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HYPERKINESIS: AN EXAMINATION OF DIAGNOSTIC
// TERMS AMONG PHYSICIANS

A THESIS
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HYPERKINESIS: AN EXAMINATION OF DIAGNOSTIC
TERMS AMONG PHYSICIANS

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ABSTRACT

An exploratory study was undertaken in an attempt to define physician's orientations in the diagnosis of hyperkinesis. Sixty eight physicians were asked to rank the 10 most frequently reported symptoms of hyperkinesis (Clements, 1966) and 10 symptoms frequently observed in children by the author at a child evaluation clinic. Factor analysis of the data suggested that there was at least two primary orientations among physicians evaluating hyperkinetic children (neurological and emotional) and possibly a third orientation involving physical-developmental deficits. The results seemed to indicate that the only specific indicators of hyperkinesis were behavioral items. Suggestions were provided for follow-up studies.

CHAPTER I

INTRODUCTION

Hyperkinesis is one of several ambiguous labels that have been adopted by medical and social scientists in an attempt to isolate and define behavioral problems in children. The term was first used in a diagnostic context by Laufer and Denhoff (1957) who noticed the frequent association of large muscle hyperactivity in children with brain dysfunction. This observation led to a proposed syndrome referred to as hyperkinetic impulse disorder. A subsequent study by Laufer, Denhoff, and Solomons (1957) led to the postulation of a disturbance in function of the diencephalon and associated cortical areas. The evidence for this theory was not conclusive, but the concept of minimal brain dysfunction became part of the definition of the syndrome. This study set the stage for an avalanche of research on aspects of hyperkinesis such as symptomatology (Clements, 1966; Routh & Roberts, 1972), associated learning problems (Laufer & Denhoff, 1957; Frieburgs & Douglas, 1969), and activity level (Werry & Sprague, 1969), just to mention a few. The evidence that has been found in all this research is contradictory, to say the least, and has produced many questions but few answers.

One of the most confusing aspects of hyperkinesis is the lack of specific definitional constructs. Disagreement

on the use of the term is reflected by the wide range of behavioral and socially maladaptive characteristics that are associated with the diagnostic category. The main focus of investigators is on symptomatology: emphasizing motor activity and associated problems in behavioral, social, and psychological traits. Clements (1966) reviewed over 100 publications on minimal brain dysfunction. He found a large number of symptoms which were general and conflicting. However, he did come up with a list of the ten most frequently cited characteristics. These characteristics were, in order of frequency: hyperactivity, perceptual-motor impairments, emotional lability, general coordination deficits, disorders of attention, impulsivity, disorders of memory and thinking, specific learning disabilities, disorders of speech and hearing, and equivocal neurological signs and EEG irregularities. However, it was noted that variability beyond that expected for age and measured intelligence was present throughout most of these general characteristics as well as for specific symptoms under each category. Schrager, Lindy, Harrison, McDermouth, and Killins (1966) conducted a survey of pediatricians, teachers, psychologists, psychiatrists, and social workers to determine the most characteristic behaviors of hyperkinetic children. The results provided a consensually validated list of 6 behaviors: hard to manage, fidgets and restless,

cannot sit still, easily distracted, inattentive, and cannot tolerate frustration. Stewart, Pitts, Craig, and Dieruf (1966) interviewed the mothers of 37 hyperkinetic children and found that over two thirds of the children were described as: talks too much, cannot sit still, wears out toys and furniture, fidgets, does not complete assignments, and does not stay with games. Lapouse and Monk (1958) found that approximately 50% of children aged 6 to 12 were described by their mothers as being overactive, while approximately one third were described as restless. A review of the research on activity level by Cromwell, Baumeister, and Hawkins (1963) showed that the majority of studies failed to support quantitative differences between the behaviors of hyperkinetic and non-hyperkinetic children. Thus it appears that quantitative differences in activity level may be secondary to some other aspect of behavior.

An essential element of activity level is the relationship between motor behavior and the environment. The activity of hyperkinetic children is characteristically interpreted as being situationally or socially inappropriate (McConnell, Cromwell, Bialer, & Son, 1964; McFarland, Peacock, & Watson, 1966; Werry, 1968). Werry and Sprague (1969) emphasize the point that while the hyperkinetic child may exhibit an activity level in the upper limits of the range of motor activity in the population, there is also a qualitative

characteristic of activity that is situationally inappropriate. This element of the hyperkinetic child's behavior inevitably results in conflict with, and subsequent disruption of, the socio-familial environment. The negative terms used by professionals and parents to describe hyperkinetic children suggests that the labels may reflect more of their feelings about the child than the actual behavior he exhibits. This concept is supported by a study in which 64 children diagnosed as hyperkinetic were re-evaluated five years after the initial diagnosis (Weiss, Minde, Werry, Douglas, & Nemeth, 1971). It was found that whereas restlessness had been the primary complaint for each child at the initial evaluation, it was no longer the chief complaint for any child. There was also a highly significant reduction in hyperactive scores, as measured by a rating scale, for the group. This reduction in scores could be explained by a regression to the mean or a result of being five years older, but a comparison with 24 non-hyperkinetic children from the same classroom showed that the previously described hyperkinetic children exhibited significantly more "organized behavior unrelated to classroom activity" (Weiss, et al, 1971, p. 411). However, the restlessness was no longer displayed through locomotion, but rather by sedentary activity such as playing with pencils. Thus it appears that hyperactivity is not necessarily defined by

activity alone, but by the relatedness of the activity to the situation.

Although excess motor activity is the most commonly reported symptom in hyperkinetic children, learning problems are also frequently cited (Chess, 1960; Menkes, Rowe, & Menkes, 1967; Millichap, Aymat, Sturgis, Larsen, & Egan, 1968; Stewart, Pitts, Craig, & Dieruf, 1966; Werry, 1968; Wunderlich, 1969). However, the learning performance of hyperkinetic children is variable in both day to day and task to task performance (Thelander, Phelps, & Kirk, 1958; Newman, 1956). The specific nature of learning deficits is unclear as research on this subject has yielded inconsistent findings. Laufer and Denhoff (1957) and Laufer, et al (1957) reported that the hyperactive children in their studies exhibited learning problems in arithmetic, handwriting, and reading. Frieburgs and Douglas (1969) failed to find particular difficulty with arithmetic or number concepts in their study of hyperkinetic children. A number of studies have attributed visual motor dysfunctions to learning problems in hyperkinetic children (Laufer, et al, 1957; Thelander, et al, 1958; Werry, 1968; Werry & Sprague, 1969; Werry, Weiss, Douglas, & Martin, 1966). However, there is very little verification as to the skills affected or the mechanisms responsible. Anderson (1963) reported reversal and mirroring problems in reading. This finding

was also reported by Burks (1960) who also found poor performance on achievement tests. Chess (1960) reported that the hyperkinetic children she studied evidenced variability in both incidence and type of learning problem, and that a number of children performed adequately on achievement tests even though they did not perform well on a day to day basis. This finding seems to follow the assumption that hyperkinetic children have limited attention span, but it does not make sense to imply that a child cannot stay with a task when he exhibits the ability to perform well on certain days. Nevertheless, it seems important to differentiate limited attention span from learning problems.

Routh and Roberts (1972) examined 89 children referred to a child development clinic because of poor school performance. A multidisciplinary team obtained 16 measures of the most frequently hypothesized symptoms of minimal brain dysfunction. Statistical analysis of the findings indicated few significant relationships between symptoms when age and IQ were statistically controlled. The authors concluded that the results do not support a behavioral syndrome of minimal brain dysfunction.

The findings in the literature seem to refute, rather than support, the concept of a specific behavioral syndrome. The critical issue in the diagnosis and treatment of

hyperkinesis seems to be dependent upon what practitioners are looking for. However, it is not very clear as to what the important factors are in the evaluation procedure. This study was an exploratory project that attempted to identify the orientations of a sample of physicians and the significant factors that account for the variability in definitional constructs.

CHAPTER II

METHOD

Stimuli. The stimuli for the study were a cover-letter and a questionnaire containing the 10 most frequently reported symptoms of minimal brain dysfunction as cited by Clements (1966) and 10 symptoms frequently observed in children seen by the author at a child evaluation clinic (see Appendices A & B). The symptoms were randomly grouped in clusters of 5 to insure that the order of presentation of the symptoms would not indicate which items were most important to the experimenter.

Subjects. One hundred and fifty physicians currently active in child treatment were randomly selected from the 1975 Physicians Directory for North Carolina. Questionnaires were sent to each physician and a follow-up letter (Appendix C) was mailed to each individual who did not respond within one month. Twenty one of the individuals could not be reached, reducing the sample size to 129 physicians that were contacted. Sixty eight of these remaining physicians responded to the questionnaire (a return rate of 53%) providing a final sample of 38 pediatricians, 11 child psychiatrists, 14 family practitioners, and 5 general practitioners.

Procedure. Each individual was instructed to inspect the list of symptoms and place a check mark next to 10 of

the symptoms considered most relevant to hyperkinesis, and then rank these symptoms from 1 to 10 in the space provided on the questionnaire. Subjects were further instructed to rank the remaining symptoms from 11 to 20 and then double-check their rankings to make sure they were satisfied with the order. Information was also collected on each individual's years of experience, medical specialty, and type of practice, i. e., private, group, etc.

CHAPTER III

RESULTS

The symptoms were numbered from 1 to 20 (no specific order) and each physician's rank was entered under the appropriate symptom. Symptoms which were not scored by a physician were assigned a mean rank relative to the rank order of the scored symptoms for that individual. The raw data is presented in Appendix D. The main emphasis of the analysis was to match the physicians to identify groups in which there were different diagnostic orientations. This was accomplished by an obverse factor analysis (Fruchter, 1954, p. 176) in which the physicians were used as variables, while the symptoms were used as cases. Spearman rank correlations were computed for the responses of all pairs of physicians (these data will not be presented as the correlations are secondary to the purpose of the study). The correlation matrix was then factor analyzed (BMD program 03M, Dixon, 1971, p. 169). Five factors were extracted from the initial correlation matrix and orthogonally rotated. The rotated factor matrix is shown in Table 1. Physicians were grouped according to their highest factor loading (only factor loadings of .4 and above were examined). When there was no clear emphasis of one factor over another (physicians 5, 17, 34, 50, & 64 emphasize 2 factors that are not separated by a loading of greater than .05), the individuals

Table 1.

	Factor loadings from rotated factor matrix				
	1	2	Factor 3	4	5
1	.41	.64	.40	.26	.19
2	.77	.23	.28	.31	-.01
3	.74	.17	.43	.34	.14
4	.64	.20	.42	.47	.09
5	.54	.53	.22	.17	.24
6	.64	.04	.48	.45	-.09
7	.66	.16	.46	.45	-.07
8	.64	.08	.50	.43	.10
9	.72	-.01	.18	.52	-.15
10	.67	.28	.47	.38	-.13
11	.46	.43	.03	.52	.03
12	.83	.21	.25	.32	-.07
13	.55	.15	.66	.29	.11
14	.39	.20	.53	.60	-.22
15	.38	.48	.11	.66	-.17
16	.65	-.06	.31	.59	.01
17	.46	.38	.48	.27	.05
18	.42	.25	.21	.78	-.03
P 19	.68	-.02	.30	.54	.15
h 20	.59	.33	.40	.52	.14
y 21	.81	.20	.21	.37	-.20
s 22	.62	.22	.40	.20	.21
i 23	.23	.69	.14	.38	.22
c 24	.66	.37	.42	.35	.08
i 25	.68	.49	.32	.28	-.06
a 26	.74	.27	.38	.25	.03
n 27	.37	.51	.16	.67	-.02
28	.60	.20	.42	.47	-.20
29	.82	.13	.21	.39	-.10
30	.81	.19	.39	.30	.04
31	.39	.36	.55	.43	.14
32	.69	.22	.12	.53	-.02
33	.68	.17	.18	.47	.31
34	.54	.14	.49	.53	-.12
35	.48	.59	.13	.18	.25
36	-.13	.89	.19	-.02	-.19
37	.71	.38	.19	.46	.13
38	.35	.38	.65	.39	.06
39	.76	.40	-.13	.15	-.06
40	.39	.44	.26	.62	.10
41	.69	.24	-.06	.38	-.10
42	.61	.38	.37	.46	.15

Table 1 (continued)

	Factor				
	1	2	3	4	5
43	.47	.10	.18	.71	.25
44	.43	.48	.03	.08	-.63
45	.72	.31	.44	.28	.08
46	.31	.18	.56	.62	-.12
47	.28	.31	.47	.58	-.37
48	.01	.09	-.11	-.02	.63
49	.26	.11	.17	.73	.06
50	.58	.11	.56	.44	-.13
P 51	.01	.27	.76	-.14	-.27
h 52	-.13	.89	.19	-.02	-.19
y 53	.66	.25	.37	.34	.32
s 54	.72	.44	.17	.42	.13
i 55	.73	-.02	.49	.11	-.19
c 56	.58	-.05	.12	.71	.01
i 57	.84	.02	.34	.28	-.14
a 58	.43	.13	.58	.53	-.15
n 59	.29	.23	.26	.69	.08
60	.62	.10	.30	.53	.14
61	.68	.30	.36	.45	.01
62	.76	.19	.32	.42	-.04
63	.73	.23	.19	.39	.18
64	.39	.52	.08	.51	-.21
65	.30	.28	.48	.28	.25
66	.39	.59	.32	.17	.35
67	.41	.25	.68	.42	-.01
68	.35	.68	.13	.30	.08

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were not assigned to a group to avoid contamination due to nonhomogeneous cases. Four distinct factor groups were obtained from the first four factors. The fifth factor was an artifact of the statistical procedure, as only 2 physicians emphasized this factor and the correlation between them was highly negative.

Mean ranks were computed for each symptom in all 4 groups. The symptom rankings from the largest group (factor 1, n=34) were arranged in order from lowest to highest, according to mean rank. The comparison of symptom rankings across groups is presented in Table 2. A graphic representation of the comparison is provided in Figure 1. Visual inspection of the graph shows the general agreement among all 4 groups upon the first few symptoms and the last few symptoms. The middle range of the graph shows the variation in ranking among the groups.

None of the groups agree with the order of importance of symptoms cited in the literature (see Table 3). This is possibly explained by the fact that the symptoms in the alleged syndrome are not ordered in terms of any categorical relationship, while the significant symptoms in this study (ranked in the top two thirds of the 20 items), on the other hand, do appear to be clustered in terms of their categorical relatedness to each other. All of the groups place their primary emphasis (first five ranks) on the behavioral

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Table 2.

Mean ranks of symptoms across factor groups

	Group			
	1	2	3	4
1 Hyperactivity	1.3	2.4	1.6	3.0
2 Impulsivity	3.1	6.6	4.6	2.8
3 Dis of Atten	3.3	6.3	2.6	3.9
4 Emot Lability	5.8	6.3	5.1	4.9
5 Gen Coord Def	6.0	9.1	12.6	5.8
6 Perc Mtr Impts	7.0	15.8	10.1	11.3
7 Spec Lrng Dis	7.1	11.3	7.5	5.0
8 EEG Irreg	7.1	12.4	10.8	13.5
9 Irreg Sleep	9.0	4.9	9.6	10.9
10 Inj Prone	10.1	10.8	11.8	8.2
11 Mem & Thnkg Dis	10.2	8.2	5.9	10.2
12 Speech & Hearing	12.4	11.5	11.2	12.2
13 Enuresis	14.1	6.9	14.4	14.5
14 Thumb/Nail	14.4	7.6	15.6	14.3
15 Phys Immat	14.9	16.3	14.8	12.3
16 Low IQ	15.2	11.6	10.2	14.5
17 Headaches	15.6	17.1	15.2	14.8
18 Encopresis	16.3	15.6	15.2	16.2
19 Allergies	17.1	13.8	13.4	15.9
20 Vit Defncy	18.8	18.6	17.1	16.3

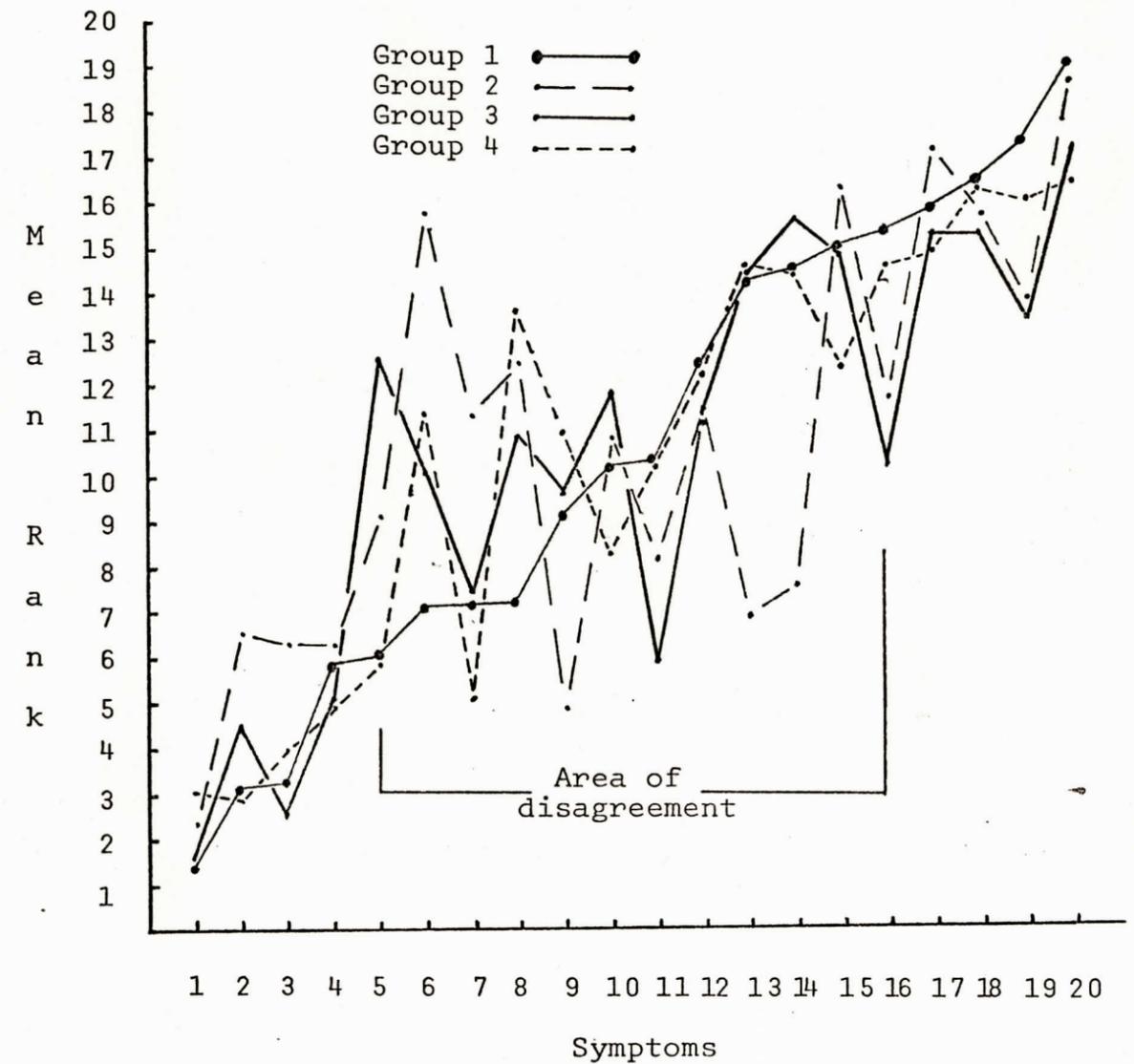


Figure 1: mean ranks of symptoms across factor groups

Table 3

Symptoms listed in order of mean rank by group

Group			
1	2	3	4
Hyperactivity	Hyperactivity	Hyperactivity	Impulsivity
Impulsivity	Irreg Sleep	Dis of Atten	Hyperactivity
Dis of Atten	Dis of Atten	Impulsivity	Dis of Atten
Emot Lability	Emot Lability	Emot Lability	Emot Lability
Coord Deficits	Impulsivity	Mem & Thinking	Spec Lng Disab
Perc Mtr Impts	Enuresis	Spec Lng Disab	Coord Deficits
Spec Lng Disab	Thumb/Nail	Irreg Sleep	Inj Prone
Neuro & EEG	Mem & Thinking	Perc Mtr Impts	Mem & Thinking
Irreg Sleep	Coord Deficits	Low IQ	Irreg Sleep
Inj Prone	Inj Prone	Neuro & EEG	Perc Mtr Impts
Mem & Thinking	Spec Lng Disab	Speech & Hrng	Speech & Hrng
Speech & Hrng	Speech & Hrng	Inj Prone	Phys Immat
Enuresis	Low IQ	Coord Deficits	Neuro & EEG
Thumb/Nail	Neuro & EEG	Allergies	Thumb/Nail
Phys Immat	Allergies	Phys Immat	Enuresis
Low IQ	Encopresis	Headaches	Low IQ
Headaches	Perc Mtr Impts	Encopresis	Headaches
Encopresis	Phys Immat	Enuresis	Allergies
Allergies	Headaches	Thumb/Nail	Encopresis
Vitmn Def	Vitmn Def	Vitmn Def	Vitmn Def

symptoms, i. e., hyperactivity, impulsivity, disorders of attention, and emotional lability are ranked in the first five symptoms, which is not surprising as these symptoms are readily observable without special diagnostic tools and they seem to be the complaints made by parents and teachers who refer children to physicians. It is also interesting to note that injury proneness is considered important by all groups and that it is consistently ranked next to general coordination deficits. This relationship is quite logical and further supports the idea that the syndrome cited in the literature is ordered rather arbitrarily. All of the groups also consistently rank physical immaturity, headaches, allergies, encopresis, and vitamin deficiency in the lower third of the 20 symptoms, suggesting that these symptoms are not important to the diagnosis of hyperkinesis.

Examination of the symptoms ordered 6 through 12 shows the major differences between groups and indicates the important factors in the related physician's orientations. Groups 1 and 2 exhibit the clearest indications of specific orientations. Group 1 appears to be neurologically oriented, i. e., the symptoms given secondary emphasis are perceptual-motor impairments, specific learning disabilities, and equivocal neurological signs and EEG irregularities. There is moderate emphasis on several symptoms that can be related to anxiety, physical deficits, or developmental

problems (irregular sleep, injury proneness, disorders of memory and thinking, and speech and hearing disorders). The significance of these symptoms is not clear, but the fact that 2 anxiety-related symptoms (enuresis and thumb sucking and nail biting, etc.) are not ranked as important by this group suggests that there is possibly a tertiary emphasis on physical-developmental problems. Group 2 seems to be oriented towards emotional problems as they emphasize the anxiety related symptoms, i. e., sleep disturbances, enuresis, and thumb sucking and nail biting. The specific neurological indicator (neurological signs and EEG irregularities) is not ranked as important by this group, clearly contrasting with group 1. The symptoms ranked as moderately important (disorders of memory and thinking, coordination deficits, injury proneness, specific learning disabilities, and disorders of speech and hearing) seem to indicate that physical-developmental problems may also be significant to the orientation of this group. Group 3 is a curious lot. The neurologically-related symptoms are considered important by this group, but these symptoms are not clustered together and low IQ has been inserted as a critical item. Group 3 also ranks the anxiety-related symptoms emphasized by group 2 as unimportant. The orientation of this group is not clear. The individuals in this group generally showed loadings on several factors, and it appears that the group

does not represent an important factor. A larger sample size is needed to clarify the meaning of this group. Group 4 is the clearest indicator of which symptoms the individuals in the group did not consider important (many of the subjects in this group failed to rank 10 of the symptoms, stating that they did not consider these symptoms relevant to hyperkinesis). This group considers the more specific neurological and emotional symptoms (neurological signs and EEG irregularities, enuresis, thumb sucking and nail biting) unimportant. The symptoms ranked as important by this group (specific learning disabilities, coordination deficits, injury proneness, disorders of memory and thinking, irregular sleep, perceptual-motor impairments, speech and hearing disorders, and physical immaturity) are all related to physical deficiencies and developmental problems, suggesting that the orientation of the group is physical-developmental. Again, however, a larger sample size is needed to clarify the position of this group.

CHAPTER IV

DISCUSSION

The sample size of the study is insufficient to justify definite conclusions from the data as an n of 200 is required for a correlation procedure with 20 items (Brigner, Note 1; Terrant, Note 2). However, there are clear trends among the physician's rankings that warrant interpretation. The results are not in agreement with the syndrome cited by Clements (1966). The data suggests that the only symptoms that are specific indicators of the hyperkinetic syndrome are the behavioral items. There seems to be clear disagreement among physicians in terms of diagnostic orientations. The data suggests that there are at least two clear orientations among physicians (neurological and emotional), and possibly a third orientation revolving around physical-developmental deficits. This is quite logical, as deficits in any of these areas can possibly account for the behavioral symptoms emphasized by parents and professionals. However, the differences in orientations may have significant impact on adequate diagnosis and treatment, as critical problem areas may be overlooked if the consulting physician's diagnostic framework is too rigid. The disagreement among physicians argues in favor of a more thorough diagnostic process, such as multidisciplinary evaluation and differential diagnosis.

Further exploration of this area is needed to clarify the findings of this study, utilizing an adequate sample size with equal numbers of specific disciplines represented in the data. It would seem reasonable for follow-up studies to omit headaches, allergies, encopresis, and vitamin deficiencies from the list of symptoms and either concentrate on the remaining symptoms or add others that may be relevant to hyperkinesis. A rating system might also be helpful as this type of scoring scheme can take advantage of parametric statistical analysis as well as nonparametric procedures, thus giving the experimenter more flexibility.

Reference Notes

1. Brigner, W. Personal communication, March 1975
2. Terrant, F. R. Personal communication, April 1976

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Appendix A: Cover letter

Dear Dr. _____,

I am a graduate student at Appalachian State University currently working on my Master's Thesis. The thrust of my research is aimed at an evaluation of definitional constructs of hyperkinesis.

I realize that you are probably pressed for time, but I would appreciate your taking 15 minutes or so to fill out the enclosed form and mail it in the provided envelope as soon as possible. Please fill the form out yourself and avoid any consultation or use of reference material in filling out the form. It is essential that you express your opinion. If you participate in this study, you will receive a summary of my research as soon as it is completed.

Thank you for your attention to this matter. Your prompt response will be greatly appreciated.

Appendix B: Questionnaire

Title (Pediatrician, General Practitioner, etc.) _____

Years in Practice _____

Type of Practice (Private, Group, etc.) _____

Use the following directions for the symptoms listed below:

- 1) Place a checkmark by 10 of the symptoms which are most relevant to hyperkinesis
- 2) Rank these symptoms from 1 to 10 according to their respective relevance to hyperkinesis in the space provided
- 3) Rank the remaining 10 symptoms in order of their relevance to hyperkinesis in the space provided
- 4) Check to make sure that you are satisfied with the rankings

- | | |
|---|--|
| <input type="checkbox"/> Irregular sleep patterns | <input type="checkbox"/> Physical immaturity |
| <input type="checkbox"/> Enuresis | <input type="checkbox"/> Injury prone |
| <input type="checkbox"/> Disorders of memory & thinking | <input type="checkbox"/> Encopresis |
| <input type="checkbox"/> Impulsivity | <input type="checkbox"/> Specific learning disabilities |
| <input type="checkbox"/> Allergies | <input type="checkbox"/> Low IQ (as measured by IQ tests) |
| <input type="checkbox"/> Thumb sucking, nail biting | <input type="checkbox"/> Headaches |
| <input type="checkbox"/> Disorders of speech & hearing | <input type="checkbox"/> Perceptual-motor impairments |
| <input type="checkbox"/> General coordination deficits | <input type="checkbox"/> Equivocal neurological signs & EEG irreg. |
| <input type="checkbox"/> Emotional lability | <input type="checkbox"/> Disorders of attention |
| <input type="checkbox"/> Hyperactivity | <input type="checkbox"/> Vitamin deficiency |

Symptoms ranked from 1 to 10

1
2
3
4
5
6
7
8
9
10

Remaining symptoms

11
12
13
14
15
16
17
18
19
20

Appendix C: Follow-up letter

Dear Dr. _____,

A check of the list of questionnaires I have mailed out indicates that I have not received a return from you. In case you have failed to receive or misplaced the previous form, I am enclosing another. This form will only take 10 minutes of your time. I will greatly appreciate your response.

Thank you for your attention to this letter. I hope to receive your reply shortly.

Appendix D.

Raw data: rankings of symptoms by physicians in order of discipline

Symptoms	Exp. (yrs)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 H y p e r a c t i v e	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 D i s a t t e n	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3 M e m & T h n k	6	9	8	7	9	10	7	5	10	4	7	10	4	7	10	4	7	10	4	7
4 I m p u l s i v i t y	4	3	3	3	4	3	3	2	3	2	15.5	3	2	3	2	3	2	3	2	3
5 S p e e c h / H r n g	12	8	15	15	20	8	11	14	2	11	14	2	11	14	2	11	14	2	11	14
6 C o o r d D e f	9	4	10	8	3	9	6	8	8	5	8	8	5	4	8	5	4	8	5	4
7 E m o t L a b i l i t y	3	6	5	1	6	2	4	6	6	8	14	6	6	8	14	6	6	8	14	6
8 S p e c L n g D i s	15	10	7	5	15	4	8	7	4	9	6	6	4	6	6	4	6	6	4	6
9 P e r c M t r I m p	17	5	4	10	16	6	5	4	9	10	14	10	14	4	9	10	14	4	9	10
10 N e u r o & E E G	8	7	6	4	5	7	9	9	15.5	7	12	15.5	7	9	15.5	7	12	15.5	7	9
11 S l e e p D i s t	5	11	9	11	8	15.5	17	12	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
12 E n u r e s i s	11	14	12	17	7	15.5	15.5	14	11	19	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
13 A l l e r g i e s	18	18	20	19	14	15	14	11	19	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
14 T h u m b / N a i l	13	12	16	14	11	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
15 P h y s I m m a t y	20	17	11	12	12	15.5	15.5	13	17	13	10	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
16 I n j P r o n e	7	16	13	9	13	15.5	15.5	10	18	10	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
17 E n c o P r e s i s	14	15	18	18	14	10	13	14	15	18	15	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
18 L o w I Q	10	20	17	13	13	15.5	15.5	16	18	16	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
19 H e a d a c h e s	16	13	14	16	10	17	18	13	14	10	17	18	13	14	10	17	18	13	14	10
20 V i t m n D e f	19	19	19	20	8	12	26	17	5	24	12	17	5	24	12	17	5	24	12	17

P e d i a t r i c i a n s

Appendix D (continued)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Exp
	18	1	3	14	2	14	5	4	14	14	14	14	14	14	14	7	14	14	14	14	28
	19	1	6	12	2	13	4	3	7	5	14	20	11	15	10	9	16	17	18	19	12
	20	1	2	7	3	16	5	4	9	11	6	16	16	16	10	16	16	16	16	16	23
	21	2	4	9	6	12	3	10	1	8	5	11	13	19	16	7	18	15	14	20	4
	22	1	2	11	3	18	4	6	17	5	7	12	13	10	14	9	15	8	16	20	38
	23	1	3	15.5	2	15.5	10	4	15.5	15.5	5	8	15.5	6	15.5	7	15.5	9	15.5	15.5	14
	24	1	2	12	3	14	9	5	6	7	8	15	18	13	16	11	20	20	17	19	23
	25	1	3	6	2	14	4	11	5	12	7	9	17	15	19	10	16	13	18	20	12
	26	1	3	11	2	12	4	7	14	5	6	10	15	19	13	9	16	8	17	20	7
	27	3	6	8	1	15.5	2	4	5	15.5	15.5	7	15.5	9	15.5	10	15.5	15.5	15.5	15.5	10
	28	1	3	7	2	8	9	5	5	6	12	11	15	20	18	4	16	13	14	19	15
	29	1	2	10	3	11	4	9	6	7	5	15	16	17	12	8	14	19	13	20	6
	30	1	3	11	2	14	8	7	6	5	4	9	17	19	13	10	16	12	15	20	7
	31	1	3	5	4	10	15.5	2	6	15.5	7	8	15.5	15.5	15.5	9	15.5	15.5	15.5	15.5	50
	32	1	2	18	5	9	6	3	10	10	7	12	16	19	11	4	17	14	13	20	15
	33	1	2	18	3	14	9	4	8	8	6	7	12	16	19	5	17	15	11	20	14
	34	3	2	7	4	8	5	1	6	9	10	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	3
	35	2	6	13	3	10	4	8	9	18	5	1	12	7	11	17	16	14	19	20	10
	36	6	10	3	11	5	13	7	8	18	19	2	1	12	4	15	14	9	17	20	20
	37	1	2	14	4	11	6	3	8	7	10	5	12	19	15	17	13	18	16	20	15
	38	1	2	6	3	11	8	4	9	10	14	5	18	13	15	12	16	19	17	20	10

P e d i a t r i c i a n s

39	1	3	17	2	15	5	10	4	11	6	8	9	16	7	19	13	14	20	12	18	14
40	1	2	8	3	11	9	4	7	13	15	5	10	17	18	14	6	19	20	12	16	19
41	3	12	10	1	13	2	11	7	8	6	9	18	20	4	14	5	19	17	15	16	10
42	1	4	5	3	14	6	2	9	12	7	8	15	19	13	11	10	16	17	18	20	21
43	6	4	12	1	13	5	2	8	11	10	9	17	15	16	3	7	19	18	14	20	24
44	1	6	12	16	2	5	13	3	10	14	11	4	20	9	15	7	17	8	18	19	10
45	1	3	7	2	12	10	5	6	8	4	9	11	20	14	13	15	18	16	17	19	10
46	1	5	6	2	15.5	10	3	7	9	15.5	15.5	15.5	15.5	15.5	4	15.5	8	15.5	15.5	15.5	18
47	2	4	8	1	9	6	7	3	12	18	15	14	18	13	11	10	18	5	18	18	13

F a m P r a c t

Appendix D (continued)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Exp
	48	1	2	10	6	12	5	17	7	9	1	2	11	19	4	8	3	16	14	20	16
	49	18	15	10	2	13.5	1	4	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	24
	50	1	4	7	2	15.5	5	3	8	9	15.5	15.5	15.5	15.5	15.5	15.5	15.5	10	15.5	15.5	10
	51	2	4	3	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	1	12.5	12.5	10
	52	6	10	3	11	5	13	7	8	18	19	2	1	12	4	15	14	9	17	20	20

F. C h i l d P s y

53	1	3	9	2	15	6	7	11	5	8	4	14	10	17	12	13	19	18	16	20	12
54	1	3	13	2	15	6	4	7	8	9	5	12	20	11	18	10	14	17	16	19	4
55	2	3	6	10	8	7	12	4	1	5	11	16	15	17	9	14	18	13	19	20	16
56	1	7	18	4	12	6	3	2	8	9	11	19	15	17	10	5	20	16	13	14	3
57	3	2	9	8	10	6	7	4	1	5	13	15	19	14	12	11	16	17	18	20	2
58	1	4	6	3	8	9	2	7	5	15	15	15	15	15	15	15	15	15	15	15	10
59	1	6	15	3	7	8	2	10	9	18	4	19	14	17	13	5	20	12	11	16	3
60	3	2	15	1	10	8	4	7	11	5	12	14	19	18	6	9	16	13	17	20	10
61	1	3	8	2	13	10	5	4	9	7	11	12	19	15	16	6	14	17	19	19	10
62	1	5	11	3	9	2	4	8	5	7	10	16	19	15	14	12	17	13	18	20	13
63	1	5	15.5	3	15.5	4	2	8	7	6	10	9	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	14

G. P.

64	1	9	6	4	11	3	2	8	14	15	16	4	19	10	18	7	12	17	13	20	25
65	4	1	2	3	14	15	8	6	16	7	10	13	5	17	18	9	12	19	11	20	15
66	1	2	8	3	15.5	15.5	4	15.5	15.5	6	7	10	15.5	5	15.5	9	15.5	15.5	15.5	15.5	13
67	1	2	9	3	11	12	4	6	7	13	8	17	15	18	14	10	16	5	19	20	8
68	1	11	5	3	7	2	4	15	14	13	6	8	10	9	17	12	16	18	19	20	38