Introduction: Translational Science Lectures

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Among the most significant trends in science over the past decade is one toward translational research—work that spans the continuum from laboratory science to practical application. The translational model, sometimes also known as “bench to bedside,” seeks to build bridges across research areas and disciplines, promoting cross-fertilization of ideas. Much of the best work in behavior analysis is of this translational character. To highlight this research in behavior analysis, a special program track at the 2009 Association for Behavior Analysis International (ABAI) convention was created. Cosponsored by the ABAI Practice and Science Boards, the keynote events in this special track were two sessions—one on stimulus control in autism and one on behavioral momentum—with the contributing authors invited to submit papers for publication in *The Behavior Analyst*. The result is the present collection of papers.

Stimulus Control in Autism

In the early days of autism research and practice, consequence strategies for increasing skills and decreasing behavioral challenges were emphasized (Ferster, 1961). Lovaas's earliest autism work employed simple discrimination procedures drawn directly from the laboratory (Lovaas, 1967). However, even in the early years it was recognized that autism is distinguished by unusual responses to

antecedent stimuli (Lovaas & Schreibman, 1971). It is widely recognized today that lack of control by, and inappropriate responses to, antecedent stimuli are important distinguishing features of autism (American Psychiatric Association, 1994, p. 72). Specifically, children and youth with autism may exhibit no spoken language in response to social or language stimuli emanating from others, or may fail to respond to symbolic meaning of words or other symbols (American Psychiatric Association, 1994, p. 75).

McIlvane's paper examines translational behavior analysis, linking nonhuman laboratory research on complex stimulus control procedures to studies with individuals with autism and other developmental disabilities. Based on matching-to-sample methodology originally developed by Sidman and Tailby (1982), McIlvane, Dube, and colleagues have conducted extensive research demonstrating that many individuals who had heretofore been believed to be incapable of developing symbolic language skills, could be taught such skills (McIlvane et al., in press). Their methods derived directly from nonhuman laboratory research and laboratory research with individuals with developmental disabilities. McIlvane argues that translational behavior analysis is a two-way street, with knowledge generated by applied research feeding back and enriching subsequent laboratory investigations.

Koegel, Shirotova, and Koegel examine a problem practitioners in schools and home-based therapy settings often encounter when working with young children with autism

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(Koegel & Koegel, 2006). Even after prolonged attempts to promote spoken language using recommended interventions, speech may not emerge. In this study, they presented nonverbal children with autism with individualized orienting cues immediately prior to verbal models in order to increase discriminative responding as well as first-word acquisition. The 3 children showed improvements in their functional word acquisition following the orienting cue intervention, with 2 children showing particularly large gains. Following intervention, the 2 highest functioning children used a wide array of different words and showed continued improvement at a 6-month follow-up. These children, whose prognoses had been considered doubtful with respect to developing spoken communication, were able to acquire speech with a novel antecedent stimulus manipulation.

Thompson has written elsewhere about the value of combining basic and applied science knowledge and strategies in *Making Sense of Autism* (Thompson, 2007a). Although the present papers are focused on behavior analysis, there may also be advantages of integrating behavior analysis with neuroscience concepts (Thompson, 2007b).

Behavioral Momentum

Beginning with Nevin's groundbreaking work in the 1980s, behavioral momentum concepts have provided a rich theoretical and analytic context for understanding the dynamic relations among stimuli, reinforcers, and behavior. In addition to stimulating an expanding body of laboratory research, momentum concepts have provided important insights into the maintenance of behavior in applied settings. Of particular relevance to applied work is the problem of behavioral persistence—the conditions under which behavior established in one setting continues in other settings—about which behav-

ioral momentum makes explicit predictions. Specifically, momentum theory predicts a direct relation between persistence and reinforcement density, irrespective of whether those reinforcers are response dependent or response independent.

Nevin's paper provides an overview of key concepts in momentum theory, focusing on the effects of response-independent reinforcement, known in applied settings as noncontingent reinforcement (NCR). Although used efficaciously for years in the applied realm to reduce problem behavior, NCR in some cases may actually make problem behavior more resistant to change. This outcome has been observed in laboratory research and is predicted by momentum theory.

If left at this point, NCR may produce unintended and counterproductive outcomes in the applied realm. The paper by Mace et al. takes the analysis one step further, showing how these unintended effects of NCR can be overcome by reinforcing alternative behavior incompatible with the problem behavior. The analysis is distinctive in its melding of laboratory and clinical work, illustrating the bidirectional interplay of translational research in behavioral momentum.

The paper by McComas also concerns an analysis of persistence of problem behavior (aggression, self-injury) and prosocial behavior (compliance), conceptualized as concurrent operants. A major challenge in programming for generalization is to selectively increase persistence of prosocial behavior without also increasing persistence of problem behavior. McComas describes an effective set of methods, using concepts from momentum and stimulus control, for treatment of negatively reinforced behavior in an applied setting.

Together, the papers illustrate how momentum concepts have inspired new conceptualization and treatments of problem behavior in applied

settings. Such findings not only expand the generality of momentum theory but also suggest important new research avenues.

Conclusion

The field of applied behavior analysis emerged from the experimental analysis of behavior, like Adam's rib, but the relationship between the two subdisciplines has increasingly become distant. Applied behavior analysis has often become technique driven, rather than relying on basic principles to guide intervention development. The papers presented here exemplify a conceptually driven translational approach to research and application. Such bridging research brings analysis to the forefront, ensuring that application is based on cutting-edge science, while at the same time bringing applied problems back to the laboratory.

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