A Comment on Drash and Tudor's (2004) Operant Theory of Autism

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The authors comment on Drash and Tudor's operant theory of autism. Concerns with the theory's face validity and empirical support are presented, along with concerns about four aspects of the theory.

Drash and Tudor (2004) present a behavior-analytic theory of the behaviors central to the diagnosis of autism. This theory is an extension of their earlier article on the environmental determinants of language delay (Drash & Tudor, 1993). Drash and Tudor's (2004) current theory is based on six contingency paradigms that might give rise to autistic behaviors. The paradigms are based on the notion that autistic behavior can be traced back to deficits in verbal behavior and the deleterious effects of disruptive behavior. The authors also present behavioral analyses of the relation between verbal-behavior deficits, social-behavior deficits, and disruptive behavior.

We commend Drash and Tudor (2004) for publishing what appears to be the most detailed behavioral analysis of the etiology of autism. Unfortunately, discussions of the potential environmental determinants of autism are scarce, although there is no question that operant contingencies are involved in the acquisition and maintenance of autistic behavior. These discussions have probably been limited due to political correctness following the detrimental effects and discrediting of the earlier psychogenic theory of autism (Harshman, 2003; Roazen, 1992). We also agree with Drash and Tudor that an environmental analysis of autistic behavior might lead to technological advances (e.g., behavioral preventative efforts, nationwide behavioral screening networks, earlier treatment delivery) that would not be possible based on a purely neurological account.

Despite our appreciation of Drash and Tudor's (2004) intentions, we have a number

of concerns with the presentation of their theory to the scientific community and with some of its core features. These concerns are presented below.

CONCERNS WITH THE THEORY'S PRESENTATION

Any non-biological theory on the etiology of autistic behavior has an extremely high burden of proof if it is to be seriously considered by the general scientific community. Although a single neurological causal agent has not yet been clearly identified, there is mounting evidence to support the predominant assumption that autism has neurological origins (Eigsti & Shapiro, 2003; Nicolson & Szatmari, 2003). Drash and Tudor (2004) do not fully acknowledge the extent of this evidence. We believe that a behavioral theory must generate at least as much evidence as exists for neurological theories to be convincing. The burden of proof may be even greater for behavioral theories because of the detrimental effects of the earlier psychogenic theory of autism (Bettleheim, 1967; Eisenberg & Kanner, 1956). Szatmari (2003) asserted "the distress caused by these claims is a painful reminder of the need for evidence based information on causation for all parents who have children with developmental or psychiatric disorders" (p. 173).

We believe that Drash and Tudor's (2004) theory has limited face validity because the level of environmental deviance necessary to produce autistic behavior without an underlying neurological deficit seems unlikely to reliably occur. Without face validity, there is a minimal chance the general scientific community will accept the theory. An etiological theory must stimulate research, application, and theoretical extension by this community if it is to ultimately prove useful. Several published be-

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havioral theories have failed to produce such an impact despite relatively greater face validity due to their acknowledgment of a probable neurological originating factor (e.g., Bijou & Ghezzi, 1999). It would appear that without face validity, extensive empirical support would be needed before any radical-environmental theory could stimulate additional scientific behavior.

Although Drash and Tudor (2004) provide some evidence for their theory, their data do not meet the standards they use to evaluate neurological theories (i.e., "conclusive evidence" of causation). Each of their paradigms could possibly result in autistic behavior, but no causal evidence is presented. Their theory is based on anecdotal evidence from their clinic (although each case was reportedly exposed to rigorous single-case experimentation) and much of this evidence involved selective reports of parents. Without a larger number of participants and a non-autistic control group, a selection bias likely exists for their anecdotal reports. In addition, the authors infer behavior-environment relations that occurred during infancy from a child's repertoire in early childhood without the benefit of direct-observation evidence of causality. Because of the reciprocal interaction between child and caregiver behavior, it is unclear whether caregiver behavior observed when a child is a toddler caused or resulted from the child's behavior, or both.

Although the data presented by Drash and Tudor (2004) do not convince us, more compelling data could be gathered because the authors' paradigms are based on directly observable caregiver-child interactions. The first step in this line of research would likely be retrospective interviews with parents of autistic children and a comparison group of parents of non-autistic children. If the groups differed on the key interactions critical to Drash and Tudor's paradigms, then more rigorous, longitudinal, direct-observation data would need to be collected. That evidence would need to indicate that the parents of children with autism behave differently than parents of non-autistic children in the ways purported by the theory. Admittedly, this would be effortful. However, we believe such evidence of causality should be collected *before* a behavioral theory is presented because (a) previous behavioral theories without such data produced little impact,

and (b) environmental theories of autism have sensitive implications.

CONCERNS WITH THE THEORY

Our criticisms of Drash and Tudor's (2004) theory are presented below.

The Core Deficit of Autism

Drash and Tudor (2004) propose that verbal-behavior deficits are the foundation of all deficits associated with autism; however, published data suggest that the core deficit is instead social in nature. The predominant view within the autism literature is that social deficits (e.g., lack of joint attention) preclude the acquisition of verbal behavior by dramatically limiting language-learning opportunities. In accordance with this view, the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV;* American Psychiatric Association, 1994) requires twice as many deficits in the social domain as in the communication domain for the diagnosis of autistic disorder. Further, all of the pervasive developmental disorders (e.g., autism, Asperger's disorder) share core social deficits and stereotyped behaviors, but do not all include language impairments.

Drash and Tudor (2004) cite recent studies showing that autism can be identified as early as eight months to support their notion that defective verbal-behavior contingencies operating in the first year of life could result in an aberrant repertoire. However, the predictive factors identified in many of these studies are primarily social or social-communicative in nature. For example, Baron-Cohen, Cox, Baird, Sweetenham, and Nighingale (1996) showed that at 18 months, three social-behavior items (i.e., protodeclarative pointing, gaze monitoring, pretend play) on the Checklist for Autism in Toddlers were the most predictive of autism. Similarly, Robins, Fein, Barton, and Green (2001) showed that 6 items on the Modified Checklist for Autism in Toddlers best discriminated between children with and without autism. These items were mostly social in nature: joint attention (protodeclarative pointing, following a point, bringing objects to show parent), social relatedness (interest in other children, imitation), and communication (responding to name). In a video analysis study, Baranek (1999) identified several motor (e.g., unusual

posturing) and social behaviors (e.g., less object play, social touch aversion) in 9- to 12-month-old infants that differentiated children with autism from other children.

Epidemiological Phenomena

There are at least three important epidemiological characteristics of autism that are not accounted for by Drash and Tudor's (2004) theory. First, 3 to 4 times more males than females are diagnosed with autism (Wing & Gould, 1979). The authors provide no rationale for why parents would differentially shape autistic behavior in their male children rather than female children. Second, autism has one of the highest concordance rates for monozygotic twins, while the concordance rate for dizygotic twins is the same as for non-twin siblings (4.5%). The concordance rate for autism among monozygotic (identical) twins is 60% and, if broadened to include all of the pervasive developmental disorders, increases to 90% (Veenstra-Vanderweele & Cook, 2003). By comparison, the concordance rate for schizophrenia is only 48% for monozygotic twins (Onstad, Skre, Torgersen, & Kringlen, 1991). These data clearly support the substantial role of heritability in the etiology of autism. They also clearly indicate that many parents with other typically developing children also raise children with autism. Drash and Tudor's theory would need to account for the fact that the same parents produced an autistic repertoire in one child but not in their other children. Although we do not dispute the fact that autistic behavior is maintained by its consequences, we believe these concordance data need to be directly addressed by any etiological theory. Third, up to 50% of parents indicate that their children were typically developing (i.e., spoken language, pointing, interactive play, imitation) until a developmental regression between the ages of 18 and 24 months (Tuchman & Rapin, 1997). The most common forms of regression are loss of verbal and nonverbal behavior and loss of nonverbal behavior alone (Goldberg et al., 2003). Drash and Tudor's theory does not account for regressive-type autism, and thus, does not account for perhaps up to 50% of cases.

Extinction of Verbal Behavior

Drash and Tudor's (2004) fourth paradigm

is the extinction of a child's verbal behavior. The authors suggest that placing children in an environment in which verbal behavior is not reinforced might result in a language delay that could lead to further autistic behavior. As illustration of this possibility, the authors discuss the fact that many children today are placed in daycare in which child-to-adult ratios are considerably lower than at home. This potentially incendiary statement is a faulty premise. Published data indicate that quality and type (i.e., center versus home) of child care have little impact on children's long-term development (Scarr, 1997). Further, epidemiological statistics would indicate that only a miniscule number of children placed in daycare become autistic and not all autistic children are placed in daycare. Although it is possible that a child's environment, either home or daycare, might be unresponsive to his or her vocalizations, there are data based on direct observation that parents of children with autism are just as responsive to their children's attention and activities as parents of typically developing children with similar language skills (Siller & Sigman, 2002).

Disruptive Behavior

Drash and Tudor (2004) heavily emphasize the existence of disruptive behavior among children with autism, describing it as a core feature. Three of their four basic premises and 2 of their 6 paradigms are based on the accidental shaping of disruptive behavior and its detrimental effects on learning. However, disruptive behavior is not unique to autism and is often seen in other populations (e.g., typically developing children, children with mental retardation). It is therefore unclear how disruptive behavior, which is not unique to children with autism, can serve as the basis for the disorder. Stereotypic behaviors, however, are more prevalent in individuals with autism compared with other disabilities (e.g., Bodfish, Symons, Parker, & Lewis, 2000) and are included in the *DSM-IV* criteria for pervasive developmental disorders. Drash and Tudor describe how automatically reinforced repetitive behaviors might be transformed into socially maintained behavior, but epidemiological data suggest that stereotypic behaviors are predominantly non-social in nature (Iwata, Roscoe, & Shore, 2002). To fully account for the unique

aspects of disruptive behavior in autism, an etiological theory would need to more effectively explain why children diagnosed with autism are more likely to develop non-socially mediated disruptive behaviors than children with other disabilities in which language is also disordered (e.g., mental retardation). The theory would also need to account for the development of complex repetitive and ritualistic behaviors in higher functioning children with autism and children with Asperger's disorder who have functional verbal repertoires.

CONCLUSION

Drash and Tudor (2004) are to be commended for providing such a detailed behavioral analysis of the possible determinants of autistic behavior. Too little attention has been paid to the earliest years of children with autism and we believe that such careful attention has the potential to make a substantial contribution. Unfortunately, the theory proposed by Drash and Tudor suffers from a lack of compelling evidence, without which the likelihood of the theory rising above an academic exercise is low, as it has been for earlier behavioral theories. In addition, the theory does not address existing data on the critical role of social behavior in the development of autistic behavior and the effects of child care on early development. Perhaps more important is the fact that the theory does not account for sex differences in autism, its extremely high concordance rate, and developmental regression patterns. Although the authors clearly stated that their theory did not represent the only explanation for autism, by not addressing existing evidence the remaining cases left for the theory to explain are greatly reduced. As the authors noted, conceptualizing autism as a contingency-shaped disorder has a number of important practical implications. However, we believe that a revision of the current theory and substantial supportive data are necessary before these implications can be realized.

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