A Preliminary Description of the Occurrence of Proto-injurious Behavior in Typically Developing Children

Henry S. Roane, Joel E. Ringdahl, Timothy R. Vollmer, Ernest L. Whitmarsh and Bethany A. Marcus

Abstract

Self-injurious behavior (SIB) is a disorder typically associated with developmental disabilities. However, throughout early childhood, some typically developing children also display behavior that is topographically similar to SIB but does not cause injury, commonly referred to as "proto-injurious behavior" (PIB). To date, little research has examined the occurrence of these behaviors in typically developing children. In the current paper, we present preliminary data from a sample of typically developing children in the southeastern United States for whom caregivers reported the occurrence of PIB. The results are discussed in comparison to the occurrence of these behaviors in other populations and in terms of implications for understanding the developmental course of SIB.
Keywords: childhood development, descriptive questionnaire, proto-injurious behavior, self-injurious behavior

Self-injurious behavior (SIB) has been defined as an act in which an individual produces physical damage to his or her own body (Tate & Baroff, 1966). Examples of frequently observed SIB among individuals with developmental disabilities include head banging, self-hitting, self-pinching, self-scratching, pica, hand mouthing, eye poking, and hair pulling (Iwata et al., 1994; Johnson & Day, 1992). The occurrence of chronic SIB can lead to physical sequelae including hematomas, severe tissue damage, and in some cases, death. General prevalence estimates of SIB among individuals with developmental disabilities are 10 to 20% (Oliver, Murphy, & Corbett, 1987; Schroeder, Schroeder, Smith, & Dalldorf, 1978).

SIB, which is interpreted as abnormal and disruptive among individuals with developmental disabilities, may also occur in developmentally typical children. However, such behavior is rarely interpreted as abnormal or disruptive in non-disabled children primarily because it rarely produces long-term tissue damage (Hyman, Fisher, Mercugliano, & Cataldo, 1990). In many cases, such behavior is viewed as developmentally normal (Lourie, 1949; Thelen, 1979). Although the form of the behavior topographically resembles SIB (e.g., contact of the head to a hard surface), the behavior often does not resemble SIB along other dimensions (e.g., intensity, frequency), and usually requires no direct intervention. Thus, behavior of this type may be considered "non-clinical" forms of SIB. However, it is possible that some of these behavior forms have the potential to develop into clinically significant problems; thus, this class of behavior is often referred to as "proto-injurious behavior" (PIB; Berkson & Tusa, 2002).

In general, the extant literature has focused primarily on the occurrence of proto-injurious head banging in young children of typical development. For example, using questionnaires mailed to the mothers of full-term, developmentally typical infants, De Lissovoy (1961) noted the occurrence of head banging in 15.2% of 487 children. Sallustro and Atwell (1978) administered questionnaires to the parents of 525 children (aged 3 to 72 months) and noted head banging to occur in 5.1% of their sample. Similarly, Kravitz and colleagues reported the occurrence of head banging in 3.6% of a sample of 135 typically

developing children (Kravitz, Rosenthal, Teplitz, Murphy, & Lesser, 1960) and in 7% of the sample of infants less than 12 months old (Kravitz & Boehm, 1971).

Thus, in the research discussed above, the occurrence of head banging ranged from 3.6% to 15.2% of typically developing children. However, less is known about the occurrence of other topographies of PIB (e.g., self-hitting) among typically developing children. A possible exception is research conducted by Troster, Brambring, and Beelmann (1991) who presented data on the occurrence of PIB and repetitive movements in children with visual impairments. In surveys of 85 caregivers of visually impaired children ranging in age from 10 to 82 months, Troster et al. found that eye poking was the most frequently endorsed form of PIB. However, these results should be interpreted with caution in reference to children of typical development because children with visual impairments have been noted to engage in aberrant behavior directed toward their eyes relative to children without visual impairments (Berkson, 2002).

In contrast to the occurrence of PIB among typically developing children, research examining the occurrence of SIB in young children with developmental disabilities have noted multiple topographies of behavior in this population. Common topographies of SIB for young children with developmental disabilities include head banging, head hitting, self-hitting, and eye poking (Berkson, 2002; Berkson, Tupa, & Sherman, 2001; Richman & Lindauer, 2005; Symons, Sperry, Dropik, & Bodfish, 2005; Symons, Sperry, Holditch-Davis, & Miles, 2003). However, among topographies of SIB, some responses appear more common than others. For example, Richman and Lindauer reported head hitting in approximately 58% of their sample, whereas only 17% displayed eye poking. Similarly, Symons et al. (2003) reported a greater occurrence of some topographies of SIB (e.g., lip biting) relative to others (e.g., eye poking).

In addition to a relatively narrow focus on the occurrence of proto-injurious head banging in typically developing children, the existing literature on PIB among children of typical development has infrequently discussed those variables that may maintain the occurrence of PIB. However, some literature suggests factors that may be correlated with this behavior. For example, Lourie (1949) suggested a child might use head banging to produce vestibular or auditory stimulation. Sallustro and Atwell (1978) noted that head banging was most likely to occur when children were listening to music, placed alone in a crib, or when they were tired, whereas Kravitz et al. (1960) noted that head banging was most likely to occur at bedtime.

The studies conducted by Troster and colleagues provide the most detailed information regarding the situational variables associated with the occurrence of PIB. Troster et al. (1991) found that the situations associated with the occurrence of PIB and repetitive movements among children with visual impairments included: (a) when a child was bored, (b) when a child was delighted, (c) when a child was left alone, (d) when a child was excited, and (e) when a child was tired. In a follow-up study, Troster (1994) identified four factors that were highly correlated with the occurrence of PIB and repetitive movements among a similar population: situations associated with (a) concentration or demands, (b) arousal or frustration, (c) boredom or monotony, and (d) stimulation or distraction.

Several theories have been presented regarding the development and maintenance of SIB in individuals with developmental disabilities. For example, it is clear that some forms of SIB are related to chromosomal abnormalities (e.g., Lesch-Nyhan disorder; Cornelia de Lange syndrome) or variations in levels of specific neurotransmitters (Cataldo & Harris, 1982). However, the vast majority of cases of SIB, including those related to biological variables, appear to be influenced by operant reinforcement contingencies (Carr, 1977). The primary method used to identify reinforcement contingencies that maintain SIB is the functional analysis procedure developed by Iwata and colleagues (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994). Using functional analyses to assess SIB, Iwata et al. (1994)

showed that operant contingencies maintained SIB in approximately 95% of 152 individuals with developmental disabilities. Similarly, Derby et al. (1992) identified operant reinforcement contingencies that maintained problematic behavior in 74% of 79 individuals with developmental disabilities.

Kurtz et al. (2003) and Richman and Lindauer (2005) used functional analyses to identify the extent to which operant reinforcement contingencies maintained SIB in young children with various disabilities. For example, Kurtz et al. noted that a specific operant reinforcement contingency (i.e., social positive, social negative, or automatic reinforcement) maintained SIB in approximately 62% of 30 young children with mild developmental disabilities. These studies, combined with research conducted with other individuals with developmental disabilities (e.g., Derby et al., 1992; Iwata et al., 1994) suggest that operant variables play a significant role in the maintenance of SIB. To date, however, no research has examined the role of operant reinforcement contingencies in the occurrence of PIB in typically developing children.

In summary, several recent investigations have reported on the occurrence of SIB in young children with developmental disabilities and the occurrence of PIB in children of typical development. However, with the exception of the studies conducted by Troster and colleagues (Troster, 1994; Troster et al., 1991), no data address the occurrence of other common topographies of PIB (e.g., self-hitting) in typically developing children.

Based on the limited nature of previous reports, additional research on the occurrence of PIB in typically developing children is warranted. Kennedy (2002) posited that although some forms of PIB may be developmentally normal, it is possible that the repeated occurrence of these behaviors over time might encounter social reinforcement. As a result, such responses may progress from a behavior maintained by nonsocial variables to a behavior that is maintained by operant contingencies. A further evaluation of PIB in typically developing children might lead to information on how SIB is developed and maintained in individuals with developmental disabilities. Therefore, in the current investigation we developed an informal, descriptive questionnaire to gather preliminary information on the occurrence of different topographies of PIB that resembled commonly observed topographies of SIB (Iwata et al., 1994). We also sought to obtain descriptive information on the situations in which caregivers had observed the occurrence of PIB to develop hypotheses regarding operant contingencies that may maintain these behaviors.

Method

Materials. A questionnaire was developed for the purpose of examining the occurrence of different topographies of PIB in typically developing children. The questionnaire consisted of four parts. First, background information was obtained by asking informants multiple-choice questions concerning their relationship with the child (i.e., father, mother, legal guardian, other), ethnic background, marital status, parents' level of education, number of children in household, birth order of the target child, child's date of birth, child's gender, and information regarding the child's health history (e.g., history of medical complications, diagnosis of a "developmental delay").

Part two of the questionnaire assessed the occurrence of and potential sources of reinforcement for eight topographies of childhood behavior, including 5 topographies of PIB. The topographies of PIB included: (a) head banging, (b) head hitting, (c) self-hitting, (d) self-biting, and (h) eye poking. Table 1 presents operational definitions (provided to informants) of each behavior, based on Iwata et al. (1994). It should be noted that the definitions of the target behaviors do not include any mention of tissue damage caused by the behaviors. The topographies were chosen based on their prevalence in developmentally disabled populations (Iwata et al., 1994; Johnson & Day, 1992) and because they were included in prior

research on PIB in typically developing children (De Lissovoy, 1961; Kravitz & Boehm, 1971; Kravitz et al., 1960; Sallustro & Atwell, 1978; Troster et al., 1991). Caregivers were instructed to complete the questionnaire concerning the child's behavior over the 2 months prior to their reporting. Also, caregivers were instructed to complete the questionnaire only for children under the age of 60 months.

Table 1
Operational definitions of each target behavior

Head Banging	Loud, forceful contact of the child's head against wall, floor, bed, crib, or other object.
Head Hitting	Loud, forceful contact of the child's hand, foot, or knee against any part of the head, including ears.
Self-Hitting	Loud, forceful contact of the child's hand, foot, or knee against any part of the body.
Self-Biting	Closing lower and upper teeth around the child's hand, arm, fingers, or other body parts.
Eye Poking	Touching eyeball with finger, or inserting finger into eye socket.

In part two of the questionnaire, informants also were asked to report on the frequency, duration, and potential operant reinforcer for each topography of PIB. Frequency information was gathered by asking informants to rate the frequency of the behaviors on a 7-point scale (i.e., never, rarely, once per week, several times per week, once per day, several times per day, almost hourly). Duration information was gathered by asking informants to rate the duration of the behavior on a 4-point scale (i.e., not applicable, less than one minute, 1 to 10 minutes, more than 10 minutes). Frequency and duration ratings were based on the ratings used by Troster et al. (1991) and definitions for each frequency and duration rating were provided in the questionnaire. To assess the potential operant reinforcer for each target behavior, informants were asked to provide frequency and duration data on the occurrence of the behaviors in certain situations.

Each situation was worded to assess a possible operant source of reinforcement. Social positive reinforcement was assessed via the statement "I observed (target behavior) when the child wanted attention, a favorite toy, activity, person or food." Social negative reinforcement was assessed via the statement "I observed (target behavior) when the child wanted to avoid or escape a specific task or activity." Automatic positive reinforcement was assessed via the statement "I observed (target behavior) when the child was engaged in 'self-stimulation' (e.g., it is something he/she likes to do when he/she is alone; it occurs when the child is placed in his/her bed or crib during bedtime)." Automatic negative reinforcement was assessed via the statement "I observed (target behavior) when the child wanted to make him/herself feel better when he/she was uncomfortable or ill." Each of these statements (along with the frequency and duration scales) was presented along with one target behavior on each page of the questionnaire. The Appendix shows a sample page from the questionnaire.

Part 3 of the questionnaire asked informants to rate questionnaire ease or difficulty and the amount of time required to complete the questionnaire. Part 4 asked the informant to provide optional information (i.e., name, address, telephone number) if they wished to participate in future research.

Sample. The questionnaires were completed by the primary caregivers (e.g., parents, legal guardians) of a sample of typically developing children. Undergraduate students presented the questionnaires to caregivers as part of their participation in various undergraduate psychology courses. The undergraduate students were instructed to present the questionnaires to families with whom they had direct contact in the previous 6 months. The questionnaire was delivered to caregivers in a marked

envelop and was returned via the undergraduate student as the record of their class participation.

Informants (i.e., caregivers) were asked to complete the questionnaire concerning their child's behavior over the 2 months prior to their reporting. Also, informants were instructed to complete one questionnaire only for each child under the age of 5, but a caregiver could complete separate questionnaires for each of their children under the age of 5 (this did not occur). The instructions for the caregivers were as follows:

> "First, you will be asked to tell us how frequently (i.e., often) your child has displayed the target behavior in a number of different everyday situations. These situations include things like: 'When the child was hungry', or 'When the child wanted to get a favorite toy.' Second, for the same everyday situations, you will be asked to tell us the length of time you observed your child displaying the behavior."

In addition to these instructions, caregivers were informed to remember that their child may of may not display one or more of the target behaviors. They were told via the questionnaire that the display of those behaviors did not mean that there was "something wrong" with their child and that the behaviors usually go away in typically developing children.

Results

One hundred and fifty-two (152) questionnaires were initially distributed. However, some questionnaires were not returned and other questionnaires were excluded from data analysis. Questionnaires were excluded based on one of the following qualifications: (a) age of target child was greater than 60 months, (b) target child had been diagnosed with a developmental delay/disability (e.g., mental retardation), (c) questionnaire or consent form was not completed by the informant, or (d) informant responses were incongruous (e.g., frequency reported as never, but duration reported as 1 to 10 minutes). Of the questionnaires distributed, 44 were not returned and 22 were excluded from data analysis for the reasons described above. Thus, 86 surveys (56.6%) were included for analysis.

The average age of the sample was 37.3 months (range, 2 to 60 months), the majority of the sample was females (52.3%), and the principle ethnic group was Caucasian (68.6%). Of the completed questionnaires, 71 (82.5%) were completed by the child's mother, 12 (14.0%) were completed by the father, and 3 (3.5%) were completed by grandparents. No questionnaires were completed by multiple caregivers. Table 2 summarizes the demographic information obtained from the distribution of the questionnaire.

Table 2
Demographic information.

Gender	
Male	47.7% (n=41)
Female	52.3% (n=45)
Ethnic Background	
Caucasian	68.6% (n=59)
African-American	17.4% (n=15)
Asian/Pacific Islander	9.3% (n=8)
American Indian	3.5% (n=3)
Hispanic	1.2% (n=1)

The questionnaire revealed that 46.5% of the sample had engaged in at least one topography of PIB

within the 2 months prior to completion of the questionnaire. Table 3 shows the percentage of respondents who endorsed each target behavior. The most frequent topography of PIB exhibited by the overall sample was self-hitting (23.3% of respondents), whereas the least frequent topography was eye poking (9.3% of respondents). The most common form of PIB for males was self-hitting (21.9%), while the most commonly endorsed form of PIB for females was head hitting and self-hitting (each 24.4%). The least common form of PIB exhibited by males was eye poking (4.9%), whereas the least common form of PIB exhibited by females was head banging (13.3%) and eye poking (13.3%). Twenty-one respondents (24.4%) indicated their child engaged in more than one topography of PIB. An average of 1.7 topographies (range, 1 to 6 topographies) was endorsed for each child in the sample.

Table 3
Percentage of caregivers who endorsed each topography of proto-injurious behavior

	Total (n=86)	Male (n=41)	Female (n=45)
Head Banging	15.1 (13 of 86)	17.1 (7 of 41)	13.3 (6 of 45)
Head Hitting	18.6 (16 of 86)	12.2 (5 of 41)	24.4 (11 of 45)
Self-Hitting	23.3 (20 of 86)	21.9 (9 of 41)	24.4 (11 of 45)
Self-Biting	16.3 (14 of 86)	9.8 (4 of 41)	22.2 (10 of 45)
Eye Poking	9.3 (8 of 86)	4.9 (2 of 41)	13.3 (6 of 45)

The occurrence of each topography of PIB was also examined across 12-month age groups. Table 4 shows the occurrence of each form of PIB across age groups. The most frequently endorsed form of PIB for each age group was as follows: (a) 0 to 12 months, self-biting (50.0%); (b) 13 to 24 months, head banging (33.3%); (c) 25 to 36 months, self-hitting and eye poking (17.6%); (d) 37 to 48 months, self-hitting (26.9%); (e) 49 to 60 months, head hitting (25.0%).

Table 4
Percentage of proto-injurious behavior across age groups

	Age (months)				
	0-12	13-24	25-36	37-48	49-60
Head Banging	20.0	33.3	11.8	7.7	16.7
Head Hitting	40.0	22.2	11.8	7.7	25.0
Self-Hitting	30.0	22.2	17.6	26.9	20.8
Self-Biting	50.0	11.1	5.9	11.5	16.7
Eye Poking	0.0	0.0	17.6	7.7	12.5

Across all topographies of PIB, the most commonly endorsed frequency for the occurrence of PIB was “rarely” (defined as the child displaying the behavior only once or twice within the 2-month period). Table 5 shows the caregivers ratings of the frequency of each form of PIB. It should be noted, however, that greater frequencies (e.g., several times per week) were reported across all topographies of

PIB.

Table 5
Percentage of informants who endorsed each frequency rating

	Frequency					
	Rarely	Once per week	Several times per week	Once per day	Several times per day	Almost hourly
Head Banging	82.6	0.0	13.0	0.0	4.3	0.0
Head Hitting	51.9	14.8	25.9	3.7	3.7	0.0
Self-Hitting	70.0	7.5	12.5	5.0	5.0	0.0
Self-Biting	61.9	4.8	9.5	9.5	4.8	9.5
Eye Poking	81.8	9.1	9.1	0.0	0.0	0.0

The results of the informal questionnaire indicated that PIB is a relatively common occurrence among typically developing children. While this information is interesting, it may be tempered by a lack of information on the situations in which PIB is most likely to occur. Thus, we attempted to assess the potential operant reinforcement contingency for each form of PIB by having the caregivers indicate whether a given response occurred in a certain situation.

Figure 1 shows the percentage of informants who reported the variable associated with each form of PIB. Most individuals endorsed more than one variable for each topography. Of the target forms of PIB endorsed by the informants, 54.4% were reportedly related to two or more operant sources of reinforcement with the average of 1.9 sources of reinforcement endorsed for each form of PIB. Social positive reinforcement was reported as the primary maintaining variable for four of the topographies (head banging, head hitting, self-hitting, self-biting). That is, these topographies were noted to occur because they had resulted in the presentation of preferred stimulation (e.g., parental attention or a toy). Automatic positive reinforcement was endorsed most frequently for eye poking. Specifically, this topography was deemed to occur because it produced some type of stimulation when the child was alone. No differences were reported in the distribution of reported environmental events across age groups.

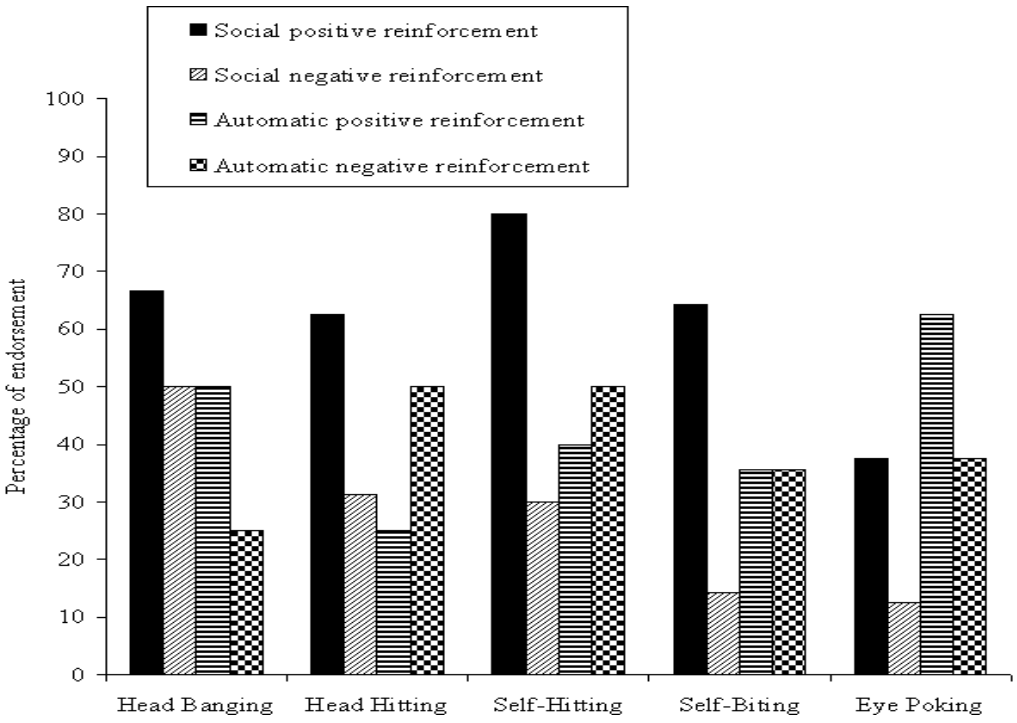

Figure 1: Percentage of informants who endorsed each operant variable in the occurrence of each topography of proto-injurious behavior.

Discussion

In the current investigation, we attempted to identify the relative occurrence of PIB among typically developing children. In addition we attempted to assess the potential operant reinforcement contingency for each target behavior by having caregivers indicate whether a given behavior occurred in certain situations. The results obtained from a descriptive questionnaire suggested that 46.5% of the sample had engaged in some form of PIB during the 2 months that preceded completion of the questionnaire. The noted target forms of PIB were found to vary across age and gender. Furthermore, the results of the current investigation suggest that the majority of PIB responses occur because they produce preferred stimulation (e.g., attention, access to toys, sensory stimulation).

The results of previous investigations and of our informal questionnaire showed higher

occurrences of PIB in typically developing children as compared to individuals with developmental disabilities (e.g., 10%-20% of individuals with developmental disabilities; Oliver et al., 1987; Schroeder et al., 1978). Although the percentage of caregivers that endorsed the occurrence of PIB in their child was surprisingly high, these results are lower than the overall occurrences reported by previous investigators (e.g., 58.5% of the sample reported by Troster, 1994). Some of the information obtained from the current questionnaire is similar to that presented by other authors. For example, De Lissovoy (1961) observed proto-injurious head banging in 15.2% of children, which compares to 15.1% of children reported in the current survey. However, these results are less similar to reports of SIB in developmentally disabled populations. For example, Berkson et al. (2001) reported head banging in one-third of their sample, whereas Richman and Lindauer reported some form of head banging in 5 of 12 cases (41.7%).

A degree of caution should be employed when comparing these findings to surveys of individuals with developmental disabilities given the data collection procedures used in the reviewed studies and in the current investigation. Specifically, the reviewed studies on PIB in typically developing children asked informants to provide descriptive information on any target behavior they had observed during their child's developmental history. Thus, an informant could indicate their child engaged in a given topography even if it had only occurred once in that child's development. Conversely, data concerning the prevalence of these topographies in individuals with developmental disabilities has been based on long-term, high frequency behaviors that cause tissue damage (e.g., Oliver et al., 1987) or on repeated observations of these behaviors (e.g., Berkson et al., 2001; Kurtz et al., 2003; Richman & Lindauer, 2005).

Differences in reporting based on the persistence of behavior over an extended period of time may be illustrated through an examination of previous research. For example, Schroeder et al. (1978) identified a case of SIB among individuals with developmental disabilities only if the behavior occurred at least once per day and at some time caused severe tissue damage. Using this definition, Schroeder et al. noted SIB to occur in approximately 10% of individuals with developmental disabilities who were observed over a 4-year period. Similarly, in their survey of PIB in typically developing children, Sallustro and Atwell (1978) included data only on those children that engaged in "persistent and intense" PIB (defined as the behavior occurring at least a few times per week). Sallustro and Atwell found occurrence estimates that were much lower (averaging 10.2% with a range of 5 to 19% depending on topography) than those observed by other investigators (e.g., De Lissovoy, 1961; Kravitz et al., 1960; Kravitz & Boehm, 1971) who applied less strict definitional criteria. Likewise, in the current investigation, different occurrence estimates emerge when the data are examined using a more strict definition of occurrence. Specifically, 10.5% of the current sample was noted to exhibit the target responses at least once per day (the stricter of the two measures used by either Schroeder et al. or Sallustro and Atwell). The resulting occurrence of PIB in 10.5% of the current sample is very similar to those estimates reported by Schroeder et al. (approximately 10%) and Sallustro and Atwell (10.2%).

It is important to note that the results reported in this review should be interpreted as descriptive. That is, the results obtained from the questionnaire in the current investigation were not validated through direct observation. Therefore, any conclusions regarding the validity of the results in relation to the actual occurrence of PIB in the population of typically developing children is limited. Similarly, the current questionnaire was not developed as a statistically derived sample of PIB in typically developing children. Additional research is required to validate the use of the current questionnaire in identifying the occurrence of PIB. It is also noteworthy that most of the reported results were based on caregiver recall, which may be subject to bias in the absence of some other form of substantiation. Another concern, particularly with the questionnaire developed for this review, is the likelihood that individuals who responded to the questionnaire may have only been those who were concerned about the safety of their child (i.e., those caregivers whose child exhibited in some type of PIB). The bias of the returned questionnaires may be illustrated by the somewhat low return rate (57.9%). That is, it is possible that

caregivers who had not seen PIB in their child did not complete and return the questionnaire. In addition, the results of this sample may not generalize to other populations because the information in the present study was obtained from individuals living in southeastern United States.

The current investigation assessed the occurrence of 5 topographies of PIB. These topographies were selected for evaluation based on their prevalence among individuals with developmental disabilities (as reported by Iwata et al., 1994) and by their inclusion in prior research (e.g., Troster et al., 1991). However, it should be noted that there are many other topographies of PIB that may be displayed by young children (e.g., Kurtz et al., 2003; Richman & Lindauer, 2005). Thus, the current analysis may have limited generality to the overall occurrence of PIB in young children due to the exclusion of some topographies of PIB (e.g., self scratching). Future research might conduct a more comprehensive evaluation of PIB by including descriptions of additional topographies or collecting open-ended data on the forms of PIB that are displayed by children of typical development.

A final limitation concerns the information obtained on the potential operant sources of reinforcement for the topographies of PIB. Specifically, no experimental analysis (e.g., Iwata et al., 1982/1994) was conducted to determine the relevant environmental variables that maintain this behavior, and the questions may have been open to subjective interpretation. Previous research has shown that care provider's report of behavioral function is often unreliable (Zarcone, Rodgers, Iwata, Rourke, & Dorsey, 1991), and no inter-rater agreement was obtained for this survey.

Based on these limitations, the outcomes of the questionnaire developed for this review should be interpreted as representative of the plausibility of the occurrence of PIB in typically developing children rather than representative of the actual prevalence of this behavior. That is, the information derived from this non-experimental questionnaire should be interpreted as informal and descriptive and should be used as the basis for further investigation into the occurrence of this behavior.

Several areas of future research may arise from the current results. First, future research could compare the questionnaire information provided by two caregivers to determine inter-rater agreement on the occurrence of their child's behavior. That is, caregivers may view the severity or frequency of a behavior differently. It is also possible that behavior may be exhibited in the presence of some individuals, but not in the presence of others. Future studies could also examine the developmental progression of this behavior in typically developing children. For example, data collected longitudinally on the behavior of a child from birth to age five may yield information regarding the onset of this behavior and its relative occurrence as the child ages. Such data may also indicate when this behavior emerges (e.g., during ear infections or teething) and when it cease (e.g., when language acquisition occurs; when a child begins school).

Future research might substantiate the results obtained from questionnaires with direct observations of the target behavior (cf., Kurtz et al., 2003; Richman & Lindauer, 2005). Direct observations may yield more precise information on the factors associated with the occurrence of the behavior and may reveal more accurate prevalence estimates (e.g., Bartak & Rutter, 1976). However, it is likely that future work on the occurrence of PIB will continue to rely on parental report due to the relative infrequency of such behavior in typically developing children.

Finally, typically developing children usually acquire socially appropriate replacement skills for PIB (e.g., communication skills), whereas individuals with developmental disabilities may not acquire such skills which might lead to the eventual development of SIB (Kennedy, 2002). Thus, further evaluation of PIB among typically developing children may lead to information on how clinically significant SIB is developed and maintained in individuals with developmental disabilities. That is, identifying the period of time in which PIB is replaced by appropriate behavior in typically developing

children might indicate critical intervention points for individuals with developmental disabilities, which may permit early intervention of SIB.

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Author Contact Information:

Henry S. Roane
Munroe-Meyer Institute, UNMC
985450 Nebraska Medical Center
Omaha, NE 68198-5450

Telephone: (402) 559-2410
Email: hroane@unmc.edu

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Requests for reprints may be sent to Henry Roane at the Center for Autism Spectrum Disorders, Munroe-Meyer Institute/UNMC, 985450 Nebraska Medical Center, Omaha NE 68198-5450 (email: hroane@unmc.edu). Joel Ringdahl is now at the Center for Disabilities and Development, University of Iowa Hospitals and Clinics, 100 Hawkins Dr. – Rm. 353, Iowa City IA 52242. Timothy Vollmer is now affiliated with the Psychology Department at the University of Florida, Gainesville FL 32611. Ernest Whitmarsh is now at the Technical Assistance for Severe Behavior Program, Cobb County School System, 514 Glover St., Marietta GA 30064. Bethany Marcus is now affiliated with Children First, 633 Rosaer Lane, Virginia Beach VA 23464.

Appendix, Next page.

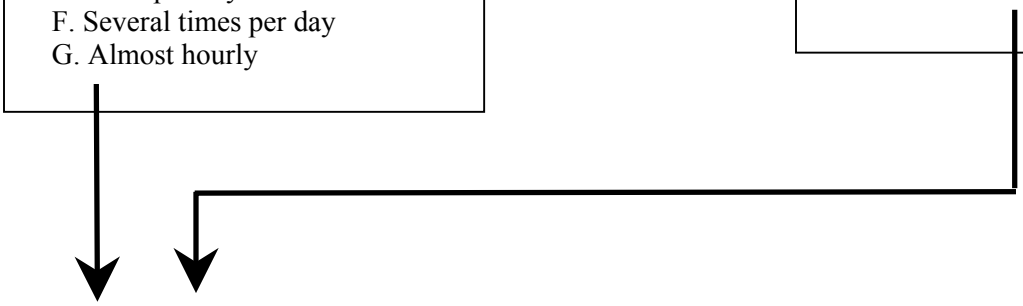
Appendix

Sample page from the questionnaire

TARGET BEHAVIOR #1: HEAD BANGING = Loud, forceful contact of the child's head against wall, floor, bed, crib, or other object.

Frequency of Head Banging
A. Never
B. Rarely
C. Once per week
D. Several times per day
E. Once per day
F. Several times per day
G. Almost hourly

Length of Head Banging
A. Not Applicable (Never)
B. Less than 1 minute
C. 1 – 10 minutes
D. More than 10 minutes



I observed Head Banging:

_____ _____ 1. When the child wanted attention, a favorite toy, activity, person, or food (e.g., child banged head in order to get a stuffed bear, attention, or candy).

_____ _____ 2. When the child wanted to avoid or escape a specific task or activity (e.g., child banged head in order to avoid cleaning their room, brushing teeth).

_____ _____ 3. When the child was engaged in "self-stimulation" (e.g., head banging is something he/she likes to do even when he/she is alone, with no adult present; head banging occurs when the child is placed in his/her bed/crib during naptime or bedtime).

_____ _____ 4. When the child wanted to make him/herself feel better when he/she was uncomfortable or ill (e.g., child ma bang head to alleviate an earache).