

THE ORIGIN OF SELF-INJURIOUS BEHAVIOUR OF CHILDREN WITH MENTAL RETARDATION

M. J. Schneider, A. M. Bijam-Schulte, C. G. C. Janssen and J. Stolk

Introduction

A serious problem in the care for people with mental retardation is the treatment of self-injurious behaviour (SIB). Self-injury is defined as repeated, self-inflicted, non-accidental injury, producing bruising, bleeding or other temporary or permanent tissue damage. Also, we speak of SIB for all behaviour that would have led to injury, if no protective means, restrictive measures, and/or specific interventions had been used. This injury is immediately visible or one may expect injury to develop in time. (cf. Oliver, *et al.*, 1987; Bernard and Haveman, 1993).

Self-injurious behaviour, especially if it continues over a longer period of time, has proven to be extremely persistent and difficult to treat (Altmeyer *et al.*, 1987; Dura *et al.*, 1988; Mulick and

Kedesdy, 1988, Foxx, 1990; Hile and Vatterott, 1991). The reason for this resistance to treatment can perhaps be found in the multiple explanations of SIB:

- * SIB can be organically determined (a raised pain threshold; a disturbance in the opiates-system; addiction to body's own opiates released by SIB (Baumeister and Rollings, 1976; Dosen, 1993).
- * SIB can be explained by a disturbed homeostasis in the processing of stimuli. SIB compensates for understimulation and attenuates overstimulation (Gardner and Sovner, 1994).
- * SIB is transitory behaviour which is considered normal in a certain developmental phase. The severely mentally handicapped lag behind in his development, so SIB is not replaced

Drs. M. J. Schneider

Free University, Faculty of Psychology and Pedagogical Science, Amsterdam.

Drs. A. M. Bijman-Schulte

Free University, Faculty of Psychology and Pedagogical Science, Amsterdam.

***C. G. C. Janssen, Ph.D.**

Free University, Faculty of Psychology and Pedagogical Science, Department of Special Pedagogy, Van der Boechorststraat 1, 1081 BT Amsterdam, The Netherlands.

Tel: + 31 20 4448894 Fax: + 31 20 4448745 E-mail: cgc.janssen@psy.vu.nl

J. Stolk, Ph.D.

Free University, Faculty of Psychology and Pedagogical Science, Amsterdam.

* For Correspondence

by the adequate behaviour of a following developmental phase (Baumeister and Rollings, 1976).

- * SIB can be explained by problems in ego-development. Experiencing self-inflicted pain can be a factor in learning to define the boundaries of the ego (Baumeister and Rollings, 1976).
- * SIB is learned behaviour. SIB can be a means to avoid an aversive stimulus. Indeed, adults who are confronted with SIB find it extremely difficult to ignore. Also, because SIB is rewarded, for instance with attention, it is reinforced (Duker *et al.*, 1993; Gardner and Sovner, 1994).
- * SIB is a way of communicating and for many severely handicapped the only way (Durand, 1986; Day *et al.*, 1986; Durand and Crimmins, 1988; Bird *et al.*, 1989).
- * SIB is a symptom of a mental disease: depression, psychosis, pervasive developmental disorder (Dosen, 1993; Kraijer, 1994).
- * Finally, multiple explanations are also given for SIB. According to Guess and Carr (1991), stereotype rhythmical behaviour transfers to SIB during various stages. This behaviour is maintained through positive and negative reinforcements. Gardner and Sovner (1994) indicate that SIB is a complex phenomenon, which is the end result of a whole range of biomedical and psychosocial influences.

The many explanations for SIB indicate that SIB can serve many functions. The tenacity of SIB is partially explained by the fact that in the course of time this behaviour takes on more and more functions for the mentally handicapped.

Iwasaki and Millenaar (1992) in a cross-cultural study between Japan and the Netherlands found that SIB starts at an early age and they stated that early intervention by "all significant others" is possibly more successful because the SIB will initially not have as many functions/significance for the mentally handicapped. Therefore, it would be less resistant to treatment in this first phase.

The objective of our research is to gain insight into the factors that are relevant to the origin of SIB. The research questions are: How does SIB originate (precursors; the age at first signs of SIB; the reactions and the immediate effects etc.)? What explanations do parents have for the incipient SIB? What differences can be found in the initial period of that behaviour between children who do and children who don't display SIB? To what extent do their families differ?

Method

Interviews were carried out with parents of children who live in group homes providing 24-hour care, display SIB, are not older than 25 to 30 years of age and were admitted for as short a time as possible and, in any case, for no longer than 15 years. These limits in age and duration of admittance are introduced to increase the chance that the parents will still remember the onset of SIB as much as possible. A control group was composed. This group was matched for sex, age, level of functioning and age when placed in care. Moreover, the control group was not supposed to display SIB.

Twenty seven institutions were approached. The final research group

consists of 59 parents/parental couples. Because no response was received from 42% of the potential parents, it is unclear to what extent this self-selection has affected the representativeness of the research group. Considering the emotional charge of the subject, a reminder was not sent out. Therefore, some caution is called for concerning the representativeness of the research group.

The control group consisted of 13 people. It was extremely difficult to complete the control group for the following reasons: the children had to be comparatively young, two thirds of the research group was younger than 20 years of age; the children had to have been placed in care at a relatively young age, two thirds of them at younger than 10 years of age; the children had to have a comparably low level of functioning. Frequently it was because of the combination of these factors that no match could be found. An additional complicating factor was that no SIB was supposed to have occurred in the past. The matched control children, however, very often did show SIB in the past. Consequently, this last crite-

ri-
on was performed relaxed to: no SIB at the time of the interview. With regard to the matching variables: age, sex, age when placed in care and level of mental handicap, we found no significant differences between the research group and the control group. Therefore, in this sense the matching has been successful. Both groups involve mostly seriously and severely mentally handicapped children who were all placed in care before they turned twenty. The average age in both the research group and the control group at the time of the research is 18 or 19 years of age (TABLE I).

A retrospective interview with the parents was used: the origin of the SIB and the period directly before is looked back upon with the parents. All results are based on the information given by the parents. The interviews with parents of the control group concern the period just before the child was placed in care. The questions in the interview are based on literature and on the results of a previous study of files of children with self-injurious behaviour (Bijman-Schulte *et al.*, 1994).

TABLE I
Composition of the Research and the Control Group According to Age and Sex.

Age	Research Group			Control Group		
	Male	Female	Total	Male	Female	Total
6 - 10 years	1	0	1 (2%)	1	0	1 (8%)
11-15 years	11	5	16 (27%)	2	2	4 (31%)
16 - 20 years	10	9	19 (32%)	3	2	5 (38%)
21 - 25 years	9	4	13 (22%)	1	1	2 (15%)
26 - 30 years	6	4	10 (17%)	0	1	1 (8%)
Total	37	22	59 (100%)	7	6	13 (100%)

Results

The history of SIB

The parents were asked if, on looking back, they could speak of a "precursor", i.e. if they, in some way or another, had seen any signs of the SIB beforehand. Only 18 parents (31%) indicated that there had been a precursor to the SIB, or that the SIB had replaced other behaviour that the child had displayed in comparable situations (TABLE II).

Guess and Carr (1991) argue that rhythmical and stereotypical behaviour can function as a precursor to SIB. In the cases mentioned, the categories sucking/rubbing and fluttering can be looked upon as rhythmical stereotypical behaviour. In the case of three of the four children, who had slight SIB as a precursor, the following behaviour can also be considered stereotypical: pounding softly, pushing one's fingers against one's teeth. That means that with regard to precursors, in half the cases this can

be considered a form of stereotypical behaviour.

Eleven of the 18 parents who could name a precursor barely viewed that precursor as a problem; it was looked at as behaviour appropriate for young children. Moreover, in none of the cases did anybody ask for advice concerning the way to deal with the precursor and they seldom spoke to others about it. If a precursor was present, almost all parents spoke of a gradual transition to SIB. According to the parents, 69% of the children started the SIB at home and 31% of the children in the group home.

The various forms of incipient SIB are often pounding, biting or hitting (TABLE III). The children often displayed more than one form of SIB in the incipient period: 56% displayed two or more forms.

In the literature it is stated that SIB often originates at a young age (Iwasaki and Millenaar, 1992). The results of this research support this: in 68% SIB originates before the sixth year (TABLE IV).

TABLE II
Forms of Precursors
(n = 18)

Sucking/rubbing	Fluttering	Slightly self-injurious	Crying fits	Shouting	Otherwise
5	1	4	3	1	4

TABLE III
First Forms of SIB
(n = 59; more than 1 form can be given)

Pounding	Biting	Hitting	Scratching	Chafing	Otherwise
31 (52%)	31 (52%)	24 (41%)	9 (15%)	3 (5%)	18 (30%)

In most cases, according to the parents, the onset of SIB was not tied to one particular place (64%) or to the presence of certain people (56%). Asked about possible immediate motives for the first forms of SIB, parents sometimes mention more than one motive (TABLE V). Emotional discomfort, e.g. "if he didn't feel comfortable with himself", is mentioned most often by the parents (37%) as an immediate motive for the first forms of SIB. 20% of the parents have no idea about the motive.

The degree of damage which is caused by the first SIB is limited: in 66% of the cases there is only light temporary damage. The frequency of the behaviour, however, is high from the beginning: for only 27% of the children it is less than once a day, for 58% of the children once

or more than once a day and for 15% even virtually continuous.

A mere 12% of the parents stated that the SIB was a reason for placing the child in care. Nevertheless, in the period just before placing in care, nearly 70% of the children displayed severe SIB. Parents were asked how they themselves and how group leaders (if the child had been in a group home/day centre) reacted to the first SIB (TABLE VI). Most of the parents (64%) were found to caution and to hold their children during those first forms of SIB. Parents and group leaders also often tried to distract the child or to comfort it. The effect of these reactions has obviously not been found to be lastingly positive: all of the children, after all, continue to display SIB.

TABLE IV
Age at the Onset of SIB
(n = 59)

0-5 years	6-10 years	11-15 years	16-20 years	older than 20
40 (68%)	9 (15%)	6 (10%)	3 (5%)	1 (2%)

TABLE V
Immediate Motives for First SIB
(n = 59; more than 1 motive can be given)

Work one's will	Physical discomfort	Emotional discomfort	Boredom	Commotion	No idea
9 (15%)	8 (14%)	22 (37%)	4 (7%)	9 (15%)	12 (20%)

TABLE VI
Reactions to First SIB

	Comforting	Distracting	Cautioning/ holding	Ignoring	Punishing	rm
Parents (n = 59)	16 (27%)	21 (36%)	38 (64%)	3 (6%)	8 (14%)	7 (12%)
Group Leaders (n = 26)	3 (12%)	10 (39%)	8 (31%)	1 (4%)	2 (8%)	3 (12%)

rm = light restraining measures

53% of the parents asked for advice about the incipient SIB. Only 24% were actually given some advice. A complaint often heard was: "they didn't know what to do about it either."

Explanations for SIB

When asked for a personal explanation for the origin of the SIB, 68% of the parents had an explanation. Often mentioned are: feelings of dissatisfaction, frustration, anger. Parents who do not have an explanation occasionally say: "that's just the way he is".

From the research literature 13 propositions concerning possible causes

of SIB were deduced and presented to the parents asking them to state whether they agreed with the propositions or not (TABLE VII first column). According to the parents, in the initial period SIB has especially to do with: "coming from somewhere within" (85%), "difficulties in coping with impressions from outside" (69%), and "feeling and wanting more than he could express" (61%). SIB has relatively little to do with "wanting to shirk doing tedious chores or tasks" (7%).

A factor analysis done with these 13 explanations produced 4 factors (explained variance: 54%: TABLE VII columns 2 through 5). Four factor scores were calculated by summing those

TABLE VII
Explanations for SIB in the Incipient Period and Factormatrix After Oblique Rotation
(n = 59)

	Yes	F1	F2	F3	F4
a He had trouble coping with all of the things that approached him from the outside	41 (69%)	.13	.59	.21	-.07
b Too high demands were made	18 (31%)	-.33	.61	-.03	-.06
c He felt and wanted much more than he could express	36 (61%)	.17	.52	-.07	.25
d It seemed to be caused by boredom	22 (37%)	.52	-.08	-.59	.04
e It met a need for external stimuli	12 (20%)	.55	-.04	-.02	.18
f In some way it came from within	50 (85%)	-.02	-.11	.68	-.11
g He thus tried to have his way	27 (46%)	.65	.41	.13	-.25
h It was the only way to let us know that something was bothering him	31 (53%)	.24	.71	-.33	-.06
i It seemed as if he did it to drown out other pain or itching	15 (25%)	.27	-.05	-.34	.66
j He did it to shirk doing tedious chores or tasks	4 (7%)	.22	.02	-.17	-.71
k He did it reluctantly	21 (36%)	.14	.33	.55	.41
l It seemed to be a kind of addiction	22 (37%)	.29	-.33	.42	.12
m He did it to get attention	25 (42%)	.80	.17	-.03	-.12

explanations with factor loadings $>0,45$. These 4 factors are named as follows: 1) SIB as a call for *attention*; 2) SIB as an expression of *dissatisfaction*; 3) SIB as an *autonomous fact* ("doing it reluctantly; coming from within") and 4) SIB as the drowning out of other *physical discomfort*.

At the end of the interview the parents were asked if they might interpret the SIB of their child as a request for help (TABLE VIII). In a number of cases more than one request for help was mentioned.

Comparison of their child's request for help, as formulated by the parents, with the 4 factors of the factor analysis yields approximately the same description.

The parents were asked if they, on looking back, think that the SIB could have been prevented. 76% answered in the negative. The 24% who thought that it could have been prevented, look for the preventative measures especially for a different approach at the very first occasions that the behaviour arose: "a kind of preventive help, don't reason it away, offer distraction, give as many means of expression as possible". Furthermore, the parents note that there should be a

lot of support, understanding and openness for the parents and that the situation should be looked at thoroughly, a situation analysis should be made. This links up with the fact that parents offer many different explanations for the origin of SIB.

Differences between research group and control group

Parents in the research group were asked if there were other forms of problem behaviour in the period of the origin of the SIB. The same questions were put to the parents in the control group for the period just before the child was placed in care (TABLE IX). It is remarkable that in both groups problem behaviour other than SIB often occurred in the early period. Children who injured themselves, however, had significantly more often trouble adapting to others. Moreover, they suffered significantly more frequently from sleeping disturbances, hyperactive behaviour and depressions than the children in the control group.

TABLE VIII
Requests for Help as Formulated by the Parents
(n = 54)

It cannot be seen as a request for help	14 (25%)
The problem is not knowing what he is asking	13 (24%)
It is a request for attention and sympathy	14 (25%)
It is a way to express his dissatisfaction	6 (12%)
It is an utterance of powerlessness or anger	5 (10%)
It is an expression of pain	4 (8%)

TABLE IX
Other Problem Behaviour in the Incipient Period of SIB

Forms of Problem Behaviour	Research Group (n = 59)	Control Group (n = 13)
Doesn't seek contact with others	33 (56%)	5 (38%)
Aggressive towards others	18 (30%)	2 (15%)
Has trouble adapting*	30 (51%)	5 (38%)
Wants to do as he/she wishes	38 (64%)	10 (77%)
Doesn't initiate contact	37 (63%)	10 (77%)
Doesn't join in with others	42 (71%)	9 (69%)
Is heedless of wishes of others	25 (42%)	0 (0%)
Is destructive (material)	17 (29%)	3 (23%)
Pica	4 (7%)	0 (0%)
Eating problems	24 (41%)	4 (31%)
Sleeping problems*	30 (51%)	4 (31%)
Is hyperactive**	22 (37%)	0 (0%)
Displays autistic behaviour	29 (49%)	4 (31%)
Is depressed*	11 (18%)	0 (0%)
Stereotypical behaviour with regard to own body	38 (65%)	8 (62%)
Stereotypical behaviour with regard to material	43 (73%)	7 (54%)

(Mann-Whitney U: * p<.05; **p<.01)

Inquiries into the occurrence of motor and sensory handicaps, epilepsy and metabolic disorders in the early period were made. There appeared to be no significant differences between the research group and the control group. One salient fact was, that on the whole, in the research group as well as in the control group, more additional handicaps exist than might be expected based on previous research of the total population of people with a mental handicap in the Netherlands. This is probably because this research was mainly about young

residents at a lower level who had already been placed in residential care at a young age. The nature of the diagnosis in both groups is quite similar (TABLE X).

With regard to special circumstances in the development, such as slow development, difficulties in making contact, autistic behaviour and with regard to life events, such as illnesses, hospitalisation and other breaking points in the development, there also appeared to be no significant differences between the research and the control group.

In earlier case-studies (Bijman-Schulte *et al.*, 1994) the following variables were found to be characteristic for children with SIB: oversensitivity to sensory impressions, a disorder in the sensitivity to pain and a disturbance in the sleep-wake rhythm. Therefore, these characteristics were explicitly asked about (TABLE XI). Contrary to expectations, a disorder in the sensitivity to pain did not occur more often in the incipient period in the research group. These results suggest that this disturbance occurs generally among many mentally handicapped of a lower level. Oversensitivity to sensory impressions and a disturbance in the sleep-wake rhythm did, according to the parents, appear

significantly more often in the research group than in the control group.

When also asked about their child's temperament as a baby 29% of the parents of the research group answered that their child had been a somewhat difficult baby, as opposed to 15% of the control group. In both groups approximately one third of the parents thought their child had been unusually easy as a baby. When asked about the temperament of the child at toddler/pre-school age, 76% of the research group thought their child had been difficult as opposed to 31% of the control group (Mann-Whitney U, $p=.01$).

Parents were asked about the skills of the children in the early period (TABLE

TABLE X
Diagnoses in the Research and the Control Group

Diagnosis	Research Group (n = 59)	Control Group (n = 13)
Unknown	18 (31%)	4 (31%)
Down's syndrome	2 (3%)	1 (7%)
Genetic defect	3 (5%)	0 (0%)
Brain damage	20 (34%)	4 (31%)
Other	16 (27%)	4 (31%)

TABLE XI
Special Circumstances/Events in the Development

Special Circumstances in Development	Research Group (n = 59)	Control Group (n = 13)
Hypersensitivity to sensory impressions*	34 (58%)	2 (15%)
Disorder in the sensitivity to pain	39 (66%)	10 (77%)
Disorder in the sleep-walk rhythm**	37 (63%)	3 (23%)

(Mann-Whitney U, * $p<.05$; ** $p<.01$)

TABLE XII
Limitations in Skills in the Research Group and the Control Group

Skills	Research Group (n = 59)	Control Group (n = 13)
	Limited Skills	Limited Skills
Getting depressed	47 (80%)	10 (77%)
Eating independently	27 (46%)	7 (54%)
Talking*	46 (78%)	7 (54%)
Passive language*	22 (37%)	0 (0%)
Expressing wishes**	22 (37%)	0 (0%)
Expressing feelings	31 (53%)	4 (31%)

(Mann-Whitney U, * p<.05; **p<.01)

XII). With regard to dressing themselves and eating independently, it was found that many children in the research group (80% and 46%), as well as in the control group (77% and 54%), had not yet mastered those two skills. In view of the fact that the children were (very) young at that moment and of relatively low level, this is not all that surprising. Consequently, these differences between the research and the control group are not significant. Significant differences were found in communication-skills: 78% of the research group could not talk, versus 54% of the control group. Significantly more children of the research group do not understand language and can not express their wishes.

Significantly more children of the research group (32%) than of the control group (8%) felt, according to the parents, no bond with or attachment to others in the early period (Mann-Whitney U, $p = .05$). Significantly more children of the research group also knew many situations in that initial period that were

threatening to them (73% versus 31%: Chi-square, $p = .00$) such as fear of change, of loss of self-control, of commotion or of strangers.

During the interview, the Questionnaire of Parental Educational Skills (Janssen, 1992; van Gennep *et al.*, 1995) was administered. This questionnaire consists of 31 statements on how parents experience educating their child, with five-point scales. Significant differences were found: parents of children that display SIB did not understand their child's behaviour as well, knew less well what they could ask of their child and found the upbringing more strenuous (Mann-Whitney U, $p = .01, .01$ and $.01$).

For the remaining family and environment characteristics - family composition, attitude of the family members towards the child, social contacts and how the day is spent - no significant differences were found.

Conclusions and Discussion

Before considering the relevance of the study results any further, some technical research annotations are indicated. The representativeness of the research group is not entirely evident because about 42% of the parents did not respond. However, we have no reason to assume - also after consultation with the professionals of the group homes - that this non-response has led to distorted results. On the contrary, the description is consistent and in keeping with the existing theories concerning SIB.

In addition, the control group is small. This means that the results that are based on a comparison between the research group and the control group, require still further research. After all, partly due to the small research groups, no use could be made of multivariate analyses. Because of the use of many univariate statistical analyses, it is not likely that chance is excluded sufficiently. The small size of the control group is due to the great difficulty to find low level children who never showed SIB. Most of the potential control children did in fact show SIB in the past. There is probably a large group where SIB extinguishes. Further research, especially with this last group, seems to be interesting and could reveal the relevant factors in disappearing SIB.

SIB starts early in life. 68% of the children were shown to have developed the SIB before their sixth year. Almost 75% of the parents think that problems in communication is an important motive for SIB and many parents mention their children's psychological discomfort and reluctance.

In only 31% of the children could one speak of precursors to SIB and when there were precursors, these were frequently "normal" types of behaviour for young children, such as sucking their fingers, etc. Therefore, no high-risk group can be distinguished merely on the grounds of precursors to SIB. This absence of clear precursors seems to be a main reason why parents are not optimistic about prevention of SIB.

With the various characteristics that proved to be significant, possible risk factors have been listed for the development of SIB. In this research especially child characteristics account apparently for the differences between the research and the control group and hardly any characteristics of the family or environment. This means that if a child displays SIB this probably says more about the child than about his parents or environment. This is consistent with the results of a previous study of files of children with self-injurious behaviour. These files were written by caretakers (Bijman-Schulte *et al.*, 1994). The following characteristics/risk factors are involved:

- * Characteristics related to *problems in temperament*: hypersensitivity to sensory impressions; sleep disturbances or disturbances in the sleep-wake rhythm; hyperactive behaviour;
- * Characteristics related in *interaction/communication*: limited active and passive language; limited skills in expressing one's wishes and feelings; related to this: limited understanding by the parents, who as a consequence do not know which demands they can put on their child; troubles in adapting to others; limited feelings of attachment to others;

- * feelings of fear and threat and finally,
- * depressive feelings.

A combination of various of these characteristics possibly entails a greater risk of developing SIB. On the basis of these results, research can be done into the effectiveness of secondary prevention: based on an extensive situation-analysis of children that display incipient SIB, a brief intervention could be devised. In this situation-analysis a systematic analysis of the different explanations of the behaviour seems to be very important. Early intervention may very well prevent the SIB from acquiring multiple functions and consequently from developing into a serious problem.

Summary

By means of retrospective interviews with parents of children with a mental handicap who show self-injurious behaviour (SIB) it was examined how their child's SIB originated, which explanations they have to offer and to what extent their children differ from a control group. It was found that 68% of the children who injured themselves had already started this behaviour before their sixth year and that as a rule hardly any clear precursors to this behaviour can be indicated. For the parents the SIB is seen as a way of asking for attention, as a means of expressing dissatisfaction, as an autonomous fact - doing it "reluctantly" - or as behaviour that serves to drown out other physical discomfort. Children who display SIB distinguish themselves in that initial period especially by their problematic temperamental disposition, by their problematic

interaction with others and by their fearful, often gloomy interpretation of their social environment.

Acknowledgements

This research was initiated by a study group established by the Chief Medical Office for Mental Health of the Dutch Government and was made possible by a grant from the Prevention Fund.

References

- Altmeyer, B. K., Locke, B. J., Griffin, J. C., Ricketts, R. W., Williams, D. E., Mason, M. and Stark, M. T. (1987). Treatment Strategies for Self-Injurious Behaviour in a Large Service-Delivery Network. *American Journal of Mental Deficiency*, 91, 333-340.
- Baumeister, A. A. and Rollings, J. P. (1976). Self-Injurious Behaviour. In: N.R. Ellis (Ed.). *International Review of Research in Mental Retardation*. Volume 8. New York: Academic Press Inc.
- Bernard, S. and Haveman, M. J. (1993). *Zelfverwondend gedrag bij verstandelijk gehandicapten, Verslag van het Delphi-onderzoek (Self-injurious behaviour by the mentally handicapped, Report of the Delphi-research)*. Maastricht: Rijksuniversiteit Limburg.
- Bijman-Schulte, A. M., Schneider, M. J. and Janssen C. G. G., (1994). *Onderzoek naar het ontstaan van zelfverwondend gedrag bij verstandelijk gehandicapten. De eerste fase: het dossieronderzoek (Self-injurious behaviour: first phase, study of files)*. Amsterdam: Vrije Universiteit.
- Bird, F., Dore, P. A., Moniz, D. and Robinson, J. (1989). Reducing severe aggressive and self-injurious behaviours with functional communication training. *American Journal of Mental Retardation*, 94, 37-48.
- Day, R. M., Johnson, W. L. and Schussler N. G. (1986). Determining the communicative properties of self-injury: research, assessment and treatment implications. *Advances in Learning and Behavioral Disabilities*, 5, 117-139.

- Došen, A. (1993). Self injury behaviour in the mentally retarded, a developmental psychiatric approach, In: Fletcher, R. and Došen, A. *Mental Health aspects of Mental Retardation, Progress in assessment and treatment*. New York: Lexington Books.
- Duker, P., Didden, R. and Seys, D. (1993). *Probleemgedrag bij zwakzinnigen: analyse en behandeling (Problem behaviour of the mentally handicapped: analysis and treatment)*. Utrecht: SDU.
- Dura, J. R., Mulick, J. A. and Hammer, D. (1988). Rapid Clinical Evaluation of Sensory Integrative Therapy for Self-Injurious Behaviour. *Mental Retardation*, 26, 83-87.
- Durand, V. M. (1986). Self-injurious behaviour as intentional communication. *Advances in Learning and Behavioral Disabilities*, 5, 141-155.
- Durand, V. M. and Crimmins, D. B. (1988). Identifying the variables maintaining self-injuries behaviour. *Journal of Autism and Developmental Disorders*, 18, 99-117.
- Foxx, R. M. (1990). "Harry": A Ten Year Follow-up of the Successful Treatment of a Self-Injurious Man. *Research in Developmental Disabilities*, 11, 67-76.
- Gardner, W. I. and Sovner, R. (1994). *Self-Injurious Behaviours, Diagnosis and Treatment*. Pennsylvania: VIDA Publishing.
- Gennep, A. T. G. van, Procee A. I., Meulen B. F. van der, Janssen C. G. C., Vermeer A. en Graaf E. A. B. de, (1995). *Evaluatie van vroeghulp in Nederland (Evaluation of early intervention in the Netherlands)*. Amsterdam: VU-uitgeverij.
- Guess, D. and Carr, E. (1991). Emergence and maintenance of stereotypy and self-injury. *American Journal of Mental Retardation*, 96, 299-319.
- Hile, M. G. and Vatterott, M. K. (1991). Two Decades of Treatment for Self-Injurious Biting in Individuals with Mental Retardation or Developmental Disabilities: A Treatment Focused Review of the Literature. *Journal of Developmental and Physical Disabilities*, 3, 81-113.
- Iwasaki, M. and Millenaar, A. A. J. (1992). A cross-cultural study between the Netherlands and Japan on self-injurious behaviour (SIB). Comparing the prevalence: Theoretical ways of approach and treatment methods. *Developmental Human Research*, 4, 54-67.
- Janssen, C. G. C. (1992). *Vragenlijst Opvoedend Handelen (Questionnaire of Educational Conduct)*. Amsterdam: Vrije Universiteit.
- Kraijer, D. W. (1994). *Zwakzinnigheid, autisme en aan autisme verwante stoornissen. Classificatie, diagnostiek, prevalentie, specifieke problematiek, opvoeding en behandeling (Mental deficiency, autism and disorders related to autism. Classification, diagnostics, prevalence, specific problems, education and treatment)*. Lisse: Swets and Zeitlinger.
- Mulick, J. A. and Kedesdy, J. H. (1988). Self-Injurious Behaviour, Its Treatment and Normalization. *Mental Retardation*, 26, 223-229.
- Oliver, C., Murphy, G. H., Corbett, J. A. (1987). Self-Injurious behavior in people with mental handicap: a total population study. *Journal of Mental Deficiency Research*, 31, 147-162.