

# Spontaneous eye-blinking and stereotyped behavior in older persons with mental retardation

Amanda M. Roebel<sup>\*</sup>, William E. MacLean Jr.

*Department of Psychology, University of Wyoming, Laramie, WY 82071, USA*

Received 14 October 2004; received in revised form 27 September 2005; accepted 14 October 2005

---

## Abstract

Previous research indicates that abnormal stereotyped movements are associated with central dopamine dysfunction and that eye-blink rate is a noninvasive, *in vivo* measure of dopamine function. We measured the spontaneous eye-blinking and stereotyped behavior of older adults with severe/profound mental retardation living in a state mental retardation facility. Analyses revealed that the mean eye-blink rate of the residents that engaged in stereotypy was significantly lower than the rate for residents who did not exhibit stereotypy. Moreover, the stereotypy group also demonstrated greater variability in interblink intervals. These results provide further empirical support for the involvement of dopamine in stereotyped behavior and are consistent with an emerging motor control model of stereotypy.

© 2005 Elsevier Ltd. All rights reserved.

*Keywords:* Eye-blinking; Stereotypy; Mental retardation; Dopamine

---

Stereotyped behavior is common among people with mental retardation, particularly those who function within the severe/profound range (Baumeister, 1978). Although many explanations have been offered regarding the origin of stereotyped behaviors (Baumeister, 1978), considerable evidence supports a physiological basis (Lewis, Gluck, Bodfish, Beauchamp, & Mailman, 1996). Converging evidence from animal and clinical studies implicates the involvement of the dopamine system in stereotypy (Lewis, Gluck, Beauchamp, Keresztury, & Mailman, 1990; Lewis, Gluck, et al., 1996).

Two measures of dopamine function have been used in studies of stereotypy exhibited by people with mental retardation. Lewis, Bodfish, et al. (1996) assessed central dopamine function through measurement of plasma concentrations of the dopamine metabolite homovanillic acid

---

<sup>\*</sup> Corresponding author. Present address: University of Wyoming, Department 3415, 1000 E. University Avenue, Laramie, WY 82071, USA. Tel.: +1 307 399 4492.

*E-mail address:* [roebel@uwyo.edu](mailto:roebel@uwyo.edu) (A.M. Roebel).

(HVA). Individuals who engaged in high rates of body rocking were found to have significantly lower levels of plasma HVA in comparison to control participants. This finding provides biochemical evidence of dopamine deficiency in relation to stereotyped behavior. Researchers have also utilized spontaneous eye-blink rate as an indirect measure of dopamine functioning. In general, people with mental retardation who exhibit frequent stereotyped behavior have significantly lower eye-blink rates than matched controls who do not exhibit stereotypy (Bodfish, Powell, Golden, & Lewis, 1995; Lewis, Bodfish, et al., 1996; MacLean et al., 1985). Moreover, there is a significant inverse correlation between time spent engaged in stereotypy and eye-blink rate (MacLean et al., 1985). These findings support the hypothesis that a hypodopaminergic state, and possibly dopamine receptor supersensitivity, is responsible for the stereotyped behavior of these subjects (Lewis, Gluck, et al., 1996).

Related research on postural stability of people who exhibit stereotyped behavior reveals a profile of motor control characterized by greater amplitude and variability in postural adjustment movements than matched controls (Bodfish, Parker, Lewis, Sprague, & Newell, 2001). This profile of postural instability is highly suggestive of basal ganglia disorder in general and dopamine deficiency in specific. Bodfish et al. argue that a motor control model of stereotypy can account for both the occurrence of stereotyped movement disorder and deficiencies in goal-oriented motor actions such as postural stability. The emerging motor control model of stereotypy, articulated by Bodfish et al., suggests that other motor behaviors, such as spontaneous eye-blinking, might also be characterized by greater variability among people who exhibit frequent stereotyped behavior. The current study was conducted to replicate previous findings regarding the low rate of eye-blinking among people who exhibit frequent stereotyped behavior and then to extend this line of work to include an analysis of variability in interblink intervals in comparison with individuals who do not engage in stereotypy.

## 1. Method

### 1.1. Participants

Participants were 22 residents (8 men and 14 women) of a state facility serving adults with mental retardation. The participants ranged in age from 30 to 85, with a mean age of 55.1 years. Twenty of these participants were functioning within the profound range of mental retardation and two in the severe range. Given the potential for neuroleptic medication (Karson, Staub, Kleinman, & Wyatt, 1981) and recent seizure activity (Bodfish, Crawford, et al., 1995; Bodfish, Powell, et al., 1995; Caplan, Guthrie, Komo, & Shields, 1998) to affect eye-blink rate, residents who had evidence of seizures or had taken antipsychotic medication in the past 6 months did not participate in the study. Similarly, residents who made frequent sustained eye contact (equal to or greater than 3 s per episode) or interacted with the observers (approached, talked to, touched) or whose eyes were not visible for at least 75% of an initial observation period were not included in the study.

Fifteen participants exhibited stereotyped behavior, while the remaining seven individuals did not. The stereotypy group was composed of 5 males and 10 females with a mean age of 52.9 years (S.D. = 13.8). Three men and four women made up the non-stereotypy group. The mean age of the non-stereotypy group was 60.0 years (S.D. = 20.9). An independent samples *t*-test revealed no significant difference in age between the two groups ( $t(20) = 2.39, p > .05$ ). Chi-square tests showed that there was no significant difference between the two groups in regard to sex ( $\chi^2(1, N = 22) = .18, p > .05$ ). Medical records indicated that one woman in each of the two groups had

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات