

# Evaluation of “Rebound” Effect on Rate of Tics in Persons with Tourette’s Syndrome

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## ABSTRACT

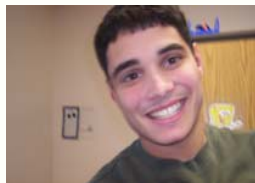
Tic disorders are defined as involuntary, recurrent, vocal or body movements. The etiology of tics is not yet proven, but there is a belief that they are neurologically based, with some influence by the external environment. Although there is general agreement that some people diagnosed with tic disorder can exert some suppressive control over their tics, there is a belief that doing so results in a “rebound” effect, wherein an increase in tics will be noted after such suppression is terminated. The purpose of this study was to examine whether or not a rebound effect occurred. Two subjects with multiple diagnoses and tic disorder were studied. Baseline rates of tics were established, and then experimenters alternated conditions of verbal instructions to suppress tics and a Differential Reinforcement of Other Behavior, using money as reinforcement. A rebound effect was noted in one subject but not the other. Results were discussed in terms of variables that could influence the occurrence of a rebound effect and other methods for diagnosing and treating tics.

## SETTING

- Residential school for students with developmental disabilities
- Sessions conducted in a room with table and chairs.
- A video camera in room, but out of reach of the students.
- Materials for all conditions placed under the table out of sight and reach of the students.
- Preferred activities for the control and attention conditions selected by discussing with staff materials that subjects sought out during free time.

## SUBJECTS

- Cory -17 year old
- DSM-IV criteria for TD
- Residential treatment program; lived with 7 other students, also with a multitude of disorders
- Able to converse and understood delayed reinforcement procedures
- Cory’s motor tics:
  - (a) quick finger, hand, or arm movements (did not include instances such as swatting at a fly);
  - (b) repetitive or rhythmic movements occurring for at least 2s;
  - (c) placing fingers on top of each other (e.g., crossing them for at least 2s);
  - (d) object manipulation (e.g., flicking pen back and forth in fingers, but not adjusting the pen to hold it correctly);
  - (e) covering face with his arm or hands (did not include holding his hand or arm up to cover a sneeze);
- Christopher – 21 year old male
- DSM-IV criteria for Tic disorder NOS, as a result of Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections (PANDAS)
- Chris’ tics included:
  - Facial tic-mouth “pop”, defined as any nonfunctional occurrence of his mouth snapping opening (with or without sound).
  - Motor tic-a nonfunctional rigid bending of two or more fingers on one or both hands, typically in the form of a claw-like position.



## DEFINITION OF TICS

- DSM-IV: Tourette’s Disorder (TD) is a neurobiological disorder marked by involuntary vocal and/or motor sounds or movements.
- Idiopathic-eye blinking, picking movements, head or arm jerking, throat clearing, or sniffing.
- Complex tics-facial grimacing, arm flapping, jumping, shaking, poking others, kissing others, spitting, echolalia, and palilalia.
- Tics must be differentiated from other movement disorders (i.e. stereotypy, dystonia, and chorea).
- Tics typically occur as sudden, rapid movements during normal activity.

## METHOD

- Sessions - 5 minute durations, with 3 minute intersession breaks
- Measurement – 5s partial-interval recording

### Baseline

- Rate of tics measured during normal conversation between teacher and subject

### Verbal Instruction (VI) condition

- Experimenter told subject, “For the next 5 min I want you to do whatever you have to do to keep your tics from happening. I will not talk to you during this time, but try not to tic.”

### Rebound Assessment

- At the end of the five minute session a 3 min. break was delivered where subjects and the experimenter talked about various every day happenings. Rate of tics measured.

### Differential Reinforcement of Other Behavior (DRO) condition

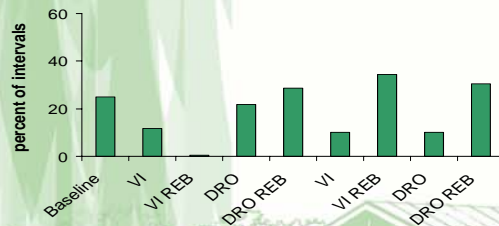
- Experimenter told subject, “For the next 5 min I will give you a penny for every 10s that you do not tic. I will not talk to you during this time, but do whatever you can do to keep your tics from happening. When we are all done you will be able to trade your pennies in for an item of your choice.”

### Rebound Assessment (as above)

## DESIGN

Reversal design:Baseline, VI, DRO, VI, DRO

Christopher



## RESULTS

- Cory
  - Initial VI condition, Cory was not able to suppress his tics.
  - In first DRO condition, Cory reduced the frequency of tics by 40%; increased again during the second VI condition.
  - Second DRO condition showed a decrease in tics. No condition neared baseline.
- Chris
  - Percentage of tics for Chris increased during the rebound sessions where he and staff discussed every day happenings.
  - Low levels of tics can be seen in the VI and DRO sessions.

## DISCUSSION

- Reinforcement may alter symptom presentation in a disorder primarily believed to be neurologically based.
- Only two studies have researched rebound effect of tics.
- The function may be related to whether there is a rebound effect:
  - Undifferentiated results suggest true tics.
  - Differentiated results indicate environmentally controlled behavior.

Cory

