal determinants of psychopathology. As such, Persons' (1989) formulation distinguishes between two levels of analysis: overt difficulties and underlying psychological mechanisms. Overt difficulties are described as general problem areas for the client (e.g., suicidal thoughts, problematic interpersonal relations) which can be further described and differentiated within three component areas (cognitions, behaviors, and emotions). For example, the concept 'avoidant PD' can be more specifically defined in terms of cognitions (e.g., "People are evaluating me", "I wear my faults on my shirtsleeve"), behaviors (e.g., social isolation, behavioral inhibition and avoidance), and emotions (e.g., fear, anxiety, resentment). Underlying psychological mechanisms primarily refer to central maladaptive beliefs about the self (or schemas) that function to produce and maintain the client's overt difficulties (e.g., "I'm inferior to others"). Although underlying psychological mechanisms are viewed as the primary causal determinants of behavior, overt difficulties, in turn, can support and maintain these underlying mechanisms.

Assessment begins with the generation of a problem list, which may be accomplished through a clinical interview, the use of standardized paper and pencil measures, or through behavioral tasks (e.g., the Behavioral Avoidance Test). From this assessment information and the resultant problem list, the therapist develops a case formulation or theory about a client's problems or difficulties. Once the formulation has been established, it is then evaluated in

terms of its explanatory power based on its comprehensiveness and ability to account for items on the client's problem list, its ability to predict behavior, the client's acceptance of the formulation, and treatment outcome, with effectiveness of treatment serving as a barometer of the accuracy of the formulation.

As Persons (1989) observes, since underlying mechanisms cannot be directly observed or assessed, they are best viewed as working hypotheses to be tested in the course of therapy. One technique utilized to test hypotheses about underlying mechanisms is Socratic dialogue, where the client is asked to consider possible underlying thoughts when presented with a hypothetical situation. For example, Persons (1989, pp. 56–57) present the following dialogue between a therapist (T) and patient (P):

> T: "If you were going to take one step in the direction of being an interior designer, what would it be?"P: "I'd take a course at night."T: "Imagine you actually get to class and you begin working with the class on a project, say a living room of a house in the country. What thoughts do you get?"P: "I'll have no talent. I won't be able to do it."

Such a response by the patient might support the hypothesis that an underlying fear of failure may cause and maintain the client's overt difficulties as revealed in his poor work history.

Like Turkat, Persons (1989) emphasizes the role that the therapist's formulation of the client's overt difficulties and underlying psychological mechanisms plays in the selection of intervention strategies. Also similar to Turkat, Persons advocates the sharing of the formulation with the client and to solicit the client's input as to the formulation's accuracy. In the context of presenting the formulation to the client, Persons stresses the importance of describing the presumed underlying mechanisms, and how such mechanisms relate to dysfunctional behaviors, cognitions, and emotions. From this presentation, a treatment model is proposed, which often involves skills training for reducing overt difficulties and for modifying underlying pathological beliefs.

3.3.2. Identification of disorder-specific cognitions

Cognitive approaches to therapy with PDs (e.g., Beck et al., 1990; Layden, Newman, Freeman, & Morse, 1993; Young, 1994) are predicted on the assumption that the individual PDs are differentiated by unique cognitive processing styles, maladaptive beliefs, and cognitive structures or schemas. As such, therapies arising from the cognitive perspective emphasize the need to assess and identify disorder-specific attitudes and beliefs, and to then modify these maladaptive cognitions into more adaptive forms.

Beck et al. (1990), for example, delineate typical beliefs associated with individual PDs. In the case of dependent PD, typical beliefs include "I am needy and weak" and "The worst possible thing would be to be abandoned", with the primary belief or attitude being "I am helpless". Similar examples for histrionic PD are "In order to be happy I need other people to pay attention to me" and "The way to get what I want is to dazzle or amuse people", with the primary belief or attitude being "I need to impress". As yet unpublished research by Nelson-

Gray, Huprich, and Ketchum (1997) found general support for Beck et al.'s (1990) hypothesis that specific PDs are associated with distinctive dysfunctional beliefs.

Similarly, Young (1994) proposes the existence of 18 early maladaptive schemas which are the target of modification of his schema-focused approach to therapy for PDs. These 18 schemas are grouped into five content areas, and include: (a) disconnection and rejection (e.g., abandonment/instability, mistrust/abuse), (b) impaired autonomy and performance (e.g., dependence/incompetence, vulnerability to danger), (c) impaired limits (e.g., entitlement/domination, insufficient self-control/self-discipline), (d) other-directedness (e.g., subjugation, self-sacrifice), and (e) overvigilance and inhibition (e.g., vulnerability to error/negativity, overcontrol). Young (1994) has developed a schema questionnaire to assess the degree to which these schemas may be present or active. Within this approach, once schemas are identified, they are systematically confronted and challenged. Young (1994) is less specific than Beck et al. (1990) as to the association between specific schemas and individual PDs, although it would appear that the schemas delineated by Young describe many of the core issues and features associated with the PDs.

3.3.3. Identification of disorder-specific interpersonal patterns

Benjamin (1993) offers an interpersonal approach to the diagnosis and treatment of PDs. Benjamin's approach to the assessment of PDs, the Structural Analysis of Social Behavior (SASB), represents a model of social interaction patterns based on three orthogonal dimensions: interpersonal focus, love-hate, and enmeshment-differentiation. This approach seeks to link particular interpersonal contexts to each of the symptoms that define the various PDs.

In SASB assessment, the therapist first identifies a relevant interpersonal event from the client's reports. As the client relates his or her experiences in this interpersonal context, as well as those of important others, the clinician attempts to take on the perspective of each person in the interchange. As the clinician does so, he or she seeks to determine whether each person in the interchange is making reference to self or other. Once a self–other focus has been determined for each participant, the clinician then considers the degree of affiliation and interdependence which characterizes the interaction. Finally, judgments about interpersonal focus, affiliation, and degree of interdependence are combined and assigned corresponding labels within the SASB model.

As an illustration of an interpersonal formulation arising from this model, the following is a nomothetic interpersonal summary for narcissistic PD (from Benjamin 1993, p. 147):

> There is extreme vulnerability to criticism or being ignored, together with a strong wish for love, support, and admiring deference from others. The baseline position involves noncontingent love of self and presumptive control of others. If the support is withdrawn, or if there is any evidence of lack of perfection, the self-concept degrades to severe self-criticism. Totally lacking in empathy, these persons treat others with contempt, and hold the self above and beyond the fray.

Therapy within this model follows assessment formulations, where problematic aspects of interpersonal relations become the focus of the therapeutic work. Intervention techniques

emphasize the development of a positive collaborative relationship between the client and therapist, identification of current and past interpersonal patterns and their associative links, the modification or blocking of dysfunctional interpersonal patterns, the reduction of fears and the development of personal assets and strengths, and the development of adaptive interpersonal patterns.

3.3.4. Identification of disorder-related emotions

Recent years have witnessed a growing interest in psychotherapy approaches which primarily target emotions in order to bring about behavior change (e.g., Greenberg & Safran, 1987; Safran & Greenberg, 1991). There is presently however, no well-articulated or researched typology of PDs based on emotional experience, emotional expression, or emotion processing styles, although such a typology may be possible as many of the PDs are characterized by extremes in emotionality or deficit emotion regulation skills (Costa & Widiger, 1994; Farmer & Nelson-Gray, 1995). A delineation of prototypical emotional experiences, emotional processing styles, and emotion regulation strategies which characterize the various PDs may be valuable for the future development of emotion-based treatment approaches for the PDs.

4. Behavioral assessment methods applicable to the personality disorders

4.1. In-clinic observations

Kohlenberg and Tsai (1987) have described a therapeutic approach called Functional Analytic Psychotherapy (or FAP) which emphasizes the utility of continuous in-clinic observations of client behavior. Basic elements of this approach include the continuous functional analysis of the ongoing interpersonal process present in the psychotherapy environment and immediate therapist reactions to client behavior which function to shape and reinforce improvements in the client's behavioral repertoire.

Initial behavioral assessments in FAP involve the identification and specification of clinically relevant behaviors which may be targeted for reduction or promotion. Emphasis is placed on identifying observable behaviors that are related to the client's problem areas, that also occur in his or her natural environment, and that can potentially be evoked in the context of the therapeutic environment. Kohlenberg and Tsai (1987) suggest that in order for FAP to be successful, there must be a functional equivalence between the client's natural environment and the therapeutic situation as most of the therapeutic change in FAP occurs within the therapeutic setting, with this change expected to then generalize to natural environments that are functionally similar. Clinically relevant behaviors include: (a) displays of behaviors during the session that represent occurrences of the client's problematic behavior, with the therapeutic goal to decrease such behavior (e.g., excessive demands for reassurance, self-punitive statements); (b) the absence or non-display of behaviors that are related to the clinical problem, with the therapeutic goal to increase such behavior (e.g., awareness and verbalization of emotional experiences in an 'emotion phobic' individual, assertive behaviors among a socially avoidant person); and (c) the client's verbal behavior as it pertains to his or her own

clinically relevant behavior and associated controlling variables (e.g., identification of situations that evoke problematic behavior, consequences—both positive and negative—which follow problematic behavior, and the identification of functional equivalence as evident in client statements such as "When you asked me to comment on my feelings I responded to you in the same way I did when my father asked me how my day went.").

As Kohlenberg and Tsai (1987, p. 400) note, continuous in-session assessments focus on the question "Is it [the target behavior] happening now?" Treatment is thought to be more effective if the client's problem behaviors or improvements occur within the session, where they can be immediately responded to by the therapist. Consequently, FAP therapists' intervention strategies include evoking and observing clinically relevant behaviors, and the immediate and natural reinforcement of client improvements.

4.2. Semi-structured interviews and self-report measures

Widiger and Sanderson (1995) review assessment devices including questionnaires used to assess the presence or absence of PDs and PD-related pathology. One group of assessment devices includes semi-structured clinical interviews, which are often designed to assess DSM-defined PDs. Semi-structured interviews have the desirable features of reducing information and criterion variance by standardizing questions and objectifying scoring rules, thus leading to more reliable assessments. Examples of semi-structured interviews which assess PD features and permit diagnostic judgments are the Structured Interview for DSM-IV Personality Disorders (SCID-II; First, Gibbon, Spitzer, Williams, & Benjamin, 1996) and the Personality Disorder Examination (PDE; Loranger, 1988). Examples of semi-structured interviews designed to assess *specific* PDs include the Revised Diagnostic Interview for Borderlines (DIB-R; Zanarini, Gunderson, Frankenburg, & Chauncey, 1989) and the Diagnostic Interview for Narcissim (DIN; Gunderson, Ronningstam, & Bodkin, 1990). There are also a number of self report inventories designed to assess the presence of PDs, for example, the Millon Clinical Multiaxial Inventory-III (Millon, 1994).

From the perspective of behavioral assessment, responses to semi-structured interviews and questionnaires represent a sample of the person's behavior in the assessment situation (Barrios & Hartmann, 1986). As such, they may be useful in the identification of potential target behaviors. However, semi-structured interviews and questionnaires are often not useful in identifying contextual variables that control behavior, as questions are generally phrased without consideration of the situational contexts in which the behavior characteristically occurs (e.g., "Have you ever…" or "How many times…").

4.3. Role-playing

Inspection of criterion sets in standard nomenclatures suggest that PDs are defined, in large part, by interpersonal difficulties (e.g., unwarranted suspicion of others, social avoidance and distress, failure to conform to social norms, exploitation of others, excessive dependency, excessive attention seeking). As such, interpersonal skills constitute one potential area for assessment and intervention in the treatment of PDs.

Role-playing is one assessment technique that permits direct observation of interpersonal skills in clinical settings. Although role-plays are frequently employed in the assessment of social skills (Dow, 1994), there may be only a modest relationship between role-played and naturally occurring behavior (e.g., Bellack, Hersen, & Turner, 1979). Consequently, when using role-plays to assess interpersonal skills, consideration must be given to the variety of sources that contribute to inadequate setting generality. Dow (1994) has proposed a hierarchical task analysis which considers three general level at which deficit interpersonal skills may be demonstrated: (a) the inability to emit appropriate interpersonal bheavior in a protected or clinical setting (which suggests a skills deficit); (b) the ability to emit appropriate interpersonal behavior in clinical settings but not in naturalistic settings (which suggests a lack of generalization of training); and (c) the ability to emit appropriate interpersonal behavior in a naturalistic settings, but a failure to do so (which suggests the presence of relevant skills, displays of which are suppressed by the presence of some inhibiting factor, such as an emotional state provoked by natural setting conditions).

Included among the techniques that Linehan (1993a) employs in the assessment and strengthening of skills in borderline patients are therapist modeling and role-playing of problematic situations. Role-playing has also been described as a technique by Beck et al. (1990) for assessing the extent to which a client can generate adaptive responses to maladaptive automatic thoughts. Turkat (1990) describes the use of role playing with feedback to assess therapeutic gains in teaching empathy skills to histrionic clients.

4.4. Use of collaterals

One behavioral assessment method, participant-observation, involves the observation and recording of target behaviors by persons who are a part of the client's naturalistic environment. As such, participant observers may serve as ideal observers of the client's target behaviors in the very environments where maladaptive behavior is most common or problematic. Like other forms of observational methodology, however, participant-observation is not without its problems, as participant-observers may be non-compliant with data collection procedures, may produce unreliable data, or may evoke reactive changes in either their own or the client's behavior (Hay, Nelson, & Hay, 1980; Jarrett & Nelson, 1984).

Since many of the criterion behaviors used to define PDs tend to be either socially undesirable or require insight or objectivity to self-observe (qualities which some suggest are antithetical to the concept of PD), there is a risk that clients with PDs may not accurately report their behaviors. Consequently, collaterals or observers familiar with the client may potentially yield more accurate data on client behavior and behavior change than information gained from patient interviews or self-report questionnaires.

Two studies have examined the degree of concordance between patient and collateral reports of patient PD symptomatology. Zimmerman, Pfohl, Coryell, Stangl, and Corenthal (1988) administered the Structured Interview for DSM-III Personality Disorders (SIDP; Stangl, Pfohl, Zimmerman, Bowers, & Corenthal, 1985) to both patients and knowledgeable collaterals. A low degree of concordance was found between diagnostic decisions reached from information

derived from these two sources (average kappa = 0.13 for all PDs). Similar findings were reported by Riso, Klein, Anderson, Ouimette, and Lizardi (1994). These researchers administered the Personality Disorder Examination (PDE; Loranger, 1988) to both patients and collaterals, with the resulting median kappa based on PD diagnostic concordance being −0.01. Interestingly, in the Zimmerman et al. (1988) study, informants' reports of the patients' behaviors tended to be more pathological than those of the patient, whereas the reverse trend was noted in Riso et al. (1994). Furthermore, in Riso et al. (1994), reports by friends as compared to those by family members tended to yield greater agreements with patient reports, suggesting that the relationship that the patient shares with the collateral may be an important determinant of agreement.

At present, it remains unclear as to the types and sources of bias that may account for inconsistent reports between patients and collaterals, and which of these sources yields more accurate data. Consequently, the use of participant-observers in the assessment and treatment of PDs should be undertaken with some degree of caution.

4.5. Self-monitoring

Self-monitoring is a frequently used assessment technique in cognitive and behavioral therapies. Contributing to its popularity as an assessment method is its applicability for a wide range of clients and for a wide range of problems (Barlow, Hayes, & Nelson, 1984). In self-monitoring, the client discriminates some aspect of his or her behavior and then records it. Self-monitoring alone has therapeutic value, as it has frequently been observed to result in behavioral change, often in desirable directions (Nelson, 1977).

Cognitive therapies for PDs (Beck et al., 1990; Layden et al., 1993; Young, 1994) often employ self-monitoring methods as a way of detecting automatic maladaptive thoughts. The Daily Thought Record (DTR) is one such assessment device. On the DTR, the client is asked to describe: (a) a situation or event that led to an unpleasant emotion; (b) the emotion itself; (c) the automatic thoughts that preceded the emotion, and (d) a rationale response to irrational or maladaptive automatic thoughts. For those with PDs, DTRs can be particularly useful in helping clients identify maladaptive views of oneself or others, distinguish between realities and fantasies, promote more accurate attributions associated with cause and effect relations, and aid in the identification of characteristic distortions or misperceptions of events (Beck et al., 1990).

Linehan (1993a, b) describes several self-monitoring methods used in her dialectical behavior therapy (DBT) for borderline PD. One example is the DBT Diary Card. The Diary Card lists several behaviors targeted for intervention (e.g., use of alcohol and drugs, instances of parasuicidal acts or suicidal ideation), with the patient instructed to complete this card each day. In addition to indicating if the target behavior had occurred, patients are also asked to specify the frequency with which the behavior occurred, the amounts of alcohol and drugs consumed, and the degree to which suicidal ideation or the urge to self-harm was present. Patients also provide ratings indicating whether behavioral skills were used to cope with urges surrounding these targeted behaviors, as well as the usefulness of these skills in coping with such urges.

5. Summary

Although trait and mental illness connotations implied in the term 'personality disorder' suggest an organizing theoretical framework discordant with that of behavioral assessment, this article suggests that a behavioral framework can be compatible with and useful in the conceptualization and assessment of PDs and associated features. Additionally, in contrast to the nomothetic intervention strategies which may be implied by psychiatric diagnosis, behavioral assessment has the potential to facilitate therapeutic change for the individual by suggesting idiographic controlling variables responsible for the maintenance of maladaptive behaviors associated with PD concepts.

Acknowledgements

The authors would like to thank Matthew Berent, Janice Howard, Heather Nash, Mark Roberts, and the Nelson-Gray lab group for comments on earlier drafts of this article.

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