

## **Effects of Positive and Negative Reinforcement in a Concurrent Operants Arrangement on Compliance and Problem Behavior**

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### **Abstract**

Functional analysis (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994) is a robust approach to identifying function-based interventions for problem behavior, including self-injury, aggression, and destruction. Such interventions, however, may be difficult for untrained caregivers to implement with fidelity in natural environments. Further research is needed to identify simple antecedent strategies for promoting appropriate behavior among children with significant problem behavior. The purpose of the current study was to utilize a concurrent schedules arrangement to identify conditions under which two children with autism spectrum disorder (ASD) and developmental delays who engaged in problem behaviors would choose to complete academic tasks to earn access to preferred items. In both cases, problem behaviors were shown to be sensitive to reinforcement in the forms of escape from task demands and access to preferred items. A concurrent operant arrangement in which the participants could choose to complete work tasks to earn access to preferred activities, or to take a break without demands or preferred items, was implemented. The schedule requirements in the demand component were systematically increased across opportunities, while the amount and type of reinforcement was kept constant. The results show, at the lowest levels of task demands, both participants allocated more opportunities to the work option. At higher levels, however, both participants allocated a majority of their choices to the break option. Despite the absence of preferred items in the break component, no instances of problem behavior were observed following selection of the break option. This indicates that this type of analysis could be used to identify conditions for compliance among individuals who engage in escape- or multiply-maintained problem behaviors, without the need to provoke or reinforce problem behavior. Limitations of the current study and recommendations for future research are discussed.

*Keywords:* Problem Behavior, Compliance, Positive and Negative Reinforcement.

### **Efectos del Reforzamiento Positivo y Negativo en un Arreglo de Operantes Concurrentes sobre la Obediencia y la Conducta Problemática**

#### **Resumen**

El análisis funcional (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994) es una aproximación robusta para identificar intervenciones basadas en la función para la conducta problemática, incluyendo la autolesión, agresión y destrucción. Tales intervenciones, no obstante, pueden ser difíciles de implementar fidedignamente en escenarios naturales por cuidadores no entrenados. Se requiere más investigación para identificar estrategias antecedentes simples para promover la conducta apropiada entre niños con problemas significativos de conducta. El propósito del presente estudio fue utilizar un arreglo de programas concurrentes para identificar las condiciones bajo las cuales dos niños con trastorno del espectro autista (ASD, por sus siglas en inglés) y retraso en el desarrollo que emitían conducta problemática escogerían completar tareas académicas para ganar acceso a ítems preferidos. En ambos casos, las conductas problemáticas fueron sensibles al reforzamiento consistente en escape de las demandas de la tarea y en acceso a ítems preferidos. Se implementó un arreglo de programas concurrentes en el que los participantes podían escoger entre completar una tarea académica para ganar acceso a ítems preferidos o tomar un descanso sin demandas y sin ítems preferidos. Los requisitos del programa en el componente de demanda fueron incrementados sistemáticamente a través de las oportunidades de elección, mientras que el tipo y cantidad de reforzamiento se mantuvo constante. Los resultados mostraron que en el nivel más bajo de demandas, ambos participantes prefirieron la opción de trabajo. A niveles de demanda más altos, no obstante, ambos participantes eligieron la opción de tomar un descanso. A pesar de la ausencia de ítems preferidos en el componente de descanso, no se observaron instancias de conducta problemática después de esta opción. Esto indicó que este tipo de análisis puede ser usado para identificar condiciones que conducen a la obediencia entre individuos cuya conducta problemática se mantiene por escape o bien por múltiples reforzadores, sin la necesidad de provocar o reforzar la conducta problemática. Se discuten las limitaciones del presente estudio y se ofrecen recomendaciones para futura investigación.

*Keywords:* Conducta Problemática, Obediencia, Reforzamiento Positivo y Negativo.

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Functional analysis (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994) permits identification of functional relations between problem behavior, including self-injury, aggression, and destruction, and its consequences. Determining the function of problem behavior, in turn, facilitates altering the relevant reinforcement contingencies to decrease problem behavior and increase appropriate behavior (Steege, Wacker, Berg, Cigrand, & Cooper, 1989). For example, treatment for negatively reinforced behavior often includes escape extinction, reinforcement of alternative, appropriate behavior (contingent on alternative behavior or noncontingent), or a combination of both (e.g., DRA, DRO; Vollmer, Marcus, & Ringdahl, 1995; Wacker et al., 1990). With any intervention, its effectiveness depends on the fidelity with which it is implemented. Consequence-based interventions such as extinction or differential reinforcement may be particularly difficult for parents, teachers, or other caregivers to implement with adequate fidelity, especially if the target behavior is frequent or of such severity that it is challenging or impossible to ignore. When the problem behavior includes aggression or self-injury, procedures that might produce a side effect such as an extinction burst may be inappropriate. However, research has shown also that positive reinforcement in the form of access to preferred items or activities, can be effective for improving problem behavior that is maintained by negative reinforcement or multiple functions (i.e., positive and negative reinforcement) (Payne & Dozier, 2013). Importantly, the effectiveness of positive reinforcement for reducing negatively reinforced and increasing appropriate behavior has been demonstrated even in the absence of extinction (Lalli et al., 1999).

One strategy that shows promise in assessing the effects of access to preferred items or activities on behaviors maintained by negative reinforcement is the use of concurrent schedules. Several studies have used concurrent schedules to examine the effects of manipulations of both positive and negative reinforcement on problem behavior and task completion. For example, Golonka, Wacker, Berg, Derby, Harding, and Peck (2000) provided two participants with negatively reinforced problem behavior to choose between continued work or taking a break during demanding tasks. In an alternating treatments design, the effects of providing access to preferred items during the break (combined negative and positive reinforcement condition) were compared to the effects of a break without preferred items (negative reinforcement alone). The combined condition resulted in greater reductions in problem behavior and increases in appropriate requesting. Nevertheless, escape extinction was necessary to increase completion of task demands without problem behavior for both participants.

Similarly, Piazza, Fisher, Hanley, Remick, Contrucci, and Tammera (1997) compared the effects of negative reinforcement with combined positive and negative reinforcement, with and without extinction. Three participants with multiply maintained problem behavior participated. They demonstrated that, for two participants, providing breaks with preferred items contingent on appropriate behavior was effective for decreasing problem behavior and increasing compliance without escape extinction. For the final participant, however, escape extinction was necessary. When the schedule of reinforcement for appropriate behavior was

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