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Sub-categorizing hyperactivity: a replication and extension of the stony brook scale

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Additionally the correlation between the Teachers Hyperactivity factor and the Parents Hyperactivity factor was = 0,22. This correlation was significant at the 0,05 level. These correlations, despite the issue of statistical significance, are both of a very similar nature. They both indicate some relationship between the two factors, but themselves only explain a very small proportion of the variance represented in these factors. This accords with the earlier suggestions prevalent in the present study regarding the environment specificity of hyperactive behaviour.

The first suggestions of situational-specificity by Langhorne et al (1976) was further supported by Loney et al (1978). Basing their conceptions on the work of Mischel (1968) these authors expressed the view that hyperactivity may be a situation specific behaviour. This was the theoretical basis for assuming a single source design in the specific exploration of hyperactivity. The results of this study support this viewpoint. As has been shown the SBS displays similar abilities and characteristics across two different sources, parents and teacher ratings. Clearly, however, the inter-source correlations of identical factors suggests a relationship between the factors which are moderate at best. This would indicate that while the factors are evaluating similar dimensions consistently, they remain relatively independent, even when utilized amongst the identical sample of children. It is suggested cautiously that these children may indeed be displaying

different types of behaviour in the home and in the school environments. As such they are likely to be perceived differently by parents and teachers respectively. If this is the case, then evidence from this study (which utilized two separate single-source analyses) may indeed add confirmation to the situation - specificity hypothesis of Langhorne et al (1976) and Loney et al (1978).

Validity

While the ability of the SBS to delineate certain dimensions of childhood behaviour reflects some consistency and validity, a more independent empirical investigation of validity is required.

To this end, factor scores were computed and correlated for the SBS and also for the TRS and BPC as separate measures. In this way it was hoped that some indexes of concurrent and discriminative validity could be provided, for factors emerging from both teacher and parent SBS ratings.

Examination of the correlation matrix, reveals some interesting features. Significant correlations appeared (p 0,01) between SBS Aggression and Hyperactivity factors for both parent ($r = 0,51$) and teacher ($r = 0,32$) ratings of hyperactive children. Thus, while two orthogonal factors of Hyperactivity and

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Aggression did emerge, there nonetheless exists an area of overlap or shared variance between them. This is in contrast to the findings of O'Leary and Steen (1982) who report insignificant correlations between these factors in both their selected hyperactive samples, (r = 0,07 and 0,21).

Nonetheless the current study is able to report satisfactory evidence of concurrent validity, for both of these SBS factors. The SBS Aggression factor correlated significantly (p 0,01) with the BPC conduct disorder factor yielding correlations r = 0,89 and r = 0,91 for teacher and parent ratings respectively. Additionally this factor correlated significantly with the TRS conduct disorder factor yielding a correlation coefficient r = 0,96 for both parent and teacher data. Likewise the SBS Hyperactivity factor displays a good correlation (significant at the 0,01 level) with the TRS hyperactivity factor (r = 0,76 and r = 0 73) for teacher and parent ratings respectively.

Measures of discriminative validity are not so encouraging, and reflect a similar pattern as the correlation between the factors themselves. The SBS Hyperactivity factor achieved moderate but significant correlations with the BPC conduct disorder factor (r = 0,56 and r = 0,59 for teacher and parent data respectively), as well as with the TRS conduct disorder factor (r = 0,25 and 0,50). Similarly, the SBS Aggression factor

attained a significant correlation for both data groups with the TRS hyperactivity factor ($r = 0,61$; p 0,01). These data seem disappointing, in the light of the satisfactory measures of discriminative validity of SBS factors reported by O'Leary and Steen (1982).

The reasons for these differences between the present study and the original SBS research (O'Leary & Steen, 1982) are not clear. The consistency of the SBS in producing separate factors of Aggression and Hyperactivity over a variety of situations has been reported in this and other studies (O'Leary & Steen, 1982). The overlap between correlated factor scores of these two factors, thus seem inconsistent with the overall stability of the SBS. As such the present researcher was prompted to examine the research methodology of the current research and possible differences between this methodology and that of O'Leary and Steen's (1982) original study.

One such anomaly was apparent, and played a major role in the sampling procedures of the present study. O'Leary and Steen (1982) extracted their sample from a clinically referred population, who were thought likely to warrant placement in a Laboratory School due to the severity of their problems. Further to this, these children all scored 2 or above on the abbreviated TRS. The selection criterion for the present study were less stringent. Firstly the sample was selected

from a school-going population and was not clinically referred. Children selected for placement in the hyperactivity sample of the present study were all functioning in normal school environments suggesting a lesser impact of their hyperactivity. The selection criterion for admission to the "selected" hyperactive sample in the present study, was an abbreviated TRS score of 1,5. Despite the statistical acceptability of this criterion (Werry et al, 1975) it is well below the criterion set by O'Leary and Steen (1982).

The two samples thus seem different on two counts. Firstly the severity of their problems seem qualitatively different, with the sample in the present study seeming less disturbed than that of the original study. Secondly these differences were operationally entrenched in that the present study assumed a lower abbreviated TRS arbitrary point than did O'Leary and Steen (1982). Consequently it may be concluded that the sample of hyperactive children in the present study may be of a less homogeneous nature than the samples in O'Leary and Steen's (1982) research. It is specifically suggested that the range of scores in the present study was broadened due to the above outlined sampling methods. As a result of this the factor score correlations between dimensions of aggression and hyperactivity may have increased in comparison to similar correlations in the original study. Additional support for this extended range of scores' hypothesis is drawn from the observations of increases in other correlational data between the two scales, for example data illustrating concurrent validity.

Such an interpretation of these results highlights the sensitivity of both the Stony Brook Scale and the factor analytic methodology (Kim & Muller, 1978; Gilbert, 1977) to homogeneity of the sample concerned. Moreover such an explanation suggests that the greater amount of shared variance between correlated factor scores of the SBS Hyperactivity and Aggression factors may be attributed to the sampling characteristics of the present study. In this regard it is suggested that the factors themselves are not intrinsically interrelated.

Limitations of the present study

It has been noted that the results of this research support the original SBS research (O'Leary & Steen, 1982), thus confirming the stable nature of the SBS. It however is necessary to elucidate some factors which may be considered limitations to the present study.

Runyon and Haber (1980) amongst others, note the desirability of utilizing random sampling techniques in the selection of research samples. Such random samples offer the possibility of generalizing results beyond the limits of the research context. The present study however did not utilize a random sampling method. Both the original 1 800 children (screened for hyperactivity) and the heterogeneous sample (n = 90) were selected on the basis of accessability and comparability to the

samples of O'Leary & Steen (1982). A more accurate sampling procedure is suggested by Surwillo (1980). This would entail compiling a comprehensive list of hyperactive children across geographical areas, and then randomly selecting a research sample from this group. Unfortunately such a procedure was beyond the scope of the present study. As such it is advised that the results of this research be viewed tentatively, and examined in the perspective of past research on the SBS (O'Leary & Steen, 1982).

Further to this some specific biases in the selection of the present sample are noted. South Africa has a vastly heterogeneous society, demarcated largely by different racial and cultural groups. These different groups of people may not only react differently to forms of psychological assessment, but also may define hyperactive behaviour in different terms. There is some evidence to suggest that the conception and definition of psychiatric disorders differs from culture to culture. (Weinberg, 1968). Recent evidence has also illustrated different responses to United States validated instruments amongst different South African cultural and racial groups (Barling Bresgi & Kendall, 1981). In this context, the results of the present study cannot be assumed to be cross-culturally applicable. This study was in part an attempt to replicate the work of O'Leary & Steen (1982) and for the sake of comparability, utilized only white English-speaking

children attending government schools. It is suggested that the results of this study may not be extrapolated beyond the cultural limits of white, anglo-saxon children.

A further limitation of the present research relates to the differences apparent between the selected hyperactive sample and the heterogeneous control sample. Ideally experimental and control groups should be well matched over numerous specified variables (Gilbert, 1977). This was largely the case with the two samples of the present study. However it is noted that some differences did occur between the hyperactive and heterogeneous samples, with regard to mean (x) age and sex ratios. Although it is doubted that these variables importantly effected the outcome of this research such a possibility must be retained until further empirical evidence is produced.

Suggestions for future research

The SBS itself is an instrument which has been shown to be effective amongst homogeneous samples of hyperactive children (O'Leary & Steen, 1982). Further to this the factor analytic methodology also requires homogeneous data samples for optimal success (Child 1970; Gilbert 1977). In this light, it is suggested that future research examine even more homogeneous sub-groups of hyperactive children. Such increased homogeneity may be effected on at least two dimensions, age and degree of hyperactivity.

Both the current study and the research of O'Leary and Steen (1982) included a fairly wide age-spectrum of hyperactive children. These children ranged in age from the 1st to the 5th school year in both studies. It may prove valuable to examine samples of hyperactive children within a single age group, given the greater homogeneity of such groups, in areas of psychological and physical development.

A further suggestion regarding sample homogeneity, is to investigate large groups of hyperactive children who fall within specific ranges on the abbreviated TRS. In this way homogeneity of samples may be increased with respect to degree of hyperactivity. Differences between inter-factor correlations evidenced in the present study, and those reported by O'Leary & Steen (1982) may have been a function of the different abbreviated TRS cut-off scores utilized in the two studies (1,5 and 2,0 respectively). As such examination of SBS factor analyses performed separately amongst large samples of hyperactive children scoring

a) Between 1,5 and 1,9

b) Between 2,0 and 2,4

c) 2,5 and above

on the abbreviated TRS, may be of great value. Such an investigation was prohibited in the present study as the sample size of children in each abbreviatred TRS category was too small to yield meaningful data.

Additionally standardization studies of the SBS amongst large randomly selected samples will be necessary in introducing the measure to clinical practice. A prototype standardization study has recently been completed on the TRS, (Trites, Blouin & Laprade, 1982). Using a large random sample of 14 000 children these authors present normative data for the TRS and additionally a sound methodological model for future studies in this area. It is noted that this study has appeared some 15 years after Connors' (1967) inception of the TRS. Hopefully normative data on the SBS will not be so long awaited.

It is finally noted that some SBS questions are not appropriate to application with parents. It is suggested that these be modified for parent and teacher usage. What may thus emerge are two slightly different SBS scales for use amongst parents and teachers respectively.

Conclusion

The Stony Brook Scale was developed to subcategorize hyperactive children (O'Leary & Steen, 1982). In doing so it fulfills a practical and theoretical function which has been seen

as crucial for almost a decade (Fish, 1975; Langhorne et al, 1976; Loney et al, 1978; Loney, 1980). This study has produced evidence to confirm the stability of the SBS over various situations.

The SBS produced consistent factor analytic results across time, location and socio-cultural differences, amongst a selected hyperactive sample and a heterogeneous sample of children. More importantly, its ability to delineate separate dimensions of Aggression and Hyperactivity amongst selected samples, was confirmed by the findings of the current research.

The scale displayed the same stability and differentiating ability in its utilization with a different data source. The successul extension of this scale to its use with parent ratings, not only vastly expands the clinical utility of the scale, but also adds to its attributed stability and validity.

Methodological difficulties in the sample procedures of the present study have cast some doubt upon the independence of the scales' major dimensions. Whilst this is considered to be a methodological feature of the present research and not an intrinsic feature of the SBS, it is clear that further definitive research is required in this regard.

The successful replication of much of O'Leary and Steen's (1982) original findings regarding the SBS is important. Possibly for the first time, a demonstrably replicable methodology and instrument exists for sub-categorizing hyperactive children. There are many theoretical implications resulting from this, which have been articulated in the above discussion. The clinical meaning of such a measure clearly remains the most important benefit.

The present study has elucidated the need to operationalize sub-categories of hyperactive children, for diagnostic, prognostic and treatment clarification. The Stony Brook Scale is one step in the correct direction, and in due course may form part of the diagnostic evaluation for child psychologists working in this area. The ability of this scale to differentiate aggressive and purely hyperactive children is an asset long awaited in this field.

However, this remains only one step. The evidence of Fish (1975) Ross and Ross (1976) and Loney (1980), amongst others, suggests that other similar sub-groups exist. These also need to be operationally identified. Further to this the Stony Brook Scale has approached success on the level of identification and diagnosis. The task of formulating and evaluating differential treatment strategies, which account for individual

etiological and diagnostic differences, surely remains a major challenge for research in this area (Loney, 1980). Theoretical and clinical advances in this field, as may have been noted, emerge neither with speed nor ease, despite the apparent hyperactivity of researchers. Perhaps one indication which emerges from this study is the need to 'sub-categorize' research efforts. In this way researchers may empirically tackle specifically defined problems of a smaller nature, in a persistent and methodological manner. Whilst this may not provide answers to global questions, a body of useful and valuable knowledge may be accumulated. In time to come such knowledge may give clarity to theoretical issues and precision to clinical decision making.

APPENDIX 1

Table 1
Symptoms, Examples of Descriptors, and Stony Brook Scale Items

Symptom	Descriptor examples	Stony Brook Scale items	
		TRS item nos.	BPC item nos.
Control deficits	Delinquent acts, doesn't control self, evasion of rules	14, 17, 18, 19, 20, 21, 31, 32, 36, 39	4, 8, 10, 11, 18, 25, 27, 29, 31, 38, 40, 46, 47, 48, 51, 53
Negative affect	Excitable, irritable, low frustration tolerance	9, 12, 15, 18	27, 30, 46, 53
Aggressive interpersonal	Bullies, fights, won't mind	15, 17, 19, 20, 29, 31, 38	8, 10, 25, 38, 40, 47, 48, 51
Judgment deficits	Acts on impulse, immature, lacks good judgment	6, 35, 37	3, 12
Hyperactivity	Always on the go, overactive, restless	5	44, 2
Inattention	Can't concentrate, distractible, forgetful	7, 8, 11	20, 22, 34, 45
Fidgetiness	Can't sit still, fiddles with objects, shifts in seat	1	—
Anxiety	Fearful, nervous, withdrawn	22, 33, 34	6, 14, 15, 32, 52
Self-esteem deficits	Self-blame, self-pity, doesn't feel worthwhile	26	6, 9, 21
Depression	Cries a lot, sad, unhappy	10, 13	39
Uncoordination	Awkward, messy, poor drawing and handwriting	4	43
Speech disturbance	Hard to understand, lisps, stutters	—	24

Note. TRS = Connors Teacher Rating Scale; BPC = Peterson-Quay Behavior Problem Checklist.

Extracted from O'Leary & Steen (1982).

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APPENDIX 2 The Stony Brooke Scale -97-

CHILD'S NAME: _____ AGE:_____(yrs)____(mts) SEX:_____ TEACHER:_____ HOME Tel_____

Please enter a cross (X) in the square that best describes the degree of activity of this child's behaviour. The 39 behaviours that are to be rated are presented in the left-hand column. Please ensure that you respond to all 39 behaviours, and enter the response that most accurately describes this particular child's behaviour.

Observation	Degree of Activity			
	Not at all	Just a little	Pretty much	Very much
1. Constantly fidgeting				
2. Hums and makes other odd noises				
3. Demands must be met immediately, gets frustrated				
4. Coordination poor				
5. Restless or overactive				
6. Excitable, impulsive				
7. Inattentive, easily distracted				
8. Fails to finish things he starts, easily distracted				
9. Sensitive to criticism				
10. Overly serious or sad				
11. Daydreams				
12. Sullen or sulky				
13. Cries				
14. Disturbs other children				
15. Quarrelsome				
16. Mood changes quickly and drastically				
17. Acts "smart"				
18. Destructive				
19. Steals				
20. Lies				
21. Temper outbursts, explosive, unpredictable behaviour				
22. Isolates himself from other children				
23. Appears to be unaccepted by group				
24. Appears to be easily led				
25. No sense of fair play				
26. Appears to lack leadership				
27. Does not get along with opposite sex				
28. Does not get along with the same sex				
29. Teases other children, interferes with their activities				
30. Submissive				
31. Defiant				
32. Impudent				
33. Shy				
34. Fearful				
35. Excessive demands for teacher's attention				
36. Stubborn				
37. Overly anxious to please				
38. Uncooperative				
39. Attendance problem				

CHILD'S NAME: _____

Please enter a cross (X) in the square that best describes the degree of activity of this child's behaviour. The 55 behaviours that are to be rated are presented in the left-hand column. Please ensure that you respond to all 55 behaviours, and enter the response that most accurately describes this particular child's behaviour.

	Not A Problem	Mild Problem	Severe Problem
1. Oddness, bizarre behavior			
2. Restlessness, ability to sit still			
3. Attention-seeking, "show-off" behavior			
4. Stays out late at night			
5. Doesn't know how to have fun; behaves like a little adult			
6. Self-consciousness; easily embarrassed			
7. Fixed expression, lack of emotional reactivity			
8. Disruptiveness; tendency to annoy and bother others			
9. Feelings of inferiority			
10. Steals in company with others			
11. Boisterousness, rowdiness			
12. Crying over minor annoyances and hurts			
13. Preoccupation; "in a world of his/her own"			
14. Shyness, bashfulness			
15. Social withdrawal, preference for solitary activities			
16. Dislike for school			
17. Jealousy over attention paid other children			
18. Belongs to a gang			
19. Repetitive speech			
20. Short attention span			
21. Lack of self-confidence			
22. Inattentiveness to what others say			
23. Easily flustered and confused			
24. Incoherent speech			
25. Fighting			
26. Loyal to delinquent friends			
27. Temper tantrums			
28. Reticence, secretiveness			
29. Truancy from school			
30. Hypersensitivity; feelings easily hurt			
31. Laziness in school and in performance of other tasks			
32. Anxiety, chronic general fearfulness			
33. Irresponsibilit,, undependability			
34. Excessive daydreaming			

	Not A Problem	Mild Problem	Severe Problem
35. Masturbation			
36. Has bad companions			
37. Tension, inability to relax			
38. Disobedience, difficulty in disciplinary control			
39. Depression, chronic sadness			
40. Uncooperativeness in group situations			
41. Aloofness, social reserve			
42. Passivity, suggestibility; easily led by others			
43. Clumsiness, awkwardness, poor muscular coordination			
44. Hyperactivity; "always on the go"			
45. Distractibility			
46. Destructiveness in regard to his/her own and/or other's property			
47. Negativism, tendency to do the opposite of what is requested			
48. Impertinence, sauciness			
49. Sluggishness, lethargy			
50. Drowsiness			
51. Profane language, swearing, cursing			
52. Nervousness, jitteriness, jumpiness; easily startled			
53. Irritability; hot-tempered, easily aroused to anger			
54. Enuresis, bed-wetting			
55. Often has physical complaints, e.g., headaches, stomachaches			

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