SUCCESS AND FAILURE IN THE CONDITIONING TREATMENT OF CHILDHOOD ENURESIS

ROGER T. T. MORGAN, B.A.

SUBMITTED FOR THE DEGREE OF Ph.D.
UNIVERSITY OF LEICESTER SCHOOL OF SOCIAL WORK

1973
ACKNOWLEDGEMENTS

Acknowledgement is made to the council of the London Borough of Barnet for the provision of extensive facilities for the present research, and in particular to Dr. Gordon Young for his unflagging support and cooperation throughout the period of research. Gratitude is also expressed to the staff of the Vale Drive special investigation clinic, and especially to Mrs. Bernice MacKenzie and Mrs. Margaret Harper for their constant and invaluable assistance.

Acknowledgement is also made to Professor Derek Jehu for securing judges for the attitude scales and for his understanding supervision of the research, and to Dr. Keith Turner for his invaluable advice at many stages of the work.
<table>
<thead>
<tr>
<th>Page</th>
<th>4 - Termination (retrospective phase)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Introduction</td>
</tr>
<tr>
<td>115</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The series studied</td>
</tr>
<tr>
<td>117</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Results</td>
</tr>
<tr>
<td>117</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discussion</td>
</tr>
<tr>
<td>124</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
</tr>
<tr>
<td>127</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summary</td>
</tr>
<tr>
<td>127</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page</th>
<th>5 - Slow therapeutic response (retrospective phase)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Introduction</td>
</tr>
<tr>
<td>129</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The series studied</td>
</tr>
<tr>
<td>131</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Results</td>
</tr>
<tr>
<td>132</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discussion</td>
</tr>
<tr>
<td>139</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
</tr>
<tr>
<td>141</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summary</td>
</tr>
<tr>
<td>142</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page</th>
<th>6 - Relapse (retrospective phase)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Introduction</td>
</tr>
<tr>
<td>143</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The series studied</td>
</tr>
<tr>
<td>144</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Results</td>
</tr>
<tr>
<td>145</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overlearning therapy</td>
</tr>
<tr>
<td>151</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discussion</td>
</tr>
<tr>
<td>155</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summary</td>
</tr>
<tr>
<td>156</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page</th>
<th>7 - Parental explanations of non-attendance and termination (concurrent phase)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Introduction</td>
</tr>
<tr>
<td>158</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method of investigation</td>
</tr>
<tr>
<td>158</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-attendance</td>
</tr>
<tr>
<td>158</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remission of enuresis</td>
</tr>
<tr>
<td>161</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Termination</td>
</tr>
<tr>
<td>163</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discussion</td>
</tr>
<tr>
<td>166</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summary</td>
</tr>
<tr>
<td>167</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page</th>
<th>8 - Expectancies and therapeutic outcome (concurrent phase)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Introduction</td>
</tr>
<tr>
<td>168</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method of investigation</td>
</tr>
<tr>
<td>171</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Results</td>
</tr>
<tr>
<td>174</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discussion</td>
</tr>
<tr>
<td>176</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summary</td>
</tr>
<tr>
<td>178</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page</th>
<th>9 - Anxiety and therapeutic outcome (concurrent phase)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Introduction</td>
</tr>
<tr>
<td>180</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method of investigation</td>
</tr>
<tr>
<td>180</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Results</td>
</tr>
<tr>
<td>182</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discussion</td>
</tr>
<tr>
<td>183</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summary</td>
</tr>
<tr>
<td>185</td>
<td></td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Percentage incidence of nocturnal enuresis among 5,386 children</td>
</tr>
<tr>
<td></td>
<td>(Blomfield and Douglas, 1956; Douglas, 1971)</td>
</tr>
<tr>
<td>2</td>
<td>Percentage incidence of nocturnal enuresis among Lancashire children</td>
</tr>
<tr>
<td></td>
<td>(Stein and Susser, 1967)</td>
</tr>
<tr>
<td>3</td>
<td>Reported results of conditioning treatment</td>
</tr>
<tr>
<td>4</td>
<td>Cases excluded from analysis (retrospective phase)</td>
</tr>
<tr>
<td>5</td>
<td>Outcome for cases accepting referral during 1969</td>
</tr>
<tr>
<td>6</td>
<td>Sources of referral during 1969 (excluding two cases referred for treatment</td>
</tr>
<tr>
<td></td>
<td>of encopresis only)</td>
</tr>
<tr>
<td>7</td>
<td>Distribution of patients entering treatment by social class</td>
</tr>
<tr>
<td>8</td>
<td>Distribution of wetting frequencies</td>
</tr>
<tr>
<td>9</td>
<td>Types of previous treatment reported for retrospective phase patients</td>
</tr>
<tr>
<td>10</td>
<td>Source of previous treatment reported for retrospective phase patients</td>
</tr>
<tr>
<td>11</td>
<td>Alternative forms of treatment to the enuresis alarm</td>
</tr>
<tr>
<td>12</td>
<td>Use of drugs for retrospective phase patients</td>
</tr>
<tr>
<td>13</td>
<td>Termination and family size</td>
</tr>
<tr>
<td>14</td>
<td>Termination in relation to appointments given</td>
</tr>
<tr>
<td>15</td>
<td>Follow-up periods (retrospective phase)</td>
</tr>
<tr>
<td>16</td>
<td>Parental explanations of non-attendance</td>
</tr>
<tr>
<td>17</td>
<td>Parental explanations of termination</td>
</tr>
<tr>
<td>18</td>
<td>Age and CE score</td>
</tr>
<tr>
<td>19</td>
<td>Social class and PIS score</td>
</tr>
<tr>
<td>20</td>
<td>Social class and NV score</td>
</tr>
<tr>
<td>21</td>
<td>Intercorrelations of attitude and CMAS scores</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>The theoretical relationship of drive strength and performance at three levels of task complexity (adapted from Lader and Marks (1971))</td>
</tr>
<tr>
<td>2</td>
<td>The enuresis alarm apparatus</td>
</tr>
<tr>
<td>3</td>
<td>A classical paradigm for the conditioning treatment of enuresis</td>
</tr>
<tr>
<td>4</td>
<td>Distribution of referrals by age</td>
</tr>
<tr>
<td>5</td>
<td>Duration of clinic contact for terminating patients</td>
</tr>
<tr>
<td>6</td>
<td>Distribution of treatment duration</td>
</tr>
</tbody>
</table>
INTRODUCTION

Nocturnal enuresis is a widespread and embarrassing disorder of childhood, wherein behavioural treatment has achieved a high degree of success (Young, 1965b; Turner, Young and Rachman, 1970). Nevertheless, there remain serious shortcomings in the treatment of patients in a clinical setting: at the clinic in which the present study was conducted, four major areas of therapeutic failure were identified for investigation. These were the common problems of patient non-attendance for the commencement of treatment, the termination of treatment through patient withdrawal, the slow response to treatment of a recalcitrant minority of patients and the relapse of an appreciable proportion of patients achieving initial arrest of enuresis.

Enuresis is a major developmental disorder, in which the sufferer is deficient in a specific area of behaviour, and constitutes a situation in which the techniques of behaviour therapy are frequently employed in the therapeutic establishment of a new pattern of response. Consideration of therapeutic failure in the treatment of childhood enuresis at a behaviourally oriented clinic may be of importance, both from the aspect of the treatment of developmental disorders, and in relation to the employment in a field setting of techniques derived from learning theory to establish acceptable behaviours in the deficit disorders.

Study of the factors associated with therapeutic failure as it occurs in a practical clinic setting is also of importance in any attempt to maximise the impact of treatment. It may also afford further understanding of those components of the context of treatment which might relate to the continuation or breakdown of successful therapeutic collaboration between the clinic team,
the parents, and the child patient. Knowledge of the correlates of therapeutic failure may further be of advantage in considering the effective deployment of limited therapeutic resources.

Throughout the study, the word "enuresis" refers to childhood enuresis nocturna unless otherwise indicated.
1. THE PROBLEM OF ENURESIS

Definitions

Bedwetting, or enuresis nocturna, fundamentally represents either a persistence of, or a reversion to, the nocturnal urinary incontinence of infancy. Since children exhibit wide individual differences in the speed with which they acquire full urinary control, the assertion of a chronological age at which a child "ought" to be dry and after which continued wetting becomes "enuresis," is somewhat arbitrary. A child who regularly wets the bed at fifteen would naturally be regarded as abnormal in this respect, but not so a child of two. Workers in the field have suggested various chronological boundaries between individual differences and abnormality in the speed of acquisition of urinary continence. Many regard three as the age at which a child should be dry at night (Mowrer and Mowrer, 1938; Crosby, 1950; Seiger, 1952; Young, 1969); others place the boundary at two (Bakwin and Bakwin, 1942), four (Hallgren, 1957), or five years (Michaels, 1938; Behrle, Elkin and Laybourne, 1956). Gairdner (1965) advises that treatment need not be sought for children under seven or eight years of age. Among the authors who acknowledge in their definitions the wholly arbitrary nature of the age criterion are Stein and Susser (1967) and Meadow (1970), who define enuresis as bedwetting persisting beyond any "expected" age for its cessation. Muehllner (1960) specifies the period between the ages of two and four and a half years as the range during which wetting should be expected to cease. Further differentiation may be made between the arbitrarily selected age at which infantile incontinence may be considered to become the disorder of enuresis, and the age at which it is considered appropriate that treatment should be
offered: perhaps it would be reasonable to conclude that infantile incontinence becomes enuresis whenever the wetting is regarded by parent or child as inappropriate or problematical, and that the offer of treatment becomes appropriate once parent or child desires relief from enuresis.

Many young children suffer occasional lapses from continence, and thus a further arbitrary boundary is required to delineate true enuresis from "the occasional accident". The range of minimum wetting frequencies which have been regarded as constituting enuresis is wide; Tapia, Jekel and Domke (1960), in an epidemiological study, utilised a minimum frequency of one wet bed per month, while in a clinical trial Lovibond (1963b) employed a criterion of at least five wet nights within a week. In addition to satisfying a criterion of minimum frequency, wetting should be persistent and regular to constitute enuresis (Hallgren, 1957; Turner, Young and Rachman, 1970).

Some writers differentiate from the "true" enuretic a group of "factitious" wetters, whose incontinence is conscious or voluntary and does not occur during sleep, resulting from spite, the desire for attention, very low household standards, inaccessibility of a toilet or pot, or fear of the dark (Bakwin and Bakwin, 1942; Crosby, 1950; Hallgren, 1957; Young, 1969; Lovibond and Coote, 1970). Such differentiation would seem reasonable, although the incidence of factitious wetting is almost certainly far lower than would be indicated by the high proportion of resentful mothers who ascribe the disorder to "laziness" alone. Ellison Nash (1949), Seiger (1950) and Hallgren (1957) further exclude from their definitions of enuresis those cases
attributable to organic lesion, although the full aetiological significance of such lesion remains ill-defined.

In order to maintain adequacy of definition together with recognition of the arbitrary nature of many definitive criteria, enuresis nocturna may be satisfactorily defined as persistent and frequent urination during sleep at an age at which nocturnal bladder control is considered to be normal.

Apart from phenomenological classification, and the possible aetiological distinction between enuresis with and without organic complications, further categorization may be made according to the history of the disorder. A child who has lost nocturnal urinary control following an appreciable period of dryness is considered to suffer from "secondary" enuresis, occasionally labelled "onset" or "acquired" enuresis (Hallgren, 1957). In the present study, a child was regarded as a secondary enuretic if his wetting recurred following at least one year of dryness after the age of three years. A child who has never acquired full nocturnal urinary control is termed a "primary" enuretic.

**Incidence and epidemiology**

**Incidence:** In terms of incidence, enuresis must be regarded as among the most widespread of childhood disorders. The high incidence of the problem was dramatically underlined during the second world war, when the need for special billeting for large numbers of enuretic evacuees became apparent (Gill, 1940). Jones (1960b) has pointed out that enuresis represents a developmental disorder inasmuch as nocturnal urinary continence has not been acquired as is deemed to be chronologically appropriate. No child is born continent, thus the incidence of enuresis at birth may be regarded as one hundred per cent. This figure falls to two
per cent or less by the age of 15, the declining age/incidence curve showing no sharp fall at puberty, as is sometimes hypothesized.

Although the literature relating to the incidence of enuresis in the population is substantial, variations in definition of the disorder render interstudy comparisons difficult. Blomfield and Douglas (1956) have investigated the incidence of enuresis in a cohort of 5,386 British children born during the first week of March, 1946. These authors estimate that in 1956 a total of \( \frac{3}{3} \) million British children aged between \( \frac{4}{4} \) and \( \frac{7}{4} \) were enuretic.

![Table 1](https://example.com/table.png)

Table 1: Percentage incidence of nocturnal enuresis among 5,386 children (Blomfield and Douglas, 1956; Douglas, 1971)

Table one presents the percentage incidence of enuresis reported by Blomfield and Douglas (1956) and Douglas (1971). In a large-scale survey conducted in Buckinghamshire, Shepherd, Oppenheim and Mitchell (1971) found five per cent of boys and three per cent of girls aged from five to fifteen to be wet at least once each fortnight; eleven per cent of boys and eight per cent of girls being wet more than once per year. Two per cent of boys and one per cent of girls were wet every night. In a sample of four year old children in Nottingham, Newson and Newson (1970) have reported an incidence of nocturnal enuresis of 19 per cent (having one or more wet beds per week). Kellmer-Pringle, Butler
and Davie (1966) found that 12.1 per cent of boys and 9.7 per cent of girls among their sample of 7,985 children were wet after the age of five years. It can generally be assumed that among five year old children, from ten to fifteen per cent may be expected to be enuretic (Meadow, 1970), while by puberty this figure will have fallen to approximately one per cent (Jones, 1960b; Gairdner, 1965). De Jonge (1971b), in an epidemiological study of 10,000 children in Holland, has calculated the spontaneous remission rate for enuresis to be 59 per cent between the ages of 6½ and 12 years (47 per cent for boys and 71 per cent for girls). The probability of any child in this age range achieving bladder control within one year was estimated as 15 per cent.

Incidence figures obtained for samples of Lancashire children by Stein and Susser (1967) are given in table two. These figures are indicative of a steeper decline in incidence with increasing age than is generally reported in British studies, although caution should be exercised in the interpretation of incidence figures because of the variability of definition between studies. The study by Stein and Susser may be instanced as one of the many investigations in which the definition of enuresis employed, in terms of minimum wetting frequency, is not stated. The marked effect that variations in definition can exert upon incidence figures is well illustrated by the findings of a recent study conducted in the Isle of Wight (Rutter, Tizard and Whitmore, 1970), in which 2.6 per cent of boys and 1.9 per cent of girls were enuretic...
aged ten and eleven were reported to wet their beds or pants regularly at least once each week, while 4.3 per cent of boys and 2.4 per cent of girls wet their beds or pants at least once per month.

**Sex differences:** Table one demonstrates the almost universally reported predominance of boys among the enuretic population (Davidson and Douglas, 1950; Blomfield and Douglas, 1956; Hallgren, 1957; Bakwin, 1961; Kellmer-Pringle, Butler and Davie, 1966; Douglas and Blomfield, 1967; Meadow, 1970; Rutter, Tizard and Whitmore, 1970; Douglas, 1971; Shepherd, Oppenheim and Mitchell, 1971; Davie, Butler and Goldstein, 1972). Boys would thus seem to be less efficient than girls in the acquisition of full bladder control by means of normally operative processes. The literature yields no conclusive explanation of this sex bias, although White (1968) refers to the greater length of the male urethra, and Stein and Susser (1967) point to the greater rate of physiological maturation of girls during early childhood, suggesting that physical maturation may set the pace for sphincter control. Differential parental expectations relating to standards of cleanliness between boys and girls may also be implicated.

Consideration of the sex bias in the incidence of enuresis in terms of sex differences in maturational rate may generate the hypothesis that boys may attain the requisite level of physiological maturity for bladder control later than girls. Boys might then subsequently require similar exposure to training influences, the age of cessation of primary enuresis thus being expected to occur later among boys than girls. Hallgren (1957) has indeed reported such a tendency, although other explanations of this phenomenon are tenable. MacKeith (1972) has questioned the concept of
"developmental delay" in enuresis, regarding it as a descriptive rather than aetiological postulate; furthermore, a simple postulate relying upon early physiological immaturity among boys cannot explain the sex bias in the incidence of secondary enuresis (1). Nocturnal enuresis shares a pattern of incidence, including a sex bias, common to many childhood disorders although Rutter, Tizard and Whitmore (1970) have reported that diurnal enuresis is as prevalent among girls as boys.

An interesting hypothesis regarding the susceptibility of boys to enuresis has recently been presented by Peterson (1971). Postulating a punishment training situation in the normal acquisition of bladder control, based upon the aversiveness of the wet state, Peterson suggests that since males have a higher threshold for tactile stimuli than do females, the normal training situation may be considered less effective for boys than girls.

**Social class**: A strong socioeconomic bias is commonly reported in the incidence of enuresis, the predominance being among the lower social classes (Blomfield and Douglas, 1956; Bakwin, 1961; Douglas and Blomfield, 1967; Stein and Susser, 1967; Meadow, 1970; Yates, 1970; Kolvin et al., 1971; Davie, Butler and Goldstein, 1972). This social class bias in incidence appears more pronounced among the older age groups (Blomfield and Douglas, 1956; Stein and Susser, 1967). It would further seem to be related to sex differences, since the incidence of female enuretics has been found to be disproportionately high among the families of manual workers, while the proportion of enuretic boys is virtually

---

(1) In the series of patients constituting the retrospective phase of the present study, boys outnumbered girls by approximately two to one. This ratio was found to hold true for both primary and secondary enuretics.
constant throughout the socioeconomic scale (Blomfield and Douglas, 1956; Douglas and Blomfield 1967; Douglas, 1971). The precise nature of the relationship between sex and socioeconomic factors is however not known.

There may well be a socioeconomic bias in the readiness of parents to report the problem of enuresis; Yates (1970) notes that parents of higher socioeconomic status may tend to refer their children, or to accept referral, for treatment of less severe disorders and at earlier ages, than parents of lower socioeconomic status. Socioeconomic biases in attitudes may thus seriously affect the apparent incidence of enuresis, explaining at least in part the common failure of populations of treated enuretics to reflect the social class bias exhibited in the incidence figures, tending instead towards over-representation of middle-class children\(^{(1)}\). Similarly, attitudinal biases affecting readiness to report enuresis may contribute towards the low reported referral rates of Jewish enuretics (Michaels and Goodwin, 1934; Bakwin, 1961), possibly either emphasizing or clouding the true incidence figures for this minority group.

The predominance of enuresis among the lower socioeconomic classes may be due to the increased proportion of poorly housed families, and families having low standards of child rearing to be found among these groups; Bakwin (1961) regards low standards and cold homes, often with inaccessible toilets, as conducive to

\(^{(1)}\) Patients at the special investigation clinic in which the present study was conducted were found to be distributed around the modal class of III - manual (see chapter two).
enuresis. Newson and Newson (1968), however, failed to discover an association between housing conditions and enuresis. Furthermore, poor housing conditions cannot explain the predominance of enuretic girls among the lower socioeconomic strata (Blomfield and Douglas, 1956; Douglas and Blomfield, 1967; Douglas, 1971). Explanation of the social class bias in terms of class-dependant parental attitudes and expectations regarding the acquisition of continence may be valid but remains unacceptably vague and in need of systematic investigation. All that can presently be educed from the facts is that conditions prevalent in the lower social strata appear related to failures in the acquisition of urinary continence, and that these conditions seem particularly to affect girls.

Stein and Susser (1967), concluded from a transatlantic comparison of urinary continence that the sequence for the acquisition of bladder control is malleable, regularities stemming from physical maturation being often overridden by patterns imposed by external societal forces. These authors provide an elegant model of the increase in the socioeconomic bias in the incidence of enuresis as a function of age. Primary enuretics are described as survivors from a total enuretic population whose incidence is one hundred per cent at birth. This population undergoes its highest loss at the highest socioeconomic levels, resulting in an increasing concentration of enuretic survivors, as age increases, among the lowest social classes. Enuretics aged ten and older were found to be characterized, unlike those of five by maternal inadequacies and familial disorganization; persistence of enuresis into the teens
was found in association with more extreme family pathologies. It is worthy of note that Stein and Susser found children living in residential establishments to be particularly prone to enuresis. Although descriptively useful, the relationship between the social class divergence in incidence with age and the implication of family pathology in the persistence of enuresis, is correlational and does not permit the conclusion that the incidence of enuresis merely reflects a socioeconomic bias in the incidence and severity of family pathology. Whether this is the explanation of the social class bias in the incidence of enuresis, and whether girls are more prone to react to the familial disruptions which relate to the incidence of enuresis, thus explaining their predominance among enuretics from the lowest socioeconomic classes, must thus remain open questions.

**Type of enuresis:** In the retrospective phase of the present study, 86.3 per cent of cases were primary enuretics. This figure is in close agreement with Hallgren's (1956a) report that 86 per cent of his sample of nocturnal enuretics from Stockholm schools were primary enuretics; the period of continence required before a relapse to wetting would be regarded as secondary enuresis was one year in both studies. Hallgren reported 89 per cent of his sample of diurnal enuretics to be primary cases. The same investigator has reported the similar figure of 85 per cent for the incidence of primary enuresis among a clinical series of enuretic outpatients at Stockholm hospitals (Hallgren, 1957). Hallgren (1957) further noted a higher wetting frequency among primary than among secondary enuretics, 85 per cent of the former group wetting once or more every night. According to figures reported by Crosby (1950)
the incidence of secondary enuresis rises to a peak of approximately six per cent of children aged five, while the proportion of secondary enuretics aged over fifteen is virtually negligible. Care must, however, be exercised in the assessment of the incidence of secondary enuresis, owing to interstudy variations in definition; Meadow (1970) for instance reports the strange finding that the incidence of secondary enuresis is higher than that of primary enuresis among children aged over six years. Since no formal definition of secondary enuresis is provided by either Crosby or Meadow, one must assume that the wide difference between the incidence rates they report to be due to a fundamental disagreement over their respective criteria for a diagnosis of secondary enuresis.

Familial variables: In considering a childhood disorder, it is of value to investigate the possibility of a relationship between morbidity rate and both family size and ordinal family position. The relevant evidence relating to enuresis is confused and permits no clear conclusion to be drawn. Michaels and Goodman (1934) found family position to be negligible with the single exception of only boys, but these authors are contradicted by Dimson's (1959) report that second children in families of three children or more are particularly prone to enuresis. Dimson, however, reports no greater incidence among first-born children when compared with second-born children, while Meadow (1970) regards enuresis as commoner among the first-born. Dimson has also noted that the proportion of male enuretics appears to be lower among larger families. Hallgren (1956b) and De Jonge (1971b) have found no relationship to exist between enuresis and either family size or ordinal position.
Family history: Many investigators have reported a high incidence of past or current enuresis among the families of child enuretics (Hubert, 1933; Foulten and Hinden, 1953; Blomfield and Douglas, 1956; Hallgren, 1957; Wickes, 1958; Bakwin, 1961; Barbour et al., 1963; Young, 1963; British Medical Journal, 1969; Kolvin et al., 1971). Data concerning the familial incidence of enuresis are particularly susceptible to inaccurate and false reporting by parents; Hallgren (1957) has pointed out that some uncontrolled studies have reported levels of familial incidence lower than the morbidity rate for the general population. Few studies have involved a control procedure, and even in controlled studies it is doubtful whether the parents of non-enuretic control subjects share with the parents of known enuretics the same readiness to report the enuresis of other members of the family.

The percentage incidence of enuresis among the families of propositi has been variously estimated, much of the variation between estimates being dependent upon the relationships included in the term "family". Wickes (1958) found a positive family history for 47 from a total of 100 cases, a further 28 having knowledge of enuresis in distant relatives. Hubert (1933), in a controlled study of 50 enuretics, obtained histories of familial incidence in 40 per cent of his enuretic subjects and in 14 per cent of their non-enuretic controls. Blomfield and Douglas (1956) reported that 10.6 per cent of the siblings of severe enuretics were wet, compared with 5.1 per cent of the siblings of dry children. Hallgren (1957), recognizing that his series of hospital outpatients was not fully comparable with the enuretic population as a whole, reported a significantly higher
morbidity rate among the families of enuretics than among the general population. For the fathers and brothers of his enuretic patients the reported incidence of past or current enuresis was 30 per cent against an expected 12 per cent, and for mothers and sisters 18 per cent against an expected 8 per cent. No significant differences were found between the incidence among parental siblings and grandparents of propositi and the morbidity rate of the general population. The incidence of enuresis was found to be higher in the nuclear families of primary rather than secondary enuretics, although the trend failed to reach significance for the siblings of patients; a similar trend has been noted by other investigators (Poulten and Hinden, 1953; Young, 1963a; Young and Turner, 1972).

Bakwin (1961), questioning parents specially selected for cooperation, has reported an incidence of 62 per cent among the parents, and 40 per cent among the siblings of enuretic children. Among the families of patients at a special investigation clinic, Young (1963a) obtained a positive history in 47.5 per cent of his series, including parental siblings, cousins and grandparents in his definition of "family"; this figure compared with a 25.4 per cent incidence among the families of control subjects. A positive history of enuresis was reported in respect of 45 per cent of the mothers and 31 per cent
of the fathers of Young's patients\(^{(1)}\). Crosby (1950) dismisses the assumption of a familial tendency, together with theories of inherited predisposition, noting that the incidence of 17.8 per cent of parents who were enuretic at five years, and of 19.8 per cent among the siblings of his 73 patients is no higher than that assumed for the general population. His figures, however, seem low by comparison with those obtained at other clinics. It must also be borne in mind that clinic patients constitute an unrepresentative group with regard to the total enuretic population.

It is often reported that there is a greater frequency of primary enuresis among both of identical twins than in both of fraternal twins, suggesting a genetic factor (Young, 1963a; Meadow, 1970). Shields (1954) has given evidence concerning the possibility of a genetic factor in enuresis, finding that among six pairs of uniovular twins, in only two pairs were the twins

\(^{(1)}\) In the retrospectively studied series of the present study, conducted in a comparable special investigation clinic, 21.4 per cent of the mothers of patients and 11.6 per cent of fathers are known to have been enuretic. One or both parents were found to have suffered from enuresis in 28.9 per cent of all cases, a figure in closer agreement with that of 29.4 per cent reported by Bicknell (1959) than with that of 50 per cent reported by Young (1963a). However, 67.7 per cent of patients studied in the retrospective phase are known to have at least one affected parent or sibling; this figure is considerably higher than the 47.5 per cent reported by Young, who included more distant relatives than those constituting the nuclear family.
discordant for enuresis; in the other four the children were either both dry or both wet. Among the 26 biovular pairs studied, however, one but not the other twin was wet in all 10 pairs in which enuresis occurred. It would seem reasonable to accept the possibility of an innate, genetically determined, predisposition to difficulty in the acquisition of micturitional control, and possibly also an innate sensitivity of the mechanisms of control to disruption by environmental influences. Any genetically determined factors may, however, be both mediated and modified by environmental influences, and child rearing attitudes and practices may also contribute to the reported familial tendency. Although the respective contributions of interactive genetic and environmental factors cannot be accurately identified, members of certain family groups do share an innate or acquired predisposition towards enuresis.

Diurnal disturbances of micturition: A strong coincidence of nocturnal enuresis with other disorders of micturition would seem from the relevant literature to be well established. Hallgren (1957) and Bakwin (1961) have reported the relationship of urgency and frequency of micturition, possibly accompanied by daytime "dribbling" or diurnal enuresis, with nocturnal enuresis. In addition, Hallgren (1956a) has reported a significant association of urinary frequency with enuresis, and De Jonge (1971b) has noted a highly significant association of enuresis with diurnal urgency of micturition. Bakwin (1961) has observed that approximately 10 per cent of nocturnal enuretics are also wet by day, while Young (1965a) has reported the much higher figure of
49 per cent of nocturnal enuretics to be wet by day.\(^{(1)}\)

Diurnal enuresis rarely occurs other than as an accompaniment to nocturnal enuresis (Hallgren, 1957; Bakwin, 1961; Rutter, Tizard and Whitmore, 1970; De Jonge, 1971b); of all children suffering from urinary incontinence, approximately 90 per cent are wet by night (Hallgren, 1956a; 1957; Rutter, Tizard and Whitmore, 1970).

Considering the distribution of diurnal enuresis by sex, Blomfield and Douglas (1956) have reported that 37 of their cohort of 5,386 children were diurnally enuretic in the absence of nocturnal symptoms, and that 30 of this group were girls. These investigators found a significantly higher proportion of girls than boys to be wet by day, irrespective of the presence of nocturnal enuresis; in a later study by Rutter, Tizard and Whitmore (1970), the incidence of diurnal enuresis was found to be comparable between the sexes. A similar absence of male predominance among diurnal enuretics was recorded by Hallgren (1956a), who concluded that no sex difference is present in the morbidity risk of diurnal enuresis; in a subsequent clinical study (Hallgren, 1957), the same investigator observed that secondary diurnal enuresis occurred significantly more frequently among girls than boys. It would appear, therefore, that the predominance of boys among enuretics disappears, or is

\(^{(1)}\)In the retrospectively studied series of the present investigation, diurnal enuresis was found to accompany nocturnal enuresis in 11.2 per cent of a series of 178 children. This figure is in close agreement with that of 10 per cent reported by Bakwin (1961).
even reversed, when diurnal rather than nocturnal enuresis is considered. There is available at present no adequate explanation of this phenomenon, although it might be postulated that boys are particularly receptive to whatever mechanisms operate during the daytime to build up urinary control, and girls to whatever mechanisms may be operative at night. It would not be reasonable to conclude that since the addition of diurnal wetting to nocturnal enuresis may constitute a more severe degree of disruption to urinary control, that more boys may exhibit a lesser degree of disruption in being wet by night alone, while a smaller number of girls exhibit a greater degree of disruption in urinary function, since it is among those exhibiting diurnal symptoms in isolation that the greatest predominance of girls occurs (Blomfield and Douglas, 1956).

In the majority of cases, however, diurnal enuresis would seem to represent a greater degree of disruption of urinary control than does nocturnal enuresis alone — although as has been implied, such a formulation cannot apply to every case. The findings of Hallgren (1956b; 1957) and Rutter, Tizard and Whitmore (1970) that diurnal wetting occurs more frequently among enuretics who also exhibit a greater level of psychiatric disturbance lends tentative support to the suggestion that such cases might represent a more extreme form of eliminative disturbance than nocturnal enuresis alone. As might be predicted, diurnal enuresis tends to disappear upon successful treatment of nocturnal wetting (Gillison and Skinner, 1958; Young, 1965a; Lovibond and Coope, 1970; Dische, 1971), indicating a common basis in many cases.
In the series of 178 enuretic children constituting the retrospectively studied series of the present investigation, abnormal urgency of micturition was found to accompany nocturnal enuresis in 33.1 per cent of cases, and abnormal frequency of micturition to occur in 29.2 per cent of cases. Hallgren (1956a), in his epidemiological study, found diurnal frequency of micturition to occur in 35 per cent of cases with diurnal enuresis and in 18 per cent of cases with nocturnal enuresis alone, there being no sex difference. Problems of urgency and frequency of micturition may be logically implicated in poor control over the automatic voiding of urine (Yeates, 1971).

Encopresis: The incidence of encopresis (incontinence of faeces) among enuretics has been found to be higher than among children having normal urinary continence (Rutter, Tizard and Whitmore, 1970; De Jonge, 1971b). Rutter, Tizard and Whitmore (1970) report that approximately one in eight of the enuretics in their sample were also encopretic. In an early study of Stockholm elementary school children, Hallgren (1956a), however, had not found the incidence of encopresis to be significantly higher among nocturnal enuretics than among their non-enuretic controls, although reporting a significant association between encopresis and diurnal enuresis. In Hallgren's later study of hospital patients (Hallgren, 1957), the incidence of encopresis among enuretics was found to be significantly higher than that among the general population only where it occurred in conjunction with urinary dribbling or diurnal enuresis. A statistically significant sex difference was reported in the incidence of encopresis in this latter study, the high figure of 23 per cent
of boys and 11 per cent of girls being affected.\(^{(1)}\)

It is possible that failure to acquire or maintain appropriate bowel control may frequently be attributable to factors also implicated in poor urinary control. It should be stated, however, that enuresis and encopresis are not physiologically analogous states. Enuresis represents failure to inhibit the bladder-voiding response until such occasion as is appropriate, while encopresis\(^{(2)}\) frequently involves the prolonged retention of faecal matter through "colonic inertia" (Coekin and Gairdner, 1960), producing an "overflow" situation in which proctoscopic examination may reveal a dilated sphincter and a rectum charged with impacted faeces (Coekin and Gairdner, 1960; Neale, 1963; Gairdner, 1965). The skill required by the enuretic is the successful postponement of micturition; for the encopretic, it is often the encouragement of defaecation to restore the

\(^{(1)}\) In the retrospectively studied series of the present investigation encopresis occurred in conjunction with enuresis in 7.3 per cent of all cases. In only 2.25 per cent of all cases did encopresis occur without accompanying diurnal enuresis, or urgency or frequency of micturition. Referral biases may, however, be relevant, since the clinic was known locally as primarily an enuresis clinic.

\(^{(2)}\) The term "encopresis" is here used to signify faecal incontinence, without the limitation to non-mechanical, supposedly psychogenic incontinence suggested by Coekin and Gairdner (1960).
physiologically normal state of emptiness of the rectum.

Additional disorders: The relationship of enuresis to forms of developmental disorder such as delayed speech development and an electroencephalographic pattern described as "immature" has been noted by Rutter, Tizard and Whitmore (1970). There seems, however, to be no significant relationship between enuresis and numerous other physiological factors, such as convulsions or neurological disorders, physical disorders, birth weight, complicated delivery, eczemas, or "funnel chest" (Hallgren, 1956b; 1957). Hallgren also failed to discover any significant relationship between enuresis and asthma, although Rutter, Tizard and Whitmore (1970) subsequently reported a significant relationship between these two disorders.

Organic factors: It is generally recognized that a small percentage of child enuretics present an organic lesion of possible aetiological significance; Geppert (1953) and Yates (1970) have estimated the incidence to be as high as ten per cent, while, writing earlier, Mowrer and Mowrer (1938) regarded five per cent as a reasonable consensus of contemporary opinion. Although Ellison Nash (1949), Seiger (1952) and Hallgren (1956a; 1957) go so far as to exclude from their definition of enuresis those cases apparently attributable to organic pathology, many writers reviewing the relevant evidence have concluded that structural abnormalities, even when present, are unlikely to constitute a primary cause of enuresis (Barbour et al., 1963; Young, 1969, Meadow, 1970). In a large scale epidemiological study, Hallgren (1956b) could find no organic lesion which could justifiably be considered as directly causative of enuresis.
Barbour et al (1963) question the aetiological significance of a high incidence of bladder neck abnormality among enuretics, regarding it as equally reasonable to view such abnormality as a sequel to incontinence rather than its cause.

Ellison Nash (1949) discovered some degree of urinary tract lesion, of a primary or secondary nature, in some 30 per cent of his own enuretic patients, while Starfield (1972) has reported genitourinary abnormality in only 3.9 per cent of her series of 256 nocturnal enuretics. In a Copenhagen children's hospital, Andersen and Petersen (1971) diagnosed urinary tract malformations or recurrent infection of the urinary tract in six per cent of their patients, mainly girls, later bladder maturation in 41 per cent (mainly boys suffering from primary enuresis and often also diurnal enuresis), and small bladders in 10 per cent (mainly girls). Muellner (1960b) reports primary enuretics to possess small bladders with a low absolute volumetric capacity, and concludes that lack of normal bladder development is due to inadequate use of the voluntary mechanisms of micturition.

According to this view, the small bladder is a secondary cause of primary enuresis, and is itself the result of a functional inadequacy (Yeates, 1971). This implication of low absolute bladder capacity in enuresis, although deriving from cystometric studies, is however to some extent undermined by the finding that pressure applied to the perineal region of patients suffering from the "irritable bladder" syndrome (i.e. nocturnal enuresis complicated by diurnal urgency or frequency of micturition, or by daytime wetting) affords a dramatic increase in functional capacity, presumably by counteracting a weakness of the perineal
floor musculature, indicating that the bladder is functionally but not anatomically small in size (Vincent, 1964); this latter conclusion is supported by subsequent studies (Esperanca and Gerrard, 1969; Gerrard and Zaleski, 1969). Enuresis may therefore be a functional disorder, whether or not its effect is mediated by structural deficiencies in bladder size.

Broughton (1968) has presented evidence that differences in bladder physiology between enuretic and non-enuretic children may exist throughout sleep, the enuretic exhibiting great spontaneous increases in intravesical pressure which constitute the "enuretic episode" when they reach a clinically overt level. This evidence requires recognition of the possibility that enuresis may follow from physiological abnormalities of bladder function which predispose certain individuals to the enhancement of these abnormalities on some nights to culminate in wetting.

The popular theory that enuresis in boys is related to the state of the foreskin has been discredited by Cust (1958), who found no predominance of boys with coronal adhesions, or who had been circumcised, among enuretics.

Some urologists seem particularly predisposed to implicate genitourinary lesion in the aetiology of enuresis, and recommend the somewhat unpleasant procedure of cysto-urethrography as a routine investigation. Such investigators report high incidences of numerous lesions, including stenotic meatus, distal urethral stenosis, urethral valves, urethritis, vulvovaginitis, hypotonic urethra, neurogenic disorders of the bladder, wide bladder neck, hypertrophy of the vesical neck, ureteral reflux, and various forms of distal urethral obstruction. Arnold (1964, 1968, 1970)
recorded an 87 per cent incidence of lower urinary tract obstruction among 300 enuretics with accompanying diurnal symptoms, and Fisher and Forsythe (1954) discovered urinary tract abnormalities in 41 boys and 20 girls from a total series of 135 patients by the process of micturating cysto-urethrography. Arnold claims a reduction in wetting in 63 per cent of cases by correction of urinary tract obstruction. Hallgren (1957) found no relation between enuresis and any urinary tract disorders other than pyloric stenosis in males.

In the absence of controlled studies, such figures are difficult to interpret; as Gairdner (1970) comments, radiologically discovered urinary tract abnormalities are present in many children who nevertheless become dry. It also appears that bladder neck abnormalities do not militate against spontaneous remission of enuresis (Barbour et al., 1963). In a study of 219 girls with urinary tract infection, Kuzemko (1967) found only 42 cases of nocturnal or diurnal enuresis; of 32 children investigated by pyelography, urinary tract abnormality was discovered in only eight. Gairdner (1970) offers sound advice against inflating the significance of potential "red herrings".

It is likely that in some cases, genitourinary lesion may contribute to enuresis by increasing the difficulty of learning bladder control, but it seems unlikely, in view of the success of treatments which assume normality of the urinary tract, that the contribution is more than minor in the majority of cases. Sampling biases between different investigators (such as urologists and pediatricians) may well contribute much to the marked differences between reported incidence rates of urinary
lesion among enuretics. In a very few cases, prolonged recalcitrance to treatment may indicate the present of an abnormality perhaps rendering full urinary control beyond the child's capacity. It would seem advisable that all patients should undergo simple screening procedures for urinary pathology, lack of therapeutic response indicating further investigation (Forsythe and Redmond, 1970). Such further investigation may involve cysto-urethrography or intravenous pyelography; because of the possible high incidence of minor genitourinary abnormality in the general population, such investigations would appear only marginally informative and certainly disturbing in cases making a satisfactory therapeutic response.

The physiology of micturition

The following accounts of normal human micturition and the acquisition of micturitional control are derived from accounts by Bakwin and Bakwin (1942), Jones (1960), Muellner (1960b), Vincent (1964), Yates (1970) and Yeates (1971).

The urinary system in man comprises a pair of kidneys, the ureters, the bladder and the urethra. The waste products of cellular metabolism, in the form of urea, are extracted from the blood system by the kidneys. Urine then passes from the kidneys to the bladder, where it is stored between periodic voidings, via the ureters. The urethra leads from the bladder to the exterior. The ureters, which transfer urine by peristaltic action, enter the bladder at an oblique angle such that when the bladder wall is either stretched by the pressure of urine or contracted by muscular action, the slight extensions of the ureters into the vesical cavity are compressed to form a functional valve,
preventing backflow of urine. The bladder itself is a near-spherical sac, whose muscular wall consists of three layers of smooth (involuntary) muscle fibres, forming the detrusor muscle. The urethra, through which urine is discharged to the exterior in micturition, has smooth muscle fibres in the walls of its proximal portion, condensing at the bladder orifice to form the internal sphincter which when contracted prevents the escape of urine from the bladder. In males, an additional sphincter of striated (voluntary) muscle encircles the distal urethra, the function of this external sphincter being served in females by contraction of the entire distal urethral meatus and neighbouring musculature.

The bladder wall does not form an elastic sac, but exerts an active controlling influence upon intravesical pressure. Cystometric studies show that the entry of urine into the bladder only momentarily increases pressure before being abruptly and almost completely accommodated by an adjustment in detrusor tone. Tone is maintained by the coordinated but antagonistic activity of the relevant sympathetic and parasympathetic innervation. The compensatory action of the bladder wall in maintaining near-constancy of intravesical pressure is thus under the control of the autonomous nervous system, and is therefore outside voluntary control.

The first stage in reflex voiding occurs when the antagonistic action of the sympathetic and parasympathetic innervation of the detrusor becomes less coordinated, and strong rhythmic detrusor contractions occur. This stage is reached in adults when 200 to 250 ml. of urine is present in the bladder.
Intravesical pressure, formerly increasing only slightly, now rises from approximately 20 ml. of water to pressures in excess of 100 ml. of water.

Voiding itself is not a single reflex action, but a series of interconnected reflexes involving detrusor contraction, reciprocal relaxation of the internal sphincter, relaxation of the external sphincter or equivalent musculature in response to bladder distension, and the maintenance of the urinary stream until the bladder is almost completely empty. Continued detrusor contraction and relaxation of the external sphincter appear to occur in response to the passage of urine through the urethra. Detrusor tension provides a sufficient stimulus for the triggering of the entire micturitional response.

Man normally acquires the capability of initiating and postponing micturition in accordance with social expectations, under all normal circumstances. The ability of man to void the contents of his bladder at almost any degree of bladder filling is almost unique; the only other mammal with a similar capability is the male dog, whose frequent squirting of small amounts of urine is however a sex-linked act under hormonal control. It is unusual to find the functions of a smooth-muscled organ, such as the bladder, subject to voluntary control—especially since the coordinated activity of detrusor and internal sphincter involves very localized neurological reflexes. Partial automatic voiding has been found possible even when the bladder is isolated from central nervous control, through the operation of reflex arcs within the vesical tissue. Voluntary postponement of micturition would seem to be achieved through the cortical
inhibition of these local reflexes at the lower levels of bladder filling. Fluoroscopic study of the act of micturition confirms that the detrusor is not under direct voluntary control, but that the voluntary initiation of micturition involves the stimulation of a wave of detrusor contraction by a sharp descent of the vesical neck. This descent is produced by a deliberate and precise direction of intra-abdominal pressure towards the bladder neck, requiring coordinated use of the diaphragm, pubic floor musculature and pubococcygeus (part of the levator ani muscle) — relaxation of which permits descent of the vesical neck in the pelvis. It has been demonstrated that raising the bladder neck by means of perineal pressure can postpone micturition for prolonged periods (Vincent, 1964).

The ability of man to arrest the urinary stream at will, while less important than his ability to initiate it similarly represents a complex system of muscular actions. Arrest of the urinary stream requires more than solely constriction of the urethra by the external sphincter, involving in addition contraction of the entire levator ani, including the pubococcygeus, in order to lift the bladder neck away from the membraneous urethra. By this means, the walls of the proximal portion of the urethra are coapted, shutting off the passage of urine while detrusor tone is reinstated.

The acquisition of micturitional control

Since voluntary control of micturition demands the accurate manipulation of intra-abdominal pressure by the use of three major muscle groups, children must in a relatively short period acquire a complex neuromuscular skill in sufficient degree to
overcome the "automatic bladder" of infancy and to permit the socially acceptable initiation and postponement of micturition. The skill is complicated by the use of the same three muscle groups to direct intra-abdominal pressure downwards towards the rectum in the act of defecation, and upwards to clear the air passages during coughing or sneezing. These same muscles must be steadied when lifting a heavy weight to prevent accidental urination or defecation. Successful manipulation of intra-abdominal pressure is thus the prerequisite to successful control of micturition.

The child must acquire a number of separate complex physiological and social skills in order to exercise normal urinary control. Firstly, he must acquire the neuromuscular skill of directing intra-abdominal pressure towards the bladder neck - a skill requiring a certain degree of neurophysiological maturation. Secondly, he must learn to discriminate socially acceptable "toilet situations" from inappropriate situations, and to utilize the skills of inhibition and voluntary initiation of micturition to restrict urination to appropriate situations only. Furthermore, the child's social development must be sufficient to permit the necessary adjustments of clothing before full control over eliminative behaviour can be assumed, and the ability to adopt an appropriate posture for urination must be acquired. It is possible that acquisition of the postural skills involved may pose greater difficulties for boys than for girls.

Muellner (1960b) describes four stages in the acquisition of urinary control, based upon fluroscopic examination of over 1,000
children:

(1) infancy; with reflex "detrusor micturition," when
the child can neither perceive bladder fullness nor
control the urinary stream;

(2) from one to two years of age; the child becomes aware
of the imminence of micturition and gradually learns
control. By the age of two, he can "hold" briefly beyond
his first awareness of a full bladder, but can neither
voluntarily initiate the urinary stream nor void when the
bladder is less than full;

(3) from two to three years; bladder capacity increases,
and diurnal control becomes reasonably established;

(4) by 4½ years; bladder capacity is double that at two
years, and most children can initiate and stop the urinary
stream at will, being able to void at relatively low
bladder volumes. The exercise of voluntary control over
micturition tends to increase bladder capacity.

Muellner (1960b) however emphasizes the widely differing rates at
which children acquire these skills.

The process or processes by which control over micturition
is normally achieved remain a matter for speculation. It has
been suggested (Crosby, 1950; Peterson, 1971) that control is
learned through the conditioned avoidance of the assumedly aversive
tactile stimulation of the change from dryness to wetness. The
aversiveness of such stimulation may be considered to arise
partly from the innate "somatic discomfort" involved, and partly
by virtue of learning related to the social contingencies
consequent upon inappropriate micturition. That an operant
learning model may be relevant to the acquisition of urinary
continence is supported by the observation of Pumroy and Pumroy (1965) that an appropriate reinforcement contingency appears to facilitate the learning of bladder control; utilizing the same principle, various signalling devices have been designed to assist in the differential reinforcement of elimination in appropriate locations, in both the home and the institutional setting (Van Wagenen and Murdock, 1966; Van Wagenen et al., 1969; Azrin and Fox, 1971). The foregoing remain, however, plausible learning models for the acquisition of micturitional control rather than proven explanations.

Insofar as the foregoing can be accepted, the control of diurnal micturition and the increment gained in detrusor tone through avoidance of the aversive stimulation of wetness, may be regarded as tending to enlarge functional bladder capacity to the level at which the entire night's output of urine can be retained until morning. Muellner (1960a; 1960b) postulates that bladder capacity is directly increased by the exercise of voluntary control over micturition. Whether changes occur in the spontaneous detrusor contractions occurring at night (Broughton, 1968) as a result of the development of diurnal control of micturition is a question that must remain open to further investigation.

It is possible that the establishment of nocturnal continence is a natural development from the acquisition of diurnal urinary control. Jones (1960b) has put forward the theory that daytime learning, together with neural maturation, may establish cortical "sentinel points" for the inhibitory control of bladder reflexes, remaining locally active during sleep. These sentinel points are considered to awaken the child well before the threshold vesical
pressure for reflex micturition is reached. Crosby (1950) postulates a similar hypothesis, stating that "increasing bladder distension causes an increasing visceral afferent bombardment of the brain, which tends to disperse sleep." If acceptable, such theoretical formulations would suggest that normally, increase in both bladder tolerance and absolute bladder capacity, together with innate and learned aversion to wetness even during sleep (Peterson, 1971), may combine to permit the child to remain both asleep and dry throughout the night - the "cortical sentinel points" affording an additional safeguard.

Failure or breakdown of the hypothesized normal learning pattern would thus constitute primary and secondary enuresis respectively. In addition to the above, Jones (1960b) gives prominence to the probable role of the conditioning of vesical contraction to postural stimuli in the acquisition of voluntary urinary control, the perineal musculature being especially sensitive to localised pressure.

It should perhaps be stressed that the foregoing theoretical explanations are highly speculative and largely unsupported by empirical evidence, the development of bladder control remaining a process in relation to which little concrete data is available.

The probable importance of learning in the normal acquisition of bladder control has given rise to much speculation regarding the effects of deliberate parental training. Bakwin, (1961) believes training to be essential to the development of control, while Muellner (1960b) regards parental training as irrelevant to the co-ordinated use of the appropriate muscle groups. According to the latter view, formal training merely substitutes the toilet-
bowl or pot for the child's clothing at times of elimination, creating an artificial urinary frequency for parental convenience alone. Bostock (1962), in common with many others, implicates excessive or over-rigid training as a major component in the aetiology of enuresis.

Investigation of the actual effects of various patterns of toilet training is rendered difficult by a heavy reliance upon retrospective data gleaned from developmental histories, the questionable reliability of which is notorious (Goddard, Broder and Wenar 1961, Wenar and Coulter, 1962; Wenar, 1963). Using retrospective data, Young (1964) has found a marginal advantage to accrue from early training, although as Newson and Newson (1970) comment, it may well be the spirit in which toilet training is conducted, rather than its timing, which is of importance.

The experimental application of appropriate and systematic reinforcement contingencies (Pumroy and Pumroy, 1965; Van Wagenen and Murdock, 1966; Van Wagenen et al., 1969) has yielded tentative evidence that certain toilet-training procedures may be of value, possibly by making explicit and reinforcing the skills and situational discriminations required. The long-term effects of such training are, however, not known, and it remains a possibility that inappropriate or anxiety-provoking toilet training may under certain circumstances prove detrimental to the normal processes by which micturitional control is established.

Learning and psychodynamic theories of aetiology

The problem of childhood enuresis has long served as a battleground between conflicting schools of psychological opinion,
which present mutually exclusive interpretations of the disorder. One school of opinion maintains that enuresis is a symptom expressive of a child's disturbance, and thus that it should not be eliminated by any methods acting directly upon the symptom, therapy being most properly directed at deeper disturbance, whether overt or inferred; consideration of enuresis as an entity separate from such disturbance is thus commonly rejected. The major alternative viewpoint is to regard urinary continence as learned behaviour, and enuresis as a failure or breakdown of learning. The two major therapeutic approaches to the problem of enuresis, other than the widespread use of drug therapies, are derived from these conflicting theoretical formulations.

Psychodynamic formulations: Psychodynamic formulations regarding enuresis derive from the assumption that the disorder does not occur in isolation, but is an expressive act symptomatic of some deeper emotional disturbance in the child. Wide-ranging interpretations have been offered of the child's lack of bladder control. According to one view, enuresis may represent a self-assertion of the infantile personality against parental influences, bedwetting being an effective medium for such an assertion since the sleeping child may not be held so fully accountable as might be the case were overt hostility towards parents or other societal surrogates to be shown (Mowrer and Mowrer, 1938). In this vein, Michaels (1938) regards "sphincter morality" as the precursor to social morality.

A common theory is that of regression, which states that enuresis, being similar to infantile incontinence, represents the attempted return of the older child undergoing stress to the presumed security of infancy. The enuretic may thus be saying,
by wetting the bed, "I will take the privileges of a baby, which you deny me" (Fenichel, 1946). In one case known to the author, a psychodynamically oriented therapist explained enuresis as a re-creation of the conditions of the womb, in which the child could lie secure in a pool of fluid.

A further major range of interpretation rests upon the assumption that enuresis carries sexual significance. Mowrer and Mowrer (1938) quote Freud's dictum that wherever enuresis does not represent an epileptic attack, it corresponds to a pollution; they further suggest the concept of enuresis as a persistence of narcissistic infantile eroticism into the "latency period", constituting a substitute gratification of repressed genital sexuality. Yates (1970), reviewing the relevant literature, refers to a variety of sexual interpretations of enuresis; among them descriptions of bedwetting as prototypical sexual experience, an attempt in boys to cool off the "fire" of sexual drive or to avoid parental disapproval of a morning erection, and as a weeping through the bladder for love. Fenichel (1946) regards enuresis as frequently a masturbation-equivalent; the incidence of enuresis by age does not, however, lend any support to the theory that enuresis is the expression of a urinary eroticism which is replaced at puberty by more mature genital sexuality (Jones 1960b; Douglas, 1971). As a conversion symptom (i.e. a somatic expression of inner conflict or disorder), enuresis may according to Fenichel (1946) often be regarded as a "discharge instrument of the Oedipus impulses." Theorists have described enuresis as both an aggressive act and an act of passive submission. Bedwetting is thus seen in girls as an active
assumption of the male sexual role through fear of males as destructive aggressors - while in boys it is considered to represent the assumption of a passive female role through fear that destruction by women may be consequent upon playing a male sexual role (Gerard, 1937; Fenichel, 1946). Ferenczi (1925) has reported the actual production of enuresis in a number of normally continent persons, by suggesting retention of urine to test a professed potency in the inhibition of micturition and thus apparently "exhausting" the urinary musculature. This procedure was explained as serving to "unmask a tendency to enuresis with which the patient had been quite unfamiliar and which threw light on important parts of his early infantile history" (Ferenczi, 1925).

The therapeutic implications of the psychodynamic viewpoint tend towards rejection of "symptomatic" therapies as likely to eliminate a symptom fulfilling some dynamic need in the child. The treatment of preference is thus often aimed at effecting deep changes in the child's adjustment, on the assumption that enuresis will disappear when no longer required. A wide range of therapies may thus be employed, the choice depending to a large extent upon the theoretical interpretations attached by the therapist to each individual case. As an extreme example of the direction of therapy towards inferred emotional disturbance rather than a specific functional disorder, a technique practised by A. S. Neill of Summerhill School may be quoted (Neill, 1968). Neill, espousing the regression theory of the aetiology of enuresis, explains a monetary reward given to an enuretic pupil for wetting his bed as a reassurance that his enuresis is of little consequence, and
an encouragement to "live out" his presumed need for regression. Not claiming a cure for enuresis, Neill concludes that wetting is preferable to becoming a "moral prig" through its suppression.

Unfortunately, the various interpretations placed upon enuresis by psychodynamic theorists are by their nature not amenable to experimental investigation, and must therefore remain highly subjective inferences drawn from the existence of enuresis. A common factor, however, is the view that enuresis is frequently representative of a disorder greater than itself, having wider significance than that of a specific functional deficit alone. A key element in this view is the nature of any association that may exist between enuresis and psychiatric disorder in children, consideration of which is thus central to discussion of the aetiology of enuresis. In such consideration, however, it must be stressed that "emotional disturbance" and "psychiatric disorder" are ill-defined terms variously interpreted in different studies, and that subgroups of the total enuretic population, such as secondary enuretics and diurnal enuretics, may reflect aetiological as well as phenomenological differences.

It is possible that any association between enuresis and other disorders may partly derive from similarities in distribution by age, sex and social class; enuresis is a developmental disorder which predominantly affects boys and is known to occur according to a strong social class bias, the incidence being highest among children from the lowest socioeconomic strata. Such a possibility should be borne in mind when evaluating evidence relating to the possible nature and significance of associations between enuresis and other similarly distributed disorders.
Evidence that specific disorders may be related to psychiatric adjustment has been found by Glidewell, Mensh and Gildea (1957), who have reported an association between general level of adjustment and the number, frequency of occurrence and duration of symptoms in children. Considering enuresis as a single disorder, Michaels (1938) reported the incidence to be significantly higher among delinquents than non-delinquent controls, while Stein and Susser (1967) observed that delinquent male enuretics appeared to be submissive and lacking in dominance, leadership and sex interest. Particularly convincing evidence of an association between enuresis and psychiatric disorder has been discovered by Rutter, Tizard and Whitmore (1970) in the Isle of Wight study, where enuresis was found to be associated at a significant level with both "neurotic" and "antisocial" types of psychiatric disorder.

Associations of enuresis with other specific disorders have been reported in various studies. Problems that have been reported to occur more frequently among enuretics than among unaffected children are; nail biting (Michaels and Goodman, 1934; Douglas and Blomfield, 1967), speech impediments (Michaels and Goodman, 1934; Hallgren, 1957) and temper tantrums (Michaels and Goodman, 1934; Stein and Susser, 1967). Michaels and Goodman have also found tentative evidence to suggest that enuresis, together with these three disorders and thumb-sucking, may tend to form a symptom complex. Hallgren (1957), working in Stockholm hospitals, has reported a higher incidence of emotional immaturity among enuretics, although this finding has subsequently been contradicted by Bakwin (1961). Hallgren (1956b) has also noted a positive association between enuresis and both
"nervous" behaviour and speech disorders among diurnal enuretics, but not among children suffering from nocturnal enuresis uncomplicated by diurnal incontinence; possibly indicating that diurnal enuretics may form a somewhat more disturbed sub-group of the total enuretic population. Among adult U.S. Navy recruits, Flag (1964) has found numerous somatic and psychologic disorders to be more common in enuretics than non-enuretics; such as association in adult subjects may however be of little significance in consideration of childhood enuresis.

In considering the positive evidence concerning an association between enuresis and psychiatric disturbance, it is worthy of note that many investigators have suggested that such disturbance may in many cases be secondary to enuresis; the product rather than the cause of being enuretic (Davidson and Douglass, 1950; Cust, 1958; Bakwin, 1961; Lovibond, 1964; Yates, 1970). Certainly, enuresis is a source of embarrassment to the sufferer, often invoking ridicule or punishment, and can place a heavy burden upon intrafamilial relationships - especially in large, overcrowded families where several children may wet the bed. For many enuretics, to be a bedwetter may carry adverse emotional consequences, and some probably exhibit a degree of reactive disturbance. Enuresis may place an additional burden upon a child suffering from multiple difficulties, and creates the onerous, unpleasant and often daily task of washing urinous bed-linen. At best, bedwetting imposes a limit on the child's choice of activity; few enuretics can happily stay with friends or go camping.
On discovering an association between enuresis and delinquency, Michaels (1938) concluded that both are reflections, at different levels, of a fundamentally disturbed personality. There are, however, two somewhat more parsimonious conclusions that may be drawn; firstly that the background of disordered family life which appears conducive to the persistence of enuresis (Stein and Susser, 1967) may also be conducive to other forms of disturbance, suggesting that enuresis and delinquency may be independent and co-incidental manifestations of a disorder existing in family relationships rather than in the personality structure of the delinquent enuretic. Secondly, correlations between various childhood disorders may be expected solely from the statistical coincidences of age/incidence curves, correlations strengthening for more persistent disorders (Tapia, Jekel and Domke, 1960). Tapia and his co-workers comment that enuresis may perhaps be an "ubiquitous happenstance", existing independently of other disorders and thus either in isolation or in association with them.

While there would appear to be some degree of association between enuresis and psychiatric disorder, there is little evidence that enuresis may be associated with any particular type of disturbance (Shaffer, 1971), and several studies indicate that the association may be both slight and limited to a minority of extreme cases. Tapia, Jekel and Domke (1960), investigating 830 families, placed each child into one of four categories of adjustment according to the nature, frequency, duration and severity of symptoms in 21 areas of difficulty, as elicited by
parent questionnaires and teachers' ratings. No significant relationship was found between enuresis and psychiatric disturbance, or between enuresis and any other symptom; it is noteworthy that 8.3 per cent of those considered by their teachers to be totally asymptomatic were in fact enuretic. These authors concluded that disturbed children are not particularly prone to enuresis, nor are enuretics particularly prone to disturbance. Baker (1969), using a self-report questionnaire and teachers' behaviour rating scales, failed to differentiate enuretics from controls on any single item or by total score; the same investigator also found that enuretics were not characterized by their responses to the projective "Draw-a-Person" or "Draw-your-Family" tests, and that psychologists could not distinguish between enuretics and non-enuretics in terms of general adjustment as indicated by these tests. Douglas and Blomfield (1967) found no higher incidence of specific abnormalities other than bitten nails among enuretics when compared on medical examination with non-enuretics, the groups also being comparable with respect to the doctors' global assessment of behaviour. Bakwin (1961) failed to discover any well-defined disorders differentiating enuretics from other children, and Lovibond (1964), using a battery of tests, confirms the finding of Tapia, Jekel and Domke (1960) that in general enuresis tends not to be associated with poor psychiatric adjustment except in extreme cases of maladjustment. A similar finding has recently been reported by Kolvin et al. (1971), who found enuresis not to be associated with "widespread current psychological maladjustment."
In considering the possible association of enuresis with psychiatric disturbance, the conclusion may be drawn that there is some evidence of a statistical correlation between the two, particularly among older enuretics (Rutter, Tizard and Whitmore, 1970), but that causation is not established. Taking into account the paucity of evidence in favour of a consistent association, the contrary evidence regarding such an association, the age and social class distribution of enuresis and other disorders, and the common observation that most enuretics "grow out" of the disorder in time without psychiatric sequelae, it must be concluded that an association between enuresis and psychiatric disturbance should not be assumed in the majority of cases. The majority of enuretics would appear to be normal apart from their enuresis; reviewing the relevant literature, Shaffer (1971) comments that although emotional disorders are more common among enuretics than non-enuretics, the majority of enuretics are nevertheless psychiatrically normal. Apart from the minority of cases in which major co-existing psychiatric or structural disorder is present, enuresis may be classified as a specific developmental disorder (Rutter, 1965; Rutter et al., 1969). Present evidence does not appear to justify exclusively psychodynamic interpretations of enuresis even in a context of co-existing multiple problems, and symptomatic treatment does not appear to be contraindicated on aetiological grounds.

Learning theory: Formulations of the aetiology of enuresis according to learning theory differ from the psychodynamic viewpoint in that bedwetting is regarded as a specific deficit disorder. Learning theory postulates that bladder control may be regarded as learned behaviour, and enuresis as a failure to
acquire or maintain appropriate learned responses.

Some support is lent to the hypothesis that environmental stresses rather than internal conflicts may be partly responsible for interference with the normal process of acquisition of bladder control, by the discovery of an association between the persistence of enuresis into later childhood and both familial inadequacies and familial disruption, the problem persisting longest where family pathology is most severe (Stein and Susser, 1967). This view may be further supported by the finding of Umphress et al. (1970), in a comparison of 26 adolescent enuretics with non-enuretic controls that enuresis is adolescents is related to inappropriate, rejecting and inconsistent parental attitudes, although it is possible that such attitudes may be secondary to the enuresis. Enuresis persisting over a long period has been found to be particularly closely related to emotional disturbance (Lovibond and Coote, 1970; Rutter, Tizard and Whitmore, 1970) and to delinquency (Michaels, 1938). It is thus conceivable that enuresis tends to persist and to occur in conjunction with wider disturbance where it is associated with environmental factors (particularly within the family group) conducive to general disruption of behaviour, including the acquisition of continence.

That it is possible for behaviour disorder to represent nothing more sinister or complex than inappropriate learning has been indicated by Ayllon, Haughton and Hughes (1965), who successfully conditioned a hospitalized female schizophrenic to become a compulsive broom-carrier, subsequently extinguishing this behaviour (which had been variously interpreted by two experimentally naive psychiatrists) by the withdrawal of all
reinforcement. Although the similarity of this conditioned behaviour to that encountered in genuine psychiatric illness is questionable (Davison, 1970), and while such an experiment cannot be regarded as a suitable model for all abnormal behaviour, the study does suggest that it may not be justifiable to infer the presence of deeper disturbance solely from the presence of a symptom.

There is no single universally accepted learning model for the aetiology of enuresis, and insufficient evidence exists to permit fully informed judgement between alternative theoretical formulations. Fortunately, regardless of the specific learning model favoured, the therapeutic procedures derived from a behavioural approach to enuresis do give rise to testable hypotheses relating to the efficacy of treatment.

Learning formulations are predicted upon the assumption of adequate physiological maturation for micturitional control. An early model was provided by Mowrer and Mowrer (1938), who suggested that in civilized countries, children are deprived of the immediate reaction to urination at night provided in primitive societies by a parent who sleeps in close physical proximity to the child. These authors regarded the use of an "enuresis alarm" as a mechanical means of reinstating this immediate response to urination. A further model ascribes enuresis as being in part due to individual differences in "conditionability" (Lovibond, 1964).

Yet another possible model for the aetiology of enuresis in terms of learning theory has been suggested in consequence of experimental evidence concerning the relevance of what may be
Figure 1. The theoretical relationship of drive strength and performance at three levels of task complexity. (Adapted from Lader and Marks, 1971).
loosely termed "drive levels" to learning and performance (Young, 1965d; Morgan and Young, 1972; 1973). According to this view, inappropriate levels of drive might exert a decremental effect upon the acquisition or maintenance of learned continence.

Unfortunately, this theory does not lend itself easily to direct test, since measures of "drive", particularly in children, are far from adequate, and it is rarely possible to assess drive or anxiety at the time when it may be affecting continent behaviour. The theory postulates inappropriate drive levels during early toilet training or immediately prior to the onset of "secondary" enuresis, but not necessarily persistent thereafter.

The "drive level" theory is largely based upon the work of Yerkes and Dodson during the early part of the present century. These investigators, studying the performance of mice in a brightness discrimination task, observed that the increase of motivation (a combination of hunger drive and punishment by electric shock) beyond an optimal point led to a decrement in learning (Yerkes and Dodson, 1908). It was also observed that this optimal level of motivation was lower for more complex tasks. Similar results were later obtained by Dodson (1915), and the observations were later formulated into the "Yerkes-Dodson Law", which states (Eysenck, 1960b) (see Fig. 1):

1. Efficiency of learning is a curvilinear function of drive strength, some intermediate level of drive being optimal.
2. Optimal drive strength is an inverse function of the difficulty of a learning task.

Numerous investigators have conducted experiments to examine the possible applicability of the above formulations to human
learning. Results concerning the relationship of anxiety, as measured by a manifest anxiety scale (Taylor, 1953; Castaneda, McCandless and Palermo, 1956), to human performance have produced results tending to support the Yerkes-Dodson formulations, at least in relation to laboratory learning tasks. Matarazzo, Ulett and Saslow (1955) observed the performance of subjects assigned to seven levels of anxiety on the basis of manifest anxiety scores, on a stylus maze task. Evidence was found of a curvilinear relationship between anxiety level and performance measured in terms of time, although a rectilinear relationship was observed when number of trials was used as the measure of performance. Spence and Farber (1953) found that high manifest anxiety facilitated the learning of a simple eyelid conditioning task, while in the more complex task of stylus maze learning, high manifest anxiety appeared to interfere with learning (Farber and Spence, 1953). Using subjects at two levels of manifest anxiety, with three levels of task complexity in nonsense syllable learning, Montague (1953) found anxious subjects to perform less well than non-anxious subjects on the most difficult task, surpassing non-anxious subjects in performance of the easiest task.

Similar results have been reported for child subjects on a "light-button motor task" by Castaneda, Palermo and McCandless (1956), who reported a significant interaction between task complexity and anxiety as measured by the Children's Manifest Anxiety Scale (Castaneda, McCandless and Palermo, 1956). Palermo, Castaneda and McCandless (1956) have also reported that children having high manifest anxiety scores made significantly
more errors in the performance of this task.

Taffel (1955), conditioning hospitalized psychiatric patients to give verbal responses to stimulus cards, has found the amount of conditioning achieved to be a function of manifest anxiety score, Taylor (1951) reporting a similar result in an eyelid conditioning task. Sarason (1958) has subsequently reported a significant association between high test anxiety scores and a high level of verbal conditioning. These studies do not demonstrate the Yerkes-Dodson predictions in their entirety, but they do indicate the possible relevance of anxiety, as measured, as a factor in learning.

In studies involving the deliberate manipulation of anxiety, Gordon and Berlyne (1954) have reported a significant decrement in the performance of highly anxious subjects on a paired-associate nonsense-syllable learning task following drive-increasing instructions, while Taylor (1951) found no difference in the performance of a relatively simple eyelid conditioning task between subjects with high manifest anxiety scores and those with low manifest anxiety scores following anxiety-producing or anxiety-relieving instructions. Stennett (1957) found strong support for the hypothesis of a "u"-shaped relationship between "arousal" and performance on an auditory tracking task under different conditions of incentive; "arousal" being measured by electromyographic recordings of tonic muscular tension, together with measurement of palmar conductance.

In addition to the effects of anxiety upon performance in learning tasks, the resistance of conditioned eyelid responses to extinction has been found to be greater among subjects having high
manifest anxiety scores (Spence and Farber, 1953), while Mednick (1957) has found stimulus generalization to be greatest among subjects with medium manifest anxiety scores and least among those with low scores. There is also some evidence that anxious subjects may be more suggestible, this evidence deriving from the responses of adolescent boys using an autokinetic apparatus (Walters, Marshall and Shooter, 1960).

The most common theoretical interpretation of the Yerkes-Dodson phenomena has been formulated in terms of Hullian theory (Montague, 1953; Gordon and Berlyne, 1954; Taylor, 1956; Broadhurst, 1960; Jones, 1960a; Spence and Spence, 1966; Spielberger, 1966a; 1966b; Levitt, 1967) in which the excitatory potential which determines the strength of a response is considered to be a multiplicative function of total effective drive state and habit strength. In terms of this formulation, high anxiety is hypothesized as increasing the competing erroneous response tendencies assumed to be more numerous in more complex learning tasks; in simple tasks with relatively few competing response tendencies, high anxiety is regarded as primarily increasing the excitatory potential of the desired response.

Malmo (1966) has conceptualized the relatively poor performance of high-anxiety subjects on serial rote learning tasks as the effect of interference with the learning process through "overactivation," as indicated by electromyographic recordings. Castaneda (1956) has made a closer study of the hypothesis interpreting the interaction of drive and task complexity in terms of competing response tendencies, increasing stress by emphasising speed of response in a situation designed
to manipulate the dominance of incorrect response tendencies by means of demanding responses different from those previously learned. The results, although not unequivocal, did indicate that with child subjects stress was associated with more errors where incorrect response tendencies were dominant.

Lucas (1952), in a verbal memory task, found highly anxious subjects to respond to failure with a decrement in subsequent performance, postulating that the increased anxiety consequent upon "failure" may have raised the excitatory potential of incorrect responses. An adverse effect upon the performance of a similar task by anxious subjects, consequent upon "failure" in both relevant and irrelevant tasks, has also been reported by Sarason (1957).

Although the experimental evidence cited above is far from conclusive, and the observed results lend themselves to various alternative theoretical interpretations (Jones, 1960a), the Yerkes-Dodson principle may be considered as a highly tentative but parsimonious description of observed events. Consideration of this principle in relation to the learning of urinary continence suggests three major variables which may affect the ability of any particular child to acquire bladder control; (1) his optimal level of drive for a task of a given complexity, (2) the degree of complexity represented to the child by the task of acquiring bladder control, and (3) the level of drive induced in the child by his environment. The relative difficulty of the task of acquiring bladder control may be expected to differ between individuals, individual differences operating as in any other field of ability, and environmental stresses which may induce high
drive levels, whether general or specifically related to toilet training, may be expected to affect one child more than another.

This tentative aetiological model may be further elaborated by inclusion of the concept of a "sensitive period" for the acquisition of bladder control, during which the child's sensitivity to appropriate learning situations may be regarded as most acute. (MacKeith, 1968; and Connolly, 1972). There is tentative evidence that disturbing events during approximately the third year of life are associated with subsequent enuresis (Young, 1965d; Douglas, 1967; 1971; MacKeith, 1968). Douglas (1967) has reported an exposure to environmental stress among 19 per cent of the enuretics, and 7.6 per cent of the non-enuretics, from his series of 5,000 children. In a controlled investigation of 320 enuretic children, Young (1965d) has reported an exposure to stressful circumstances during the first three years of life among 85.9 per cent of the enuretics, compared with 53.2 per cent of their non-enuretic controls. The wide divergence in the reported incidence of stressful circumstances between these two studies may be attributable to different definitions of "stress" and to differences between the epidemiological approach of Douglas and the use of a clinical sample by Young.

Consideration of the foregoing evidence has led to the theory that enuresis may not merely represent a developmental delay (MacKeith, 1972), but that stresses and anxiety during the postulated "sensitive period" may produce over-optimal levels of drive which, insofar as the Yerkes-Dodson formulations may be regarded a justifiable and relevant induction from experimental
evidence, might be expected to act to the detriment of learning and render the child enuretic (Young, 1965d; MacKeith, 1968, 1972; Morgan and Young, 1972). Secondary enuresis often appears to occur in consequence of some precipitating stressful event (Hallgren, 1957; Young, 1965d), and it has been suggested that in the case of the secondary enuretic, a learned pattern of control has been disrupted by the intrusion of some new anxiety-provoking stimulus, such as disturbances in the family or problems at school (Young, 1965d; MacKeith, 1968; Morgan and Young, 1972). According to this theoretical view, appropriate learning is considered less likely to occur subsequent to a sensitive period, early transient stress thus being expected to produce primary enuresis, and secondary enuresis being expected to persist even when its postulated provoking stress has been relieved. Within such a theoretical construct it is conceivable that stress attaching to toilet-training may under certain circumstances exert a decremental effect upon the acquisition of normal bladder control (Bostock and Shackleton, 1951; 1952; 1956; Bostock, 1954; Behrle, Elkin and Laybourne, 1956; Brazleton, 1962; Young, 1965d).

Evidence that other disturbances tend to be more frequent accompaniments to secondary than to primary enuresis (Hallgren, 1957; Kolvin, 1971; Kolvin et al., 1971) lends tentative support to the theory that secondary enuresis may represent a breakdown in learning consequent upon novel environmental stresses, which may be expected to increase the likelihood of occurrence of problems other than enuresis.

Although plausible, the above aetiological model is not presented here as an exclusive or adequately demonstrated
formulation; many variations of emphasis and interpretation regarding the evidence presented are possible, and other data may give rise to other formulations. The model is presented as one conceivable view of the phenomena of enuresis, of necessity requiring certain assumptions and generalizations in its induction from observable data. Its major therapeutic implication is that such a model, or one similar, is at least equally plausible with formulations tending to oppose a symptomatic approach to the treatment of enuresis, and thus that such an approach may be considered sufficiently justifiable on theoretical grounds to permit its further empirical investigation.

The conditioning treatment of enuresis

The most common theoretical assumption underlying the conditioning treatment of enuresis is that whatever influences may have led to a failure or breakdown of learning, appropriate learning in the field of bladder control may best be effected by maximising the impact of the relevant learning situation. Even a relevant organic lesion may be regarded as imposing a complicating factor upon the task of acquiring bladder control, not contraindicating a conditioning approach to treatment provided that any lesion or infection present is discovered and treated if necessary. It would appear reasonable in such cases to utilize conditioning treatment to create a situation conducive to the maximum possible degree of learning in the sphere of urinary continence. Much is probably to be gained in terms of confidence and self-esteem if a child presenting an organic lesion can be trained to the maximum level of urinary control of which he is organically capable.

An early recorded suggestion of a conditioning treatment for enuresis appeared in a paper written by Nye in 1830 (Glicklich, 1951)
Figure 2. The Enuresis Alarm Apparatus.
which proposed training by means of a mild electric shock administered as urine soaked a sponge in the vicinity of the external urinary meatus. No trial of the technique is, however, known. In 1904, Pfaundler accidentally discovered the therapeutic effects of a signal used to alert nurses to wet beds. Modern conditioning techniques were independently described and discussed by Morgan and Witmer (1939) and by Mowrer and Mowrer (1938); both papers reported favourable trials of the treatment. Present day conditioning treatment fundamentally seeks to create a learned pattern of continent behaviour through the use of an enuresis alarm employing an auditory stimulus (Jones, 1960b; Young, 1965b; Turner, Young and Rachman, 1970; Yates, 1970; Morgan and Young, 1973).

The type of enuresis alarm in use at the Vale Drive clinic, in which the present investigation was conducted, is a development of the design of Mowrer and Mowrer (1938). The alarm utilizes a powerful buzzer or oscillator as an auditory stimulus, which is triggered when urine completes an electrical circuit between two gauze detector mats beneath the sleeping child (Fig. 2). To facilitate rapid penetration of urine to the sheet separating the two detector mats, thereby completing the circuit, the child is instructed to sleep naked below the waist. The alarm, when triggered, is switched off by the child, who then completes urination in the toilet.

Although there is a therapeutic benefit to be gained from the fact of arousal to urinate when arousal is not contingent upon wetting (Young, 1964a; Turner, Young and Rachman, 1970; Turner, 1971), this effect is inferior to that obtainable by the
use of an enuresis alarm (Young, 1964a; Baker, 1969; Peterson, Wright and Hanlon, 1969). There is also evidence of a therapeutic effect deriving from non-specific elements in the context of treatment (Baker, 1969; Peterson, Wright and Hanlon, 1969; Turner, 1971). De Leon and Mandell (1966) have reported a significant reduction in wetting attributable to the "instructional effect" of knowing that treatment would be forthcoming. It is common clinical experience that conditioning treatment appears to be assisted by high expectations of success, and by a favourable and impressive clinical context. Care in the explanation and supervision of treatment procedures is always well rewarded. It is possible that in the majority of cases, both a high level of interest and involvement on the part of the therapist, and the maintenance of a simple record of wet and dry nights, may assist the conditioning process by positive reinforcement of progress in treatment. The reduction of stress imposed upon the child through parental intolerance of wet beds also appears to assist treatment.

Although further research is needed to identify both the major non-specific therapeutic factors and to elaborate their precise mode of operation, it may be postulated that conditioning is the central process in treatment, and that the learning processes involved may be significantly assisted by the creation of an appropriate therapeutic context.

Conditioning would appear to be a gradual process, the effect of which only becomes apparent to a significant extent after the first month of treatment in the majority of cases (Turner, Young and Rachman, 1970). Some patients, however, respond to
conditioning treatment with extreme rapidity, before sufficient conditioning trials have taken place for improvement to be explicable in terms of learning acquired during treatment. Such rapid improvement, following prolonged exposure to the normal learning situation, is consistent with the hypothesis of latent learning, which seeks to explain such phenomena in terms of a sudden increment in the performance of responses presumed to have been learned but not performed until some precipitating change in circumstances is introduced (Stevenson, 1954; Rachman, 1963; Eysenck and Rachman, 1965).

It has been hypothesized by Eysenck (1957; 1960a; 1960b) that introverts should prove more amenable to conditioning than extraverts, and that the use of CNS stimulant drugs to adjust the position of an individual on the introversion-extraversion dimension of personality should facilitate conditioning. The rate of relapse to enuresis following initial cure has in one study been found to be significantly higher among extraverted children (Young, 1965c), and although Kennedy and Sloop (1968) failed to confirm the finding in a small-scale replication study, there is evidence that the speed of acquisition of continence may be increased by the use of stimulant drugs adjuvant to the conditioning process (Young and Turner, 1965). This increased speed of initial cure, however, appears to occur at the expense of an increased relapse rate, particularly where the drug Dexedrine (dexamphetamine sulphate) is prescribed (Turner and Young, 1966).

Results of conditioning treatment: The success of conditioning treatment in producing initial arrest of enuresis has been well
established. Young (1969) lists 19 studies in which the percentage initial success rates of conditioning treatment ranged from 63 to 100 per cent - in many of these studies, defaulters from treatment were classified as failures. Turner (1971) calculates the average initial success rate over a list of 17 studies as 81.4 per cent. Table three presents a summary of the results of 21 clinical trials, although the wide variations in definitions, criteria and methodology between studies must be borne in mind.

The average initial success rate of the studies listed in table three is 80.8 per cent, with an average reported relapse rate of 27.3 per cent. It should be noted that wide variation in recorded relapse rates arises from non-comparability of methods and periods of follow-up.

<table>
<thead>
<tr>
<th>Author</th>
<th>No. of cases</th>
<th>% success</th>
<th>% relapse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behrle et al (1956)</td>
<td>20</td>
<td>75</td>
<td>32</td>
</tr>
<tr>
<td>Biering &amp; Jespersen (1959)</td>
<td>21</td>
<td>71</td>
<td>20</td>
</tr>
<tr>
<td>Bostock (1954)</td>
<td>12</td>
<td>67</td>
<td>-</td>
</tr>
<tr>
<td>Crosby (1950) (1)</td>
<td>58</td>
<td>90</td>
<td>21</td>
</tr>
<tr>
<td>Davidson &amp; Douglass (1950)</td>
<td>20</td>
<td>75</td>
<td>5</td>
</tr>
<tr>
<td>De Leon &amp; Mandell (1966)</td>
<td>56</td>
<td>86</td>
<td>80</td>
</tr>
<tr>
<td>Dische (1971)</td>
<td>84</td>
<td>92</td>
<td>30</td>
</tr>
<tr>
<td>Forsythe &amp; Redmond (1970)</td>
<td>200</td>
<td>66</td>
<td>-</td>
</tr>
<tr>
<td>Freyman (1963)</td>
<td>71</td>
<td>65</td>
<td>35</td>
</tr>
<tr>
<td>Geppert (1953)</td>
<td>42</td>
<td>91</td>
<td>13</td>
</tr>
<tr>
<td>Gillison &amp; Skinner (1958)</td>
<td>100</td>
<td>90</td>
<td>14</td>
</tr>
<tr>
<td>Kahane (1955)</td>
<td>21</td>
<td>100</td>
<td>62</td>
</tr>
<tr>
<td>Lovibond (1963b)(2)</td>
<td>36</td>
<td>94</td>
<td>35</td>
</tr>
<tr>
<td>Lovibond (1964)(2)</td>
<td>96</td>
<td>96</td>
<td>-</td>
</tr>
<tr>
<td>Mowrer &amp; Mowrer (1938)</td>
<td>30</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>Seiger (1952)</td>
<td>106</td>
<td>89</td>
<td>4</td>
</tr>
<tr>
<td>Turner &amp; Young (1966)</td>
<td>105</td>
<td>65</td>
<td>32</td>
</tr>
<tr>
<td>Turner et al. (1970)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Wickes (1958)</td>
<td>100</td>
<td>65</td>
<td>14</td>
</tr>
<tr>
<td>Wickes (1963)</td>
<td>445</td>
<td>74</td>
<td>-</td>
</tr>
<tr>
<td>Young (1965b)</td>
<td>105</td>
<td>65</td>
<td>13</td>
</tr>
</tbody>
</table>

(1) Using electric shock as a waking stimulus
(2) Using a "Twin-Signal" apparatus deriving from an avoidance learning paradigm (described below).
Although there appears to be a significant "waiting list effect" tending to reduce wetting prior to the commencement of conditioning treatment (De Leon and Mandell, 1966), possibly as a function of reduced anxiety, the use of an enuresis alarm has been found superior to a waiting-list control for spontaneous remission of the disorder (Werry and Cohrssen, 1965; De Leon and Mandell, 1966; Baker, 1969), and to a placebo (Kolvin et al., 1971). Werry and Cohrssen (1965), using a total sample of 70 children at the Montreal Children's Hospital, have conducted a controlled comparison of conditioning and brief psychodynamically-oriented psychotherapy, assessing outcome in four categories. They report no significant difference between brief psychotherapy and no-treatment control in terms of outcome, while conditioning was found to be superior to both groups. Although only six to eight sessions of psychotherapy were given, and therefore the technique may not have been adequately applied, the practical point remains that conditioning treatment achieved a significantly greater therapeutic response in an equivalent period of time.

De Leon and Mandell (1966), using a total of 87 subjects, similarly compared conditioning treatment with psychotherapy and control groups, psychotherapy being carried out by a psychiatrist, psychologist or (in two cases), a psychology intern. Initial arrest of enuresis was achieved in 86.3 per cent of the conditioning group, compared with 18.2 per cent of the psychotherapy group and 11.1 per cent of the control group, the overall superiority of conditioning reaching a high level of significance. The relapse rates for both conditioning and psychotherapy groups were extremely high, being 79.6 and 100 per cent respectively.
Although the content of "psychotherapy" could not be defined, it would seem that conditioning treatment is both more rapid and effective in achieving its initial results than is psychotherapy, but that its long term efficacy is not established by these two studies.

A major drawback to the conditioning treatment of enuresis has been a relapse rate of approximately 30 per cent (Lovibond, 1964; Young, 1969; Turner, Young and Rachman, 1970; Young and Morgan, 1973a). Attempts to counteract the relapse problem by the use of intermittent reinforcement schedules have failed to achieve significant results (Lovibond, 1964; Turner, Young and Rachman, 1970); there is however evidence that the relapse rate may be significantly reduced by the use of an "overlearning" procedure (see Chapter Six) (Young and Morgan, 1972c; 1972d).

The evidence regarding the treatment of enuresis by conditioning techniques indicates that such treatment represents an effective approach to the problem. One major drawback, that of relapse, may be amenable to reduction by means of overlearning. In evaluating the practical efficacy of any treatment, however, it is necessary to take into account the losses from the patient population as it progresses through treatment (Kiesler, 1971). Evaluation of outcome based exclusively upon cases which remain cooperative throughout treatment represents an over simplified view and permits no estimation of the "behavioural cost" of therapeutic procedures to the patient and his family. Consideration of these "losses" to the patient population is given in the subsequent chapters of the present study.
Objections to conditioning treatment: A frequent objection to the direct "symptomatic" treatment of enuresis by conditioning techniques is that the elimination of enuresis by these methods may lead to harmful consequences for the child's emotional adjustment. Specific predictions made are that, since a disturbed child is assumed to require an expressive symptom, a substitute symptom may emerge following the removal of enuresis; and that by removing enuresis, disturbance will be increased. Baker (1969) has investigated the "symptom substitution" prediction in a well-controlled study involving 30 enuretics and 60 control subjects, finding no supporting evidence and concluding that the prediction is untenable. He also noted an improvement in adjustment following treatment, as measured by self-report questionnaires and parent-completed rating scales.

Although the contrary evidence is largely anecdotal apart from the study by Baker described above, the occurrence of symptom substitution has yet to be proven, most clinicians noting its absence (Mowrer and Mowrer, 1938; Kahane, 1955; Behrle, Elkin and Laybourne, 1956; Gillison and Skinner, 1958; Jones, 1960b; Freyman, 1963; Werry and Cahrssen, 1965; Young, 1965b; Yates, 1970; Silberstein, 1972). Geppert (1953) estimated that 84 percent of his subjects improved in adjustment subsequent to conditioning treatment of enuresis, and it is the widely reported experience of therapists that adjustment tends towards improvement rather than deterioration following treatment (Mowrer and Mowrer, 1938; Morgan and Witmer, 1939; Davidson and Douglass, 1950; Seiger, 1952; Behrle, Elkin and Laybourne, 1956; Wickes, 1958; Biering and Jespersen, 1959; Jones, 1960b; Werry and Cohrsen, 1965; Young, 1965b; Yates, 1970; Morgan and Young, 1972; Silberstein, 1972).
There appears to be little support for the assumption that enuresis is part of a somatic language expressive of psychiatric disturbance, and that an enuretic needs, and should not be deprived of, his bedwetting. It would, on empirical grounds, appear gratuitous to assume that because a child cannot control his bladder function, he must need to be unable to do so, and either to interpret enuresis occurring in isolation in terms of inferred disturbance, or to assume causation where enuresis appears in conjunction with concurrent disturbance. It would seem to be parsimonious to regard enuresis as a useless and troublesome habit from which appropriate training may provide relief.

**Paradigms for the conditioning treatment of enuresis**

The various paradigms presented below are treated separately for convenience, although it should be recognized that the present state of knowledge regarding the relevant processes is not sufficient to permit exclusive allegiance to any single paradigm. Conditioning treatment may well comprise many differing processes, and it would not be desirable to consider the separate paradigms that have been suggested as being in any actual manner discrete.

The classical paradigm: Mowrer and Mowrer (1938) regarded the treatment of enuresis as an example of classical conditioning, although as Turner, Young and Rachman (1970) point out, the fact that the alarm can only be triggered in consequence of a response made by the subject introduces an instrumental element. Lovibond (1964) also rejects description of the treatment process in classical terms on the grounds that the CR (inhibition of micturition) is not neutral with respect to the CS (bladder distension), but prior to treatment is the opposite response to the original UCR of reflex micturition. In relative terms,
a) Pre-treatment stage;

UCS  
Threshold detrusor tension  
UCR  
Micturition

b) During treatment;

(1) UCS (CS)  
1  
Threshold detrusor tension  
UCR  
1  
Micturition

UCS  
2  
Alarm stimulus  
UCR (CR)  
2  
Reflex inhibition of micturition

(2) UCS (CS)  
1  
Threshold detrusor tension  
UCR  
1  
Micturition

UCS  
2  
Alarm stimulus  
UCR (CR)  
2  
Waking

c) Post-treatment stage;

CS  
Threshold detrusor tension  (Generalized to sub-threshold levels of tension)  
CR  
1  
Inhibition of micturition

CR  
2  
Waking

Figure 3.  
A classical paradigm for the conditioning treatment of enuresis.
however, the evocation of the opposite response is quantitatively rather than qualitatively different from the evocation of a neutral response.

According to the classical conditioning paradigm, the enuresis alarm conditions in the child the two separate responses of awakening and of the reflex inhibition of micturition, both in competition with the response of reflex urination to the stimulus of bladder filling. These responses, repeatedly evoked, eventually supercede that of reflex urination. That micturition can be inhibited by an alarm stimulus was noted by Mowrer and Mowrer (1938), and that it is possible for inhibition to occur without waking to the sound of an alarm has been reported by Lovibond (1964) and by Lovibond and Coote (1970). This latter phenomenon has been occasionally observed by the present investigator.

Figure three presents schematically a basic classical paradigm for the conditioning treatment of enuresis. Threshold detrusor tension normally evokes the response of micturition (Fig. 3(a)). Because the enuresis alarm causes an external stimulus to follow immediately upon the commencement of micturition, the responses of inhibition of micturition and of waking are made to occur in close temporal contiguity with detrusor tension (Fig. 3(b)). It is hypothesized that learning thus takes place, by which threshold detrusor tension becomes the CS for the reflex inhibition of micturition and for waking, which thus become CR₁ and CR₂ as the two responses conditioned to the stimulus which formerly evoked reflex micturition. Stimulus generalization of the capacity of the new CS to inhibit micturition (to evoke CR₁) to sub-threshold bladder tensions tends to raise the general tone of the bladder.
muscle (the detrusor) so that the threshold level of bladder tension is raised. Functional bladder capacity thus rises, and waking will intervene before urination, the child ideally acquiring the capability of sleeping for the entire night without either wetting or waking. It may also be that the frequency and intensity of spontaneous nocturnal bladder contractions (Broughton, 1968) are reduced to a level at which they are unlikely to culminate in wetting. In those cases in which diurnal wetting accompanies nocturnal enuresis, the inhibition of reflex bladder voiding learned by night appears to operate during the day also, conditioning treatment of nocturnal enuresis tending to relieve patients of concurrent diurnal wetting (Gillison and Skinner, 1958; Young, 1965a; Lovibond and Coote, 1970; Dische, 1971). There has unfortunately been no detailed study of the extent to which this occurs.

**The avoidance paradigm:** Lovibond (1963b; 1964; Lovibond and Coote, 1970) has described the conditioning treatment of enuresis according to a passive avoidance conditioning ("punishment") paradigm, in which the kinaesthetic stimuli arising from the micturition response are considered to become the discriminative stimuli for avoidance of an assumedly noxious alarm stimulus by means of the inhibition of micturition. The acceptance of a passive avoidance paradigm may lead to consideration of the intensity and duration of the noxious stimulus as possibly critical variables affecting the efficacy of avoidance learning (Lovibond, 1964; Turner, Young and Rachman, 1970), although Young and Morgan (1973c) have found no significant differences in therapeutic response between enuresis alarms at three different sound levels. Lovibond (1964), utilizing the avoidance paradigm,
has suggested from animal experiments in which the administration of "free shocks" appeared to maintain avoidance behaviour in rats, that the deliberate administration of "false alarms" during treatment and following the arrest of enuresis may similarly counter the problem of relapse. This suggestion has, however, not been supported by empirical data.

Hypothesizing that provision for escape from the noxious stimulus should facilitate avoidance conditioning, Lovibond (1964) developed a "Twin-Signal" alarm apparatus which provided for both avoidance and escape training by means of a loud noxious stimulus of one second's duration, followed by a one-minute silence before the sounding of a second, softer, warning buzzer. The duration of the noxious stimulus (a 240v. industrial warning klaxon) was chosen to exceed by a small margin the latency and response of sphincter contraction, which thus appeared to provide escape from the aversive stimulus. From a clinical trial involving 36 children, Lovibond concluded that a twin-signal apparatus is more effective in producing initial arrest of enuresis than either a Crosby (1950) apparatus (employing an electric shock stimulus) or a traditional Mowrer type of alarm. The predicted resistance to relapse with the twin-signal system was, however, not found.

Investigating the efficacy of the twin-signal type of apparatus, Turner, Young and Rachman (1970) compared twin-signal with continuous-signal alarms, holding stimulus intensity constant at 80dB. Using groups of 11 and 12 children respectively, the mean number of conditioning trials to an initial cure criterion of 14 consecutive dry nights was not found to differ significantly between groups treated with each alarm type.
Escape is, however, not a necessary component of passive avoidance conditioning, and the evidence indicates that it is inconsequential to the learning of urinary continence. The efficacy of the original twin-signal apparatus in achieving initial cure was probably due to the great stimulus intensity (in excess of 100dB) of the early instrument and not to the provision of escape training (Lovibond, 1964; 1972; Turner, Young and Rachman, 1970). There are also four alternative explanations which may account for the failure of the twin-signal apparatus to support Lovibond's (1964) predictions relating to escape training; (1) the one-second duration of the noxious stimulus may not correspond sufficiently closely to the duration of sphincter contraction, (2) response to the auditory stimulus may not commence until some time after the onset of the stimulus, (3) the second buzzer of the twin-signal apparatus may be sufficiently aversive to dilute any escape training effect that may have occurred, and (4) the auditory stimulus employed may not be particularly aversive for many children.

Lovibond (1972) concludes that it is the onset rather than the offset of aversive stimulation which is critical in response suppression, and it is probable that avoidance of an aversive auditory stimulus may form an important component of conditioning treatment. Clinical experience at the Vale Drive clinic, where the present study was conducted, suggests that aversion to the auditory alarm stimulus may vary markedly from one patient to another, and it is conceivable that the extent to which therapeutic effect may be predominantly attributable to a process of passive avoidance conditioning varies also.
Crosby: A variant of foregoing conditioning paradigms has been provided by Crosby's (1950) use of electrical rather than auditory stimulation. Crosby, who comments that nocturnal wetting may become conditioned to various inappropriate and adventitious stimuli such as household sounds, light and minor physical disturbances, or may occur regularly and repetitively as the result of regular "lifting" to pass urine, regards treatment as producing raised inhibitory bladder tone and extinguishing inappropriate micturition responses where present. Using genital detector electrodes (contained in a penile sheath or a pad in the vulval clef), Crosby employed shock electrodes against the skin of the loin or lateral abdominal regions to reinforce the natural increase in bladder control which he considers to result from innate aversion to the "somatic discomfort" of the wet state. Since a buzzer and light was also included in the alarm apparatus (to summon an attendant), the technique merely adds an electric shock to the basic Mowrer-type auditory alarm. There is however no evidence that the use of shock stimuli or of genital detector electrodes, both of which are less acceptable than the standard type of alarm, affords any therapeutic gain (Lovibond, 1964).

The operant paradigm: Atthowe (1971) has reformulated the conditioning treatment of enuresis in operant terms, regarding retraining by means of classical counterconditioning alone as an inadequate description of the treatment process. He points to the possible instrumental effects of rising, shutting off the enuresis alarm and visiting the bathroom, all of which are disruptive and thus probably aversive, and all of which are contingent upon wetting during the period of treatment. Enuresis alarm treatment may thus be conceptualized as increasing the behavioural
"costliness" of bedwetting to the patient, reduction in wetting frequency producing a consequent reduction in the cost of the aversive regimen; Atthowe suggests that such a reduction may be more reinforcing than a programme of rewards alone. He further suggests that the maintenance of a treatment effect following the initial arrest of enuresis may be reliant upon the social reinforcers operative in the child's normal environment. Considering the normal range of alarm stimuli employed as probably of insufficient intensity to suppress the powerful involuntary micturitional reflex in the majority of children (a suggestion which merits further investigation), Atthowe hypothesized that the alarm stimulus may be regarded as essentially a discriminative stimulus facilitating the child's discrimination between the differentially reinforced responses of wetting and of inhibiting the micturition reflex or waking in time to avoid the greater disruption consequent upon an alarm triggering. The operant reformulation of the conditioning treatment of enuresis suggested by Atthowe involves consideration of the enuresis alarm as fundamentally a feedback device signalling, and precipitating, a chain of mildly aversive events, rather than as primarily an aversive stimulus or a means to suppression of the voiding reflex.

The behaviour therapy literature contains numerous small scale studies and case reports in which dramatic improvements in inappropriate defecation behaviour have been obtained by the systematic application of appropriate reinforcement contingencies, the reinforcers including food, sweets, drink, time off a ward, bath-play and relief from dishwashing, together with aversive consequences such as isolation and restraint (Ellis, 1963; Neale, 1963; Gelber and Meyer, 1965; Keehn, 1965; Marshall, 1966;
Lai and Lindsley, 1968; Barrett, 1969; Tomlinson, 1970; Edelman, 1971). Pumroy and Pumroy (1965) have published an account of the successful bladder training of their own two children, using mints as reinforcers. An operant approach has been effectively employed with retarded children (Ellis, 1963; Van Wagenen et al., 1969), profoundly retarded adults (Azrin and Foxx, 1971) and an autistic child (Marshall 1966). Samaan (1972) reports a single case-study in which enuresis remitted following the "lifting" of the child with reinforcement of urination by chocolate and body touch.

More sophisticated toilet training schemes have utilized automated devices, such as a toilet bowl crossed by photoelectric beams to ensure reliable and contingent reinforcement of elimination (Watson, 1968), or training pants to signal reinforcement of urination or defecation on a discrimination hierarchy based upon proximity of the toilet (Van Wagenen and Murdock, 1966). Van Wagenen et al. (1960) have utilized a device signalling urination to facilitate toilet training by a "fading" technique; Azrin and Foxx (1971), using a similar technique with retarded institutionalized adults and giving edible and social reinforcers for continent behaviour, conceptualized toilet training as a complex operant reaction to social factors rather than as an associative reaction of motor responses to internal stimuli.

Although not primarily relating to enuresis, the evidence that an operant paradigm may be applicable to eliminative disorders and toilet training does indicate the validity of exploring such an approach in the treatment of enuresis. Utilizing an operant paradigm, Tough et al. (1971) succeeded in eliminating
enuresis within 22 nights in a multiply handicapped eight year old boy, no relapse occurring during an 18 month follow-up period. A delayed punishment technique was employed, an enuresis alarm triggered by the child but sounding in the mother’s bedroom signalling the mother to place the child in a bath of cold water, this aversive consequence being therefore contingent upon wetting, but applied some brief period after wetting had occurred. Dry nights were praised by the family at breakfast. Similar results were obtained for the normal four year old sibling of the experimental patient. Tough et al. interpret their tentative findings within an operant framework as indicative that a cold bath is a higher magnitude punisher than an alarm stimulus alone, both possibly operating as punishers.

The major implication of the study by Tough et al. (1971) is theoretical rather than practical, affording albeit limited support to an operant paradigm for the treatment of enuresis: the practical advisability of introducing a cold bath contingency into a treatment which already suffers heavily from non-cooperation and parental termination of therapy (see Chapter Four) is questionable. It is worthy of note in this context that the mother of the two subjects treated by Tough and his colleagues herself terminated the treatment of her second child. If the operant reformulation of standard conditioning treatment presented by Atthowe (1971) can be accepted as a valid approach, and an enuresis alarm functions basically as a discriminative stimulus, then it must be assumed that the routine sequelae of triggering the alarm are already quite effectively aversive in that a therapeutic response is normally achieved.
A practicable means of maximizing any instrumental learning effects of treatment, avoiding the possible counterproductive effects of cold baths in terms of cooperation, may be to increase the aversive consequences of wetting by insisting upon the more reasonable measure of a thorough wash before the child returns to bed. Many clinicians (e.g. Meadow, 1970; Dische, 1971) recommend rewards to be given for dry nights; common rewards are "stars" or praise (as used by Tough et al. 1971). Such positive reinforcers might be combined with a "wash yourself when you have wet" contingency in a practical evaluation of the operant aspects of treatment, emphasizing the differential reinforcement of wet and dry nights at less cost to the parents than the use of a cold bath contingency.

The present status of the evidence relating to alternative learning paradigms for the conditioning treatment of enuresis does not permit a "purist" view. It is quite conceivable that more than one paradigm may operate, that non-specific elements in the context of treatment may be of greater importance than is frequently considered (Baker, 1969; Turner, Young and Rachman, 1970, Atthowe, 1971), and that the exact processes by which a therapeutic response is achieved may differ from one case to another and may vary over time. Possibly the alarm stimulus combines the functions of a UCS for wakening and suppression of the micturition reflex, a relatively mild punisher and a discriminative stimulus. It may through classical conditioning invest the kinaesthetic stimuli associated with the onset of micturition during sleep with negatively reinforcing properties, while also through reflex sphincter contraction evoking responses appropriate to continent behaviour for subsequent reinforcement.
when spontaneously produced to avoid wetting. The latter concept of response evocation in an operant situation is akin to the use of suppositories, to induce defecation, which is then reinforced (e.g. Lal and Lindsley, 1968). If the disruptive events following an alarm triggering are indeed aversive, as Atthowe (1971) suggests, then spontaneous awakening to micturrate may be expected to be relatively more aversive than prolonged inhibition of micturition. The observation that the latter is the more common outcome of conditioning treatment (Jones, 1960b) may afford some support to Atthowe's suggestion, although other explanations of the phenomenon may be tenable and little is known about the incidence of spontaneous awakening in patients undergoing and following treatment.

In conclusion, it may be hypothesized that learning is the central process in the conditioning treatment of enuresis, but that the relevant learning process is probably highly complex and possibly variable.

The indirect manipulation of enuresis

Further to the above discussion of learning paradigms for the conditioning treatment of enuresis, the possibility that enuresis may be responsive to manipulation of apparently irrelevant aspects of a child's behaviour must be considered. Nordquist (1971), reporting the single case study of a five year old male subject, observed that the frequency of enuresis correlated directly with the incidence of "oppositional" behaviour when the latter was brought under experimental control by means of time out from reinforcement and differential parental reinforcement of cooperative and non-cooperative
behaviour. This observation was tentatively explained in terms of increased effectiveness of the parents as agents of positive social reinforcement contingent upon reduction in the child's non-cooperative behaviour, parents of "oppositional" children tending to possess low reinforcement value. Nordquist hypothesized a transfer from external discriminative bladder control learned under these conditions from parental prompting of diurnal voiding, to an increased responsiveness to detrusor tension. The use of an intrasubject replication design eliminates the possibility that enuresis underwent spontaneous remission, since suspension of the contingency management programme led to a reinstatement of baseline levels of bedwetting.

In addition to the conceptualization presented by Nordquist, three further explanatory hypotheses may be suggested: (1) that the observed functional relationship between enuresis and uncooperative behaviour may accord with the psychodynamic theory that enuresis may represent aggression against the parents, (2) that the reduction in intrafamilial stresses consequent upon control of "oppositional" behaviour may have facilitated the performance of learned continent behaviour, and (3) that the parents may have given positive reinforcement for dry nights and that such reinforcement may have exerted an ameliorating effect upon enuresis. With respect to the first hypothesis above, it would indeed be surprising according to psychodynamic theory if the establishment of operant control over one form of aggressive behaviour (namely "oppositional" behaviour) were to lead to a concomitant reduction in another form of aggressive behaviour (presumed in this context to be enuresis), as was observed.
Psychodynamic theory would rather predict a concomitant increase in one outlet of aggression when another is blocked.

Both hypotheses (2) and (3) may have contributed to the observed phenomena. The factor of drive reduction may be regarded as relevant only if the hypothesis that the reduction of drive may facilitate the performance of learned responses can be accepted in this context; such an effect has been postulated, although not adequately demonstrated, in the treatment of enuresis (Bostock and Shackleton, 1952; Young, 1963b). With respect to the possibility of direct positive reinforcement of dry nights, the subject's parents had been instructed as part of the operant management programme to give both strong social reinforcement and physical affection contingent upon desirable behaviours. In spite of Nordquist's statement "Of course, the parents were told to continue ignoring enuretic activity," it is unlikely that parents instructed in the management of problem behaviours by operant means, who had in all probability achieved a greater effectiveness as agents of social reinforcement for their child, would have completely resisted the temptation to apply these management skills to the problematical behaviour of bedwetting. Inasmuch as the parents of Nordquist's subject may have failed to comply with the request that they maintain total neutrality towards enuresis during experimental periods, his results may be hypothesized as due to direct operant control of enuresis rather than to manipulation of the secondary response class of oppositional behaviour.

Further therapeutic strategies

The majority of enuretics for whom treatment is sought receive one of a variety of drug therapies (discussed below). In addition
to drugs and the psychological approaches discussed above, there exists a wide range of additional therapies for enuresis, representing novel theoretical assumptions, the results of empirical observation, or variations of established techniques. Entertaining papers have been written on historical approaches to the treatment of enuresis by Glicklich (1951) Bett (1953) and Salmon (1971). The occasional success of many strange approaches fashionable in the past may be due to the translation of latent learning into performance by the operation of a novel incentive, or to placebo and expectancy effects.

Many present day therapies have historical antecedents; today's prescription of posterior pituitary gland snuff (Disipidin) for its antidiuretic properties is, for instance, the logical sequel to ancient organotherapies involving ground hedgehog flesh, cock's trachea, hedgehog or hare testicles, pig's bladder and goat's claws. The forerunner of today's perineal pressure apparatus (Vincent, 1964) may perhaps be found in the nineteenth-century use of inflatable india-rubber bags to compress the bladder neck and upper urethra of enuretic girls. Time-honoured techniques such as preventing children from sleeping on their backs and of elevating them at angles to the horizontal have their present day advocates; Arnold (1970), for instance, recommends defiance of gravity by elevating a child's legs for half an hour prior to the final voiding of the day to restrict bladder filling.

Behavioural formulations also have their clear forerunners; an interesting early example of what would today be termed mild aversion therapy is to be found in the "Practice of Physick" by Riverius, published in 1661, where it is suggested that enuretic children who dream of urinating in inappropriate places should be
treated by "adorning those places which they dream they piss upon, with some costly things, and showing them often" (Bett, 1953). The use of enuresis alarms dates from 1830, when Nye suggested the use of faradic stimulation triggered by the child's urine wetting a sponge (Glicklich, 1951).

It is unfortunate that the deliberate and systematic ridicule of the enuretic child which has occurred so frequently in the past remains widespread in its persistence, in spite of greater understanding of the condition.

Historical "cures" which have, thankfully, fallen into disuse are those mechanical devices designed to forcibly prevent the passage of urine or even to seal the urethra - to which the male physiology rendered the enuretic boy particularly at risk.
Possibly most cruel was the practice of painfully increasing urethral sensitivity by cauterization with silver nitrate or the application of cantharides. Mention must also be given to the most famous of all treatment; the use of the dandelion, which has long enjoyed an unmerited reputation as a remedy for enuresis.

Drug therapies: Numerous drugs and pharmacological preparations are in current use in the treatment of enuresis (Blackwell, 1971). Drugs of the anticholinergic groups are frequently prescribed to depress the activity of the parasympathetic nervous system, thus lowering the sensitivity of the bladder to intravesical pressure and thereby increasing functional bladder capacity. Commonly prescribed anticholinergic drugs include isopropamide (Tyrimide), hyocyamus, (belladonna), methantheline (Banthine) and propantheline (Pro-Banthine). Used alone, none of these preparations constitute an adequate treatment of enuresis (Young, 1969). Similarly,
results of treatment by the use of posterior pituitary snuff (Disipidin) prescribed as a countermeasure to a presumed undersecretion of the antidiuretic factor and administered by insufflation, are disappointing (Young, 1969).

Salmon (1971c) has reported favourable results from the daytime use of Librium (chlordiazepoxide) in a series of primary enuretics over a period of six to nine months. It was suggested that this effect might be due to both a mood change tending to overcome emotional stress, and to the tendency of Librium to "normalize" an immature EEG pattern. Unfortunately, the effects of discontinuing the drug are not known.

One of the most commonly prescribed drugs in the treatment of enuresis is imipramine (Tofranil), although its precise mode of action remains uncertain. Petersen and Andersen (1971), in a recent trial, conclude that its effect is chiefly anti-depressive, with an anticholinergic element. It is conceivable that levels of stress may be temporarily reduced by prescription of an anti-depressant drug, thus possibly tending to facilitate the performance of partially learned responses. MacLean (1960) first suggested the routine use of imipramine in cases of enuresis, and underlined its major drawback; a virtually total relapse rate on withdrawal of the drug. A large number of subsequent controlled studies have confirmed the usefulness of imipramine in the temporary reduction of wetting, but also its failure to produce an effect capable of persisting after the drug is withdrawn (Mariuz and Walters, 1963; Alderton, 1965; Meijer, 1965; Drew, 1966; Shaffer, Costello and Hill, 1968; McConaghy, 1969; De Jonge, 1971; Kolvin et al., 1971; Petersen and Andersen, 1971) Noack (1964), from an uncontrolled study, concludes that imipramine may
usefully be prescribed to control enuresis while the child "matures" - although this seems to be a somewhat ineffective therapeutic strategy. Hägglund and Parkkulainen (1964) report a cystometric study in which the use of imipramine served to increase functional bladder capacity. It is possible that gradual withdrawal of the drug may permit a greater stability of cure; Poussaint and Ditman (1965) claim continued continence in 24 per cent of their patients for between one and three months after gradual drug withdrawal. Shaffer, Costello and Hill (1968), however, have contradicted this conclusion with a report of rapid relapse regardless of the rapidity of drug withdrawal.

Although it would seem established from the available data that imipramine may temporarily suppress enuresis, its viability as a major therapeutic approach to the problem of enuresis is dubious. The drug would, however, appear to be useful in two limited respects; firstly to control wetting for brief periods, such as holidays, when other forms of treatment may be inappropriate, and secondly to reduce the frequency or severity of wetting where this is desired as an adjunct to other forms of therapy.

Young (1965) has reported the results of drug therapy for a series of 273 children. The drugs prescribed were: posterior pituitary gland snuff (Disipidin), isopropamide (Tyrimide), a mixture of potassium citrate, hyoscyamus and belladonna, dexamphetamine sulphate (Dexedrine) and dexamphetamine sulphate-amylobarbitone (Drinamyl). In this trial of a range of drugs, the success rate was 36 per cent, with a relapse rate of 28 per cent found upon follow-up for one year. Using conditioning treatment at the same clinic, the same author reported a success rate of 65 per cent with a relapse rate of only 13 per cent.
Similarly, McConaghy (1969) has found conditioning to be significantly superior to treatment with either imipramine or amphetamine, provided that adequate parental cooperation could be secured.

Adjustment of sleep level: Bostock (1958a; 1958b; 1962) has postulated a "deep sleep - enuresis" syndrome as causative of enuresis. Noting that enuretics appeared more difficult to awaken fully, and less likely to stir at a stimulus than did non-enuretic controls, he recorded the time taken for seven enuretic and twelve non-enuretic boys to awaken to an auditory stimulus of 700 to 2,000 cycles per second at 30 to 50 decibels. The enuretics took an average 418 seconds to awaken, while the non-enuretics took an average of 319 seconds, suggesting a strong relationship between enuresis and deep sleep. These findings led Bostock to hypothesize a period of "exterior gestation" in man, dictated by evolutionary requirements, and lasting for approximately eight months after birth, until the infant becomes capable of independent locomotion. During this exterogestatory period, sleep is regarded as the norm of infantile activity, until the period is terminated by the onset of a more mature elective sleep pattern. Bostock regards overstimulation of the neonate by early toilet training or excessive handling as disruptive of deep sleep, which thus persists after the exterogestatory period as the immature deep sleep pattern implicated in the aetiology of enuresis. Acceptance of the deep sleep formulation suggests the treatment of enuresis by the use of "alerter" drugs such as amphetamine sulphate to lighten sleep, combined with awakening by an alarm clock present to the usual wetting times (Bostock, 1962; Bostock and Eckert, 1957). Such use of an alarm clock would seem
to be inferior to the use of an enuresis alarm through its sacrifice of temporal contiguity with wetting, and although CNS stimulant drugs may serve to sensitise a child to the auditory stimulus of an enuresis alarm, it has been suggested that this may involve personality factors related to conditionability rather than the type of syndrome suggested by Bostock (Young and Turner, 1965). The use of CNS stimulants during initial treatment has, however, been found counterproductive in terms of a higher relapse rate (Turner and Young, 1966).

Hallgren (1957) has also reported a correlation between deep sleep and enuresis, finding that 40 per cent of his nocturnally enuretic subjects were also deep sleepers, this incidence being higher than that among unaffected children. Although supporting Bostock's original findings, Hallgren does not regard deep sleep as causative of enuresis, but as a concurrent factor. Working with adult subjects, Ström-Olsen (1950) has reported frequent deep sleep and over-sleeping in enuretics, also recommending the use of amphetamine in therapy to lighten sleep.

Subsequent investigation of depth of sleep among enuretics has been carried out by Boyd (1960). 100 enuretics, together with non-enuretic controls, were woken on three consecutive nights by a standard waking stimulus; the spoken name of the child together with a hand on the left shoulder. Boyd noted no significant correlation between depth of sleep and EEG abnormalities, and concluded that unusually deep sleep is not a factor in the production of enuresis. She also commented that any effect of amphetamine on enuresis may be more properly ascribed to direct action on the bladder musculature rather than to any effect upon sleep levels. In any case, the actual therapeutic value of
The assessment of a possible relationship between depth of sleep and enuresis by means of observing reactions to waking stimuli is of necessity somewhat crude. Various authors have studied both the sleep patterns of enuretics and the cortical activity related to the actual occurrence of nocturnal enuresis by means of electroencephalography. In a study of eight enuretic boys, whose EEG's were recorded during sleep, together with electromyographic recording of eye movements, Pierce and his colleagues (Pierce et al., 1961) observed an EEG trace indicative of deep sleep during wetting. They also reported that dreaming (indicated by rapid eye movements recorded by the electromyograph) rarely occurred in conjunction with wetting, concluding that dreaming occurred typically during light sleep, and enuresis during deep sleep. They suggest that light sleep should benefit the enuretic, whom they found to be very difficult to awaken immediately after wetting, by permitting dreaming activity as a substitute for enuresis.

Ditman and Blinn (1955) have stated that enuresis occurring during deep sleep seems to be limited to childhood, finding that among male naval recruits, wetting was accompanied by an almost wakeful EEG pattern. These results are in direct contradiction of Strom-Olsen's (1950) impression of deep sleep among enuretic adults. Ditman and Blinn also noted other forms of increased body activity immediately prior to wetting, evidenced by increased heart rate, muscle tension, and psychogalvanic skin response. These authors, however, suggest interpretation of this increased activity in terms of "psychiatric struggle" indicating a psycho-
pathological state in older enuretics. Such interpretation would seem to be an unnecessary elaboration of the physiological activity occurring during a period of near wakefulness.

Investigating the possibility of EEG abnormalities among enuretic children, Fermaglich (1969) reported 15 of 39 EEGs to be unequivocally abnormal, 13 of these suggesting the early stages of a convulsive disorder. Unfortunately, no control group was included. In another study of child and adolescent enuretics (Turton and Spear, 1953), 28 per cent were considered to have an immature EEG pattern, and 22 per cent to have a pattern showing epileptiform features. However, there is no known relationship between childhood enuresis and subsequent manifestations of convulsive disorder, and Ditman and Blinn (1955) and Salmon (1971b) have reported the absence of a relationship between enuresis and epilepsy. Salmon (1971b) has reported minor EEG abnormalities, indicating mainly maturational delay, particularly where enuresis is of the primary type.

Although the evidence is contradictory, it would seem that there is no clear relationship between enuresis and either EEG abnormality or unusually deep sleep. Graham (1971), reviewing the relevant literature, concludes that enuresis may occur at any stage of sleep, but that the available evidence is sparse. Wetting has been reported as occurring at various levels of sleep, but possibly and not surprisingly, being accompanied by greater cortical activity in adults than in children, bladder tension in the latter perhaps leading to a more automatic voiding response with less concomitant disturbance of sleep. As Hallgren (1957) has concluded, deep sleep in enuretic children is probably a concurrent, but not a causative, factor. Furthermore, it would
be difficult to accept deep sleep as being of aetiological significance in enuresis of the secondary type. It is probable that the slight effect of amphetamines upon enuresis is not due to any effect upon sleep levels (Boyd, 1960; Young, 1969), but to their facilitative effect upon conditioning (Young and Turner, 1965).

**Perineal pressure:** Vincent (1964) has postulated that since micturition probably commences with a descent of the bladder neck, an artificial raising of the bladder neck by means of pressure applied to the perineal region should inhibit premature micturition and prove of therapeutic value in cases of "irritable bladder," where enuresis is accompanied by micturitional urgency and frequency. This technique is similar to the "curtsy," whereby some children find that they can avoid wetting themselves by "heel sitting" - the application of perineal pressure by sitting on the heel also seems to form a part of the "lotus posture" of oriental contemplatives (Vincent, 1966; De Jonge, 1971). Vincent suggests the use of a perineal pressure apparatus, in which an inflatable balloon is strapped against the perineum, partly as a diagnostic aid and partly as a demonstration of the efficacy of raising the perineal floor, which is subsequently achieved by exercises and electrical stimulation without the pressure apparatus. Vincent rejects the concept of small bladder capacity as irrelevant in the majority of cases of "irritable bladder," describing the syndrome as chiefly determined by inefficiency of the perineal floor musculature permitting easy descent of the vesical neck. Vincent states, however, that treatment with the perineal pressure apparatus is less effective in enuretic children without diurnal
abnormalities of urinary function, and is inferior to condition­
ing treatment in such cases. The comment is also made that
nocturnal wetting can occur in spite of the fact that the patient
may be wearing the pressure apparatus, possibly because the
wetting is then a positive act rather than a relaxation of the
sphincters. It would be reasonable to conclude that, inasmuch as
enuresis accompanied by diurnal urgency and frequency of
micturition involves the component of lack of perineal muscle
tonus, the apparatus Vincent describes may be useful in the improve­
ment of that tonus. This component is, however, likely to be of
little significance in cases of "true" nocturnal enuresis, without
diurnal urgency and frequency, and in the genesis of secondary
enuresis.

Exercises in "holding": In common with the additional treatment
strategies discussed above, "holding" exercises, whereby the
patient is required to retain urine for longer periods than usual,
are frequently advocated but have received little systematic
evaluation. Assuming, from cystometric evidence, that the enuretic
possesses an "immature" bladder with a small functional capacity,
it is suggested that this capacity should be increased by
instructing the child to increase his fluid intake and to post­
pone voiding for as long as possible - a process which may be
aided by the prescription of anticholinergic drugs, and which
should be continued to the point of overcorrection to ensure
permanence of cure (Muellner, 1960).

Starfield (1967) has provided a theoretical foundation for
the use of holding procedures, based upon the finding, from a
comparison of 221 enuretics and 203 non-enuretic sibling controls,
that the mean functional bladder capacity of the enuretics was
significantly lower than that of the controls. An initial success rate of approximately one third was achieved by means of holding exercises extending over a six month period (Starfield, 1972).

Ellison Nash (1949) claims a 90 per cent success rate in "a few weeks" by requiring the child to void every quarter of an hour, this period being gradually extended to two hours, and Gairdner (1965) suggests "ritual voiding" at gradually lengthening intervals, together with exercises described as "the higher flights of vesical acrobatics" - i.e. counting to ten before commencing to micturate, and practice in stopping and starting the urinary stream. Kimmel and Kimmel (1970) report the success of "shaping" bladder control by means of daytime holding exercises in three cases of nocturnal enuresis, and advocate the positive reinforcement of increased ability to postpone micturition beyond the first impulse to void. It is unfortunate that these latter authors display a misconception of conditioning treatment as the introjection of consciousness into a reflex act of voiding which can do no more than substitute nocturnal frequency for enuresis, ignoring the probable effects upon detrusor tone of reciprocal inhibition of micturition when an enuresis alarm is used.

The treatment of nocturnal enuresis by exercises in holding, although of use in increasing the low-volume tolerance of the bladder, is probably of most use in the treatment of diurnal urgency and frequency of micturition. The treatment of nocturnal wetting by an attack upon diurnal symptoms that by no means always accompany enuresis, is a somewhat indirect approach and is unlikely to prove as effective as the more direct conditioning techniques afforded by the use of an enuresis alarm. Diurnal training in bladder tolerance may however provide a useful adjunct to
conditioning treatment where diurnal symptoms accompany nocturnal wetting.

Lovibond (1964) has suggested that by requesting a child to hold at night after triggering an enuresis alarm, it might be possible both to increase the rate of reinforcement and to gain the benefits of holding practice. Observation of a single 13 year old male subject indicated that the inhibition of micturition consequent upon a brief electrical or auditory stimulus, triggered by an automatically resetting electrode incorporated in a penile sheath, could persist for periods of 30 to 120 minutes while the child returned to sleep. This spacing of reinforcements might be sufficient to preclude the potentially deleterious effect of the "massing" of reinforcements. Although an interesting elaboration of normal conditioning therapy, Lovibond's experiment was limited to a single case and he does not report any effect upon the severity of the child's enuresis.

Fluid restriction and "lifting": Parents very commonly attempt to avoid the problem of wet beds either by reducing the child's fluid intake (often banning drinks after a certain hour), or by "lifting" - awakening the child to urinate at a certain time each night. Fluid restriction is inadequate as a treatment because it exerts no influence whatever upon functional bladder capacity, and in many cases cannot reduce the quantity of urine produced at night sufficiently to overcome the characteristic tendency of the enuretic to micturate at very low bladder volumes, nor the sensitivity of the bladder receptors to highly concentrated urine (Jones, 1960b; Gairdner, 1965). The practice of lifting seems to have some value in the toilet training of infants, but its extension as a treatment for enuresis is unwarranted.
(Jones, 1960b: Gairdner, 1965; Young, 1969). It is often supposed that by regularly awakening an enuretic child, the accumulation of sufficient volumes of urine to initiate reflex micturition may be forestalled and a waking stimulus conditioned to moderate bladder pressures. However, not only is learning related to a narrow range of moderate bladder pressures inefficient (Young, 1964a), but it may merely serve to maintain low thresholds for reflex micturition (Crosby, 1950; Jones, 1960b; White, 1968). By recording the nocturnal pattern of micturition in enuretics, clear evidence of a repetitive pattern of micturition resulting from conditioning to a specific interval of time may be obtained when a patient has been lifted (Crosby, 1950). Although immensely popular among parents, neither fluid restriction nor lifting can be considered valid therapies for enuresis; at best, they may reduce the wet sheets to be washed without establishing any degree of bladder control in the child, and conceivably lifting may do this at the expense of conditioning in the child a time-determined wetting response in addition to his inability to inhibit reflex micturition.

"Staggered wakening:" In an attempt to overcome the limitations of regular lifting, Young (1964a) has proposed that enuretics be woken at different times each night, hypothesizing that a waking response should thus be conditioned to a wide range of bladder pressures, stimulus generalization permitting the development of a strong association between bladder pressure and waking. In a clinical trial of the technique, 18 of 76 subjects terminated treatment before the completion of the trial, and 67.2 per cent of the remaining 58 subjects showed a marked reduction in wetting frequency. The initial cure rate was, however, only 17.2 per cent
and full follow-up data are not available. The technique is severely handicapped in that it solely conditions a waking response to bladder pressures below the threshold for reflex voiding, and does not involve the conditioning of inhibition of micturition to the stimuli immediately preceding reflex urination. As Young comments, staggered-wakening is much inferior to more direct conditioning methods, but may provide a mode of toilet-training of infants which is preferable to regular lifting.

Summary

Problems of definition are discussed, and enuresis nocturna is defined as "persistent and frequent urination during sleep at an age at which nocturnal bladder control is considered to be normal." Primary and secondary types of enuresis are differentiated. Phenomena of incidence are discussed, including the age/incidence gradient, the predominance of boy enuretics, the social class bias and familial incidence. The association of enuresis with other disorders of eliminative function, with aspects of developmental delay and with genitourinary lesion is considered. An account is given of the physiology of micturition and of the development of normal bladder control.

Enuresis is presented as an independent disorder, frequently occurring co-incidentally with psychiatric disorder but logically treatable as a separate entity. The concept of enuresis as primarily an expressive symptom is considered and rejected. The disorder is discussed in relation to learning theory and is hypothesized as a learning deficit, a tentative aetiological model being presented. Conditioning treatment is described and data are presented suggesting an initial success rate of 81 percent in arresting enuresis. "Overlearning" is presented as a
possible countermeasure to the major problem of relapse.
Objections to symptomatic treatment of enuresis, founded upon predictions of symptom substitution and deleterious effects upon general adjustment, are found to be largely unsupported. Various learning paradigms are discussed, including classical, avoidance and operant conditioning formulations, and the conclusion is drawn that the exact processes involved in producing a therapeutic response may vary both between cases and over time. Various additional forms of treatment and management are considered, including drug therapies and the common parental procedures of "lifting" and fluid restriction, and are where possible evaluated from empirical data.
2. THE PRESENT STUDY

Aims and problem definition

In the clinical treatment of enuresis, therapy cannot justifiably be considered successful if in any case where referral is accepted by the parents a stable remission of enuresis is not subsequently achieved, or if therapeutic response is extremely slow. Therapeutic failures may indicate either an inadequacy in the process of treatment itself, or may comprise instances of breakdown in the requisite collaboration between clinic team, patient and parents sufficient to culminate in the rejection of treatment. Both categories of failure represent a wastage of limited therapeutic resources, and both reduce the favourability of prognosis at the referral stage.

The present study is designed to investigate therapeutic problems occurring in the practical clinical setting of an enuresis clinic. The staff of the Vale Drive clinic, in which the study was conducted, accept a learning theory approach to enuresis; conditioning therapy is thus the treatment of preference, although not employed in every case and frequently supported by or alternated with other forms of therapy. The study is therefore concerned with the success and failure of a composite therapeutic approach at a clinic having a strong behaviouristic orientation, rather than with the field evaluation of a specific therapeutic procedure.

The aims of the present study are:
(1) to extend knowledge of the factors associated with therapeutic success and failure in the treatment of enuresis at a behaviourally oriented clinic;
(2) through the identification of factors associated with failures
in therapeutic outcome, to indicate prognostic criteria which may be of relevance to the more effective deployment of therapeutic resources.

Four major areas of therapeutic failure were identified for study at the Vale Drive clinic, and are defined below.

**Non-attendance:** Non-attendance was defined for the purposes of the present study as failure to attend the clinic once an appointment had been given. Among one series of cases investigated retrospectively in the study, 17 (7.4 per cent) from a total of 229 referrals were not completed because the parents failed to reply to correspondence requesting the name and address of their general practitioner, so that his permission for treatment could be sought. Among the remaining 212 cases, where referral was accepted by the parents, failure to attend the initial appointment was held to constitute non-attendance.

**Termination:** For the purposes of the present study, termination was defined as withdrawal of a patient from treatment either by notification that no further appointments were desired, or by failing, without cancellation, three consecutive appointments. Satisfaction of either of these criteria results at the Vale Drive clinic in the closure of a case, the only other means by which a case may be closed being discharge on attaining remission of enuresis.

**Slow therapeutic response:** Slow response was defined in the present study as a treatment duration of 32 weeks or more. Such a criterion of slow response is purely arbitrary, and represents the slowest quartile of the distribution of treatment durations (measured in complete weeks) among the retrospectively studied series of the investigation. To regard the rate of therapeutic
response in patients satisfying this criterion as being unacceptably slow would appear generous, since in the literature, three months, 90 days or 50 alarm triggerings have variously been regarded as cut-off points for therapeutic failure.

Relapse: In the present study, relapse was considered to have occurred if a standard reply-paid follow-up enquiry elicited a reply reporting a recurrence of enuresis of sufficient severity to cause the parent to accept the offer of further treatment at the clinic. Follow-up enquiries were, according to established clinic practice, sent to the parents of discharged cases three months following discharge, six months following discharge, and at subsequent six month intervals.

For practical reasons it was not feasible to select an arbitrary frequency of renewed wetting to constitute a relapse criterion: some parents requested re-treatment following what could reasonably be termed an "occasional accident", others failed to supply follow-up information for a prolonged period and then reported a spontaneous recovery from a relapse occurring some months previously, permitting no accurate assessment of wetting frequency. Some parents requested re-treatment by telephone, there being therefore no record available of wetting frequency prior to re-attendance at the clinic. The fact of a further appointment being offered emerged as the only practically applicable objective criterion of relapse. It should be noted, however, that where a follow-up reply was received in which the parent did not request further treatment although this appeared necessary, it was normal for the clinic staff to make further investigations. Throughout the relevant literature may be found evidence of the necessarily arbitrary nature of any definition
of relapse, reflected in wide variations in reported relapse rates (see Chapter Six).

The special investigation clinic

The present research was conducted at the Vale Drive clinic, a special investigation clinic provided under the 1944 Education Act by the Health Department of the Council of the London Borough of Barnet. The purpose of the clinic is the study and treatment of childhood enuresis and encopresis. Two half-day clinic sessions are held weekly, at a health centre situated in the northern part of the Borough, where a variety of other health services are also available. The special investigation clinic opened in July 1967, and the present investigator worked at Vale Drive from December 1970 to December 1972.

Treatment is provided at Vale Drive for children of school age, although referrals are accepted in respect of four year olds. Children are typically referred to the clinic by school medical officers following routine school medical inspections. Provided that no objection is received from the child's general practitioner, each referred case is placed on the waiting list for a first appointment, up to four new cases being offered a first appointment at each clinic session.

On arrival for his initial appointment, the child is weighed and measured and a vision test is conducted. A midstream specimen of urine is taken for examination at the clinic, a similar specimen being sent to a local hospital for full biochemical and bacteriological examination. A full medical and social history is then taken, and an audiometric test performed, after which the child undergoes thorough medical examination. In
addition to investigating the possibility of urinary infection or urogenital disorder, these investigations permit the discovery in many cases of hitherto undiagnosed disorders, together with subsequent referral to the appropriate clinic or notification to the general practitioner.

The predominant form of treatment employed at Vale Drive is conditioning therapy using a Mowrer type of enuresis alarm, triggered by means of a pair of gauze detection mats. The therapeutic approach is, however, composite and includes, where considered appropriate, the use of drugs alone or in conjunction with an enuresis alarm, and periods of record-keeping in the absence of specific treatment. The alarms used are principally from the "Eastleigh" range, but also include various research instruments designed for investigation of the efficacy of various auditory stimuli.

The use of the enuresis alarm is fully demonstrated at the clinic and full instructions are given. Parents are requested not to "lift" their children, and not to impose any restrictions upon fluid intake. Patients are required to attend the clinic regularly, normally at fortnightly or monthly intervals, when their progress in treatment is reviewed by any one of three therapists. The battery voltage of the alarm is tested at each visit and the batteries renewed as necessary in order to maintain the stimulus at a constant level. Parents are required to

---

maintain a chart of wet and dry nights throughout treatment.\(^{(1)}\)

Prior to the present investigation, it had been clinic policy to allocate an unselected sample of patients to overlearning therapy, as an untried technique hypothesized as being of potential value in the reduction of the relapse rate (see Chapter Six). The efficacy of this technique was demonstrated by analysis of the retrospective data of the present study, and the results reported in Chapter Six were published (Young and Morgan, 1972c). A confirmatory study, involving a large sample outside the present investigation and a longer follow-up period, was subsequently conducted (Young and Morgan, 1972d). In consequence of these findings, it became clinic policy from late 1971 to allocate every suitable case to overlearning therapy - a change in policy which thus affected most patients comprising the series studied in the "concurrent phase" of the present research (Chapters Eight to Ten).

\(^{(1)}\)Certain investigators have reported cases of electrolytic burns resulting in cutaneous "buzzer ulcers" occurring in enuresis alarm use (Gillison and Skinner, 1958; Coote, 1965; White, 1968; Lovibond and Coote, 1970), and the Ministry of Health (1968) have issued a performance specification for enuresis alarms. No case of "buzzer ulcers" has, however, ever occurred among Vale Drive patients; a finding confirmed by Dische (1971) in a report of clinical treatment. Coote's (1965) findings suggest that the chief cause of ulceration may be the use of a detector pad design in which both electrodes are bonded to the surface of a single pad either interwoven or concentrically coiled, permitting simultaneous contact with both electrodes (Davidson and Douglass, 1950; Seiger, 1952).
Treatment is provided at the clinic for as long as may be necessary to achieve remission of enuresis, no patient being discharged as a therapeutic failure. The criterion for discharge is the attainment of 14 consecutive dry nights, following the initiation of the overlearning regime where this is prescribed as the concluding stage of treatment.

Organization of the study

The present research was conducted in two phases. An initial "retrospective phase" involved the investigation of patient, background and treatment data available from clinic records, in order to identify any factors associated with the previously defined areas of therapeutic failure. Certain common prognostic assumptions were also evaluated. The second, "concurrent," phase involved the ongoing study of patients in treatment to elaborate and evaluate hypotheses generated by the retrospective phase. The concurrent phase included assessment of parent and patient attitudes regarding enuresis and their expectancies of therapeutic outcome and of relapse. Parents were also interviewed in cases of non-attendance and termination.

The retrospective phase

Choice of the sample: The sample of patients studied in the retrospective phase comprised all patients referred to the Vale Drive clinic during 1969. The relevant data were analysed as they existed on 12th May 1971. The selection of a one-year cohort afforded adequate sample sizes and avoided the possibility of sampling biases; 1969 was regarded as a suitable year since it permitted a reasonable follow-up period for the majority of subjects, while minimizing the problems presented by the inclusion of cases still in treatment at the time of data collection. Such cases could not be entirely eliminated even by the choice of the
year 1968 - and since the clinic opened in the latter half of 1967, it was considered unwise to study patients treated in the early stages of the clinic's development, when its procedures were less typical of those presently employed. All cases referred in 1969 and still in treatment in May 1971 had been in treatment for at least 56 weeks and could thus be considered slow responders (the criterion of slow treatment response being a treatment duration of 32 weeks or more). The choice of the 1969 cohort thus avoids the exclusion from the slow responding group of subjects who at the time of data collection had not satisfied the criterion of slow response, but who might have done so subsequently. It was necessary to exclude from the analyses relating to termination (Chapter Four), the 16 patients whose clinic attendance had been concluded by neither discharge nor termination, and who were thus still attending the clinic at 12th May, 1971.

Nature of the sample: Referrals to the Vale Drive clinic during 1969 totalled 236. Seven cases were excluded from analysis on the grounds tabulated in Table four.

<table>
<thead>
<tr>
<th>Grounds for exclusion</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known to have left the district</td>
<td>4</td>
</tr>
<tr>
<td>Referred for encopresis alone</td>
<td>2</td>
</tr>
<tr>
<td>Under treatment elsewhere (clinic attendance therefore discontinued)</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 4: Cases excluded from analysis (retrospective phase)

Of the 229 remaining referrals, the parents failed to supply the name and address of their general practitioner when requested in
Figure 4. Distribution of Referrals by age.
17 cases (7.4 per cent). Only the remaining 212 cases can be regarded as accepting referral. Table five presents the subsequent outcome for these cases, as on 12th May 1971.

<table>
<thead>
<tr>
<th>Category</th>
<th>Cases</th>
<th>Percentage of all cases accepting referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-attendance</td>
<td>38</td>
<td>17.9%</td>
</tr>
<tr>
<td>Entered treatment</td>
<td>174</td>
<td>82.1%</td>
</tr>
<tr>
<td>Termination</td>
<td>50</td>
<td>23.6% (31.6% of closed cases)</td>
</tr>
<tr>
<td>Slow response</td>
<td>32</td>
<td>15.1% (25.0% of cases treated)</td>
</tr>
<tr>
<td>Discharged</td>
<td>108</td>
<td>51.0% (68.4% of closed cases)</td>
</tr>
<tr>
<td>Relapsed</td>
<td>26</td>
<td>12.3% (24.1% of cases discharged)</td>
</tr>
<tr>
<td>In current attendance</td>
<td>16</td>
<td>7.5% (9.2% of cases treated)</td>
</tr>
</tbody>
</table>

(1) Two patients who terminated contact with the clinic having achieved continence renewed their attendance almost immediately on experiencing relapse. These cases are excluded from the "terminator" group.

(2) The categories of "slow response" and "discharged" are not mutually exclusive.

Table 5: Outcome for cases accepting referral during 1969

Referrals to the Vale Drive clinic reflect the preponderance of boys among the enuretic population (see Chapter One), boys outnumbering girls in the ratio of approximately two to one. Of the 212 cases accepting referral during 1969, 134 were boys and 78 girls. Table six presents the sources from which referrals were received during the year. The mean period spent by cases accepting referral on the waiting list for an appointment was 14.5 weeks, with a range of 0 to 37 weeks. Fig. four presents the distribution by age of all patients referred during 1969 for whom information
<table>
<thead>
<tr>
<th>Referral source</th>
<th>Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>School medical officer</td>
<td>142</td>
<td>60.8%</td>
</tr>
<tr>
<td>Self referral</td>
<td>35</td>
<td>14.9%</td>
</tr>
<tr>
<td>General practitioner</td>
<td>34</td>
<td>14.5%</td>
</tr>
<tr>
<td>Health visitor</td>
<td>17</td>
<td>7.3%</td>
</tr>
<tr>
<td>Welfare department</td>
<td>3</td>
<td>1.3%</td>
</tr>
<tr>
<td>Education welfare officer</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td>Hospital</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td>(Data not available)</td>
<td>1</td>
<td>0.4%</td>
</tr>
<tr>
<td>Total</td>
<td>234</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 6: Sources of referral during 1969 (excluding two cases referred for treatment of enuresis only)

is available. It may be noted that peaks in the distribution coincide with the ages at which routine school medical examinations are normally conducted.

The model social class of patients entering treatment at Vale Drive is Registrar General’s Class III - Manual. Although these patients do not reflect the lower social class bias of the total enuretic population (see Chapter One), the sample may nevertheless be regarded as an unselected sample of the sub-population of enuretic children presenting for clinical treatment. Table seven shows the social class distribution of 1969 referrals entering treatment.

<table>
<thead>
<tr>
<th>Social class</th>
<th>I</th>
<th>II</th>
<th>III - Non-manual</th>
<th>III - Manual</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>14</td>
<td>46</td>
<td>14</td>
<td>69</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>Percentage</td>
<td>8.0%</td>
<td>25.4%</td>
<td>8.0%</td>
<td>38.2%</td>
<td>9.8%</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

NB: The fathers of seven patients were serving in H.M. forces, and information is not available in a further three cases from the total of 174 patients entering treatment.

Table 7: Distribution of patients entering treatment by social class.
Of the 174 patients entering treatment from the retrospective series, 150 (86.3%) were primary enuretics, and 23 (13.2%) were secondary enuretics, the latter having maintained continence for at least one year after the age of three years. Information was not available in one case. There was no sex bias in this division; 15 of the secondary enuretics were boys and eight were girls, closely reflecting the overall two to one predominance of boys among Vale Drive patients. The wetting frequencies of the children entering treatment; as estimated by the parents, is given in Table eight.

<table>
<thead>
<tr>
<th>Wet nights per week</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>6</td>
<td>14</td>
<td>9</td>
<td>20</td>
<td>25</td>
<td>24</td>
<td>75</td>
</tr>
<tr>
<td>Percentage</td>
<td>3.4%</td>
<td>8.1%</td>
<td>5.2%</td>
<td>11.5%</td>
<td>14.4%</td>
<td>13.8%</td>
<td>43.1%</td>
</tr>
</tbody>
</table>

NB: Information not available in one case

Table 8: Distribution of wetting frequencies

A positive family history of enuresis among parents or siblings was reported in 117 cases (67.7%) entering treatment. Sixty-nine children (39.9%) had undergone some form of unsuccessful treatment elsewhere before arriving at Vale Drive; Table nine shows the types of such treatment, and Table ten the sources from which it was obtained.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablets</td>
<td>31</td>
<td>17.8%</td>
</tr>
<tr>
<td>Medicine</td>
<td>24</td>
<td>13.8%</td>
</tr>
<tr>
<td>Enuresis alarm</td>
<td>15</td>
<td>8.6%</td>
</tr>
<tr>
<td>Chart-keeping</td>
<td>2</td>
<td>1.1%</td>
</tr>
<tr>
<td>Psychotherapy</td>
<td>1</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

NB: Some patients had received a combination of these therapies. Information is not available in one case.

Table 9: Types of previous treatment reported for retrospective phase patients
<table>
<thead>
<tr>
<th>Source</th>
<th>Cases</th>
<th>Percentage of cases previously treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>General practitioner</td>
<td>46</td>
<td>66.7%</td>
</tr>
<tr>
<td>Clinic</td>
<td>8</td>
<td>11.6%</td>
</tr>
<tr>
<td>Hospital</td>
<td>8</td>
<td>11.6%</td>
</tr>
<tr>
<td>Alarm borrowed from friends</td>
<td>3</td>
<td>4.3%</td>
</tr>
<tr>
<td>Unknown</td>
<td>4</td>
<td>5.8%</td>
</tr>
<tr>
<td></td>
<td>69</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 10: Source of previous treatment reported for retrospective phase patients

Thirteen patients from the retrospective series of 174 cases entering treatment were treated by alternative therapies to the enuresis alarm, in most cases because the child's frequency of wetting was considered insufficient to merit its use or because the child's home circumstances rendered its use impracticable. Table 11 presents the alternative therapies employed. In two cases, contact with the clinic was terminated by the parents before any treatment could be initiated.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs</td>
<td>9</td>
</tr>
<tr>
<td>Chart-keeping</td>
<td>3</td>
</tr>
<tr>
<td>&quot;Potting&quot;</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

Table 11: Alternative forms of treatment to the enuresis alarm

An enuresis alarm was employed in 159 (91.5%) of the 174 cases entering treatment. In 79 of these cases, drugs were also prescribed, frequently either as an adjunct to the use of an alarm, or during holiday periods spent away from home. Where a child was also encopretic, senokot was frequently prescribed to accompany training of the gasto-ileal reflex. The drugs prescribed to
retrospective phase patients are tabulated in Table 12.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tyrimide (isopropamide)</td>
<td>70</td>
</tr>
<tr>
<td>Methedrine (methylamphetamine hydrochloride)</td>
<td>24</td>
</tr>
<tr>
<td>Tofranil (imipramine)</td>
<td>19</td>
</tr>
<tr>
<td>Potassium citrate and hyoscyamus mixture</td>
<td>4</td>
</tr>
<tr>
<td>Senokot</td>
<td>3</td>
</tr>
<tr>
<td>Dexedrine (dexamphetamine sulphate)</td>
<td>1</td>
</tr>
</tbody>
</table>

NB: In many cases, different drugs were prescribed at different stages of treatment.

Table 12: Use of drugs for retrospective phase patients

Analysis of the sample: The following four comparisons were made of patients from the retrospective series, to test the hypotheses that cases falling into any of the four categories of therapeutic "failure" would be delineated by particular patient, background or treatment characteristics:

(1) non-attenders ($N = 38$) with those entering treatment ($N = 174$)

(2) terminators ($N = 50$) with those remaining in treatment until discharge ($N = 108$)

(3) slow responders ($N = 32$) with rapid responders ($N = 30$)

(4) relapsed patients ($N = 26$) with those not reporting relapse on follow-up ($N = 82$)

In addition to the above four comparisons (which are presented in Chapters three, four five and six respectively), factors hypothesized as being of possible relevance to the rapidity of termination and relapse were investigated (see Chapters five and six). The strategy of comparing extreme groups in (3) above was selected as having the greatest potential for the identification of factors associated with the rate of therapeutic response.
Since the "slow response" group comprised those cases falling into the arbitrarily selected longest quartile of the distribution of treatment durations, the contrasted group of "rapid" responders comprised those cases falling into the shortest quartile of the distribution of treatment durations (measured in complete weeks). The rapid response group thus comprised patients attaining the discharge criterion in 10 weeks or less. Because of the presence of current cases in the slow response group, it was not practicable to analyse the data in terms of correlations between treatment duration and the variables to be investigated.

The concurrent phase

The second, "concurrent," phase of the present study was commenced on completion of the retrospective phase, with the aim of closer evaluation of anxiety, attitude and expectancy variables hypothesized as being of possible relevance to therapeutic response. General hypotheses suggesting the possible relevance of these factors had been generated by the findings of the retrospective phase (see, especially chapters four and five).

Scales employed: Anxiety and attitude variables were investigated in the concurrent phase by means of five scales:

(1) the Child Concern Scale (CCS); a 20-item attitude scale constructed to assess the child's level of concern at being enuretic

(2) the Parent Intolerance Scale (PIS); a 20-item attitude scale designed to assess the mother's level of intolerance or tolerance of her child's bedwetting

(3) the Nuisance Value rating (NV); a list of 25 childhood problems on which the mother is requested to indicate those perceived as being worse than enuresis
(4) the Children's Manifest Anxiety Scale (CMAS); the children's version of the Taylor Manifest Anxiety Scale (Castaneda, McCandless and Palermo, 1956)

(5) the Willoughby Personality Schedule (WPS); a scale indicating the mother's level of manifest anxiety (Willoughby, 1932). This scale was also used in the retrospective phase. The WPS was selected for use in the present study as it was already routinely used at the clinic.

The CCS, PIS and NV were especially constructed for the present study. The complete scales, method of presentation and normative data, together with an account of the validation of the attitude scales (CCS and PIS) are given in appendices A, B and C respectively. The use of the scales is further discussed in chapters nine and ten.

Assessment of the pre-treatment expectancies was made by means of two simple five-alternative multiple-choice questions; the parent expectancy (PE) given by the mother and the child expectancy (CE) given by the patient. These questions and their instructions are reproduced in appendix D.

On discharge, mothers and children were asked to indicate their expectancy of relapse on a five-alternative multiple-choice questionnaire similar to the CE and PE. Parental relapse expectancy was assessed by the "PRE", and the child's relapse expectancy by the "CRE"; the questionnaires are reproduced in Appendix D. The findings relating to both pre-treatment expectancies and expectancies of relapse are presented in chapter eight.

Domiciliary visiting: When a patient failed to attend the initial appointment or terminated treatment (by notification that no
further appointments were desired, or by failing without cancellation three consecutive appointments), this fact was notified to the investigator, who then made a domiciliary visit as soon as was possible. If the reasons for non-attendance or termination had been notified to the clinic, the domiciliary visit was omitted, provided that sufficient data had been recorded. The information acquired by this programme of visits is discussed in chapter seven.

Investigation: The following specific investigations were conducted in the concurrent phase:

(1) investigation of the associations between attitudinal, anxiety and expectancy variables and certain background factors among the 153 cases first seen between 6th July 1971 and 4th May 1972 (see chapters eight, nine and ten)

(2) investigation, by means of domiciliary visits where necessary, of all instances of non-attendance (N = 70) and termination (N = 63) occurring between 6th July 1971 and 6th July 1972 (see chapter seven)

(3) investigation of the association between relapse expectancy ratings (on the CRE and PRE, described above) and the occurrence of relapse among the 149 patients discharged between 6th July 1971 and 6th July 1972 (see chapter eight)

(4) comparison of terminators (N = 35) with discharged cases (N = 92) among the 153 cases commencing treatment between 6th July 1971 and 4th May 1972, with respect to expectancy and attitudinal factors. The data were analysed as they existed on 7th December 1972 (see chapters eight, nine and ten)

(5) comparison of slow responding (N = 45) with rapid responding
(N = 25) groups with respect to expectancy, anxiety and attitudinal factors, these groups comprising all patients satisfying the relevant criteria who entered treatment between 6th July 1971 and 4th May 1972 (see chapters eight, nine and ten).

It should be noted that while the investigator was in no way involved in the treatment of retrospective phase patients, eliminating the possibility of experimenter biases, he was closely involved in the treatment of many concurrent phase patients. Since, however, the data analysed in the concurrent phase were collected prior to and during treatment, and the group membership of patients could not be determined until the outcome of treatment was known, it is doubtful whether therapeutic decisions made by the investigator could lend any bias to the results obtained. It should also be noted that the findings of the retrospective phase were available to all those involved in the treatment of concurrent phase patients.

Method of analysis

Nonparametric statistical techniques (Siegel, 1956) were employed throughout the present study, the choice of nonparametric analysis being largely dictated by the measurement of much of the recorded data at the nominal or ordinal levels only. Such analysis also affords the additional advantage of avoiding assumptions regarding the normal distribution of any variable. Where the data were appropriate, the chi-squared statistic for independent samples was employed, being corrected for continuity where the data could be cast into 2 x 2 contingency tables. The Fisher exact probability test was substituted where the frequencies in a 2 x 2 contingency table were insufficient to permit analysis by chi-squared. The Mann-Whitney "U" test, corrected for ties,
was employed to compare the medians of groups for variables measured at the ordinal level or above, and the Spearman Rank coefficient of correlation \( r_s \) was calculated where a test of correlation was indicated. The Kruskall-Wallis one-way analysis of variance was used to analyse the distribution of a variable measured at the ordinal level or above between more than two categories.

A rejection region (two tailed) of \( p \leq 0.05 \) was stipulated prior to analysis. One tailed regions of rejection, requiring the assumptions implicit in directionally predictive hypotheses, were avoided. Differences marginally failing to reach two tailed significance, but which would have achieved significance for a one tailed test, could not be accepted as significant because of the absence of certainty in directional predictions; it would not have been reasonable to regard the direction of an hypothesis as being supported by a one tailed level of significance, since such significance would rest upon the assumption that the original hypothesis was directionally correct.

**Summary**

Non-attendance, patient termination, slow treatment response and relapse are specified as areas of therapeutic failure affecting a large proportion of patients referred for treatment of childhood enuresis, and are defined for the purposes of the present study. The aims of the study in investigating these problems, in a practical clinical setting where conditioning therapy is the predominant but not the sole form of treatment, are stated. The organization of the Vale Drive special investigation clinic is described, and its criterion for discharge and method
of follow-up presented.

The research was conducted in two phases - a retrospective study of a one-year cohort of referred cases, and the subsequent closer study in the "concurrent" phase of expectancy, anxiety and attitudinal variables in relation to therapeutic failure, and of parental explanations of non-attendance and termination. Data relating to the nature of the retrospective sample are presented. The investigations conducted in each phase are listed, and the scales employed to assess pre-treatment expectancy (CE and PE), relapse expectancy (CRE and PRE), anxiety (CMAS and WPS) and attitudes to enuresis (CCS and PIS) are introduced. The nonparametric methods of analysis employed are discussed.
3. NON-ATTENDANCE (RETROSPECTIVE PHASE)

Introduction

The problem of non-attendance (defined in chapter two as failure to attend the clinic once an appointment had been given), following acceptance of referral, is familiar to most clinicians as a source of annoyance and wasted time. The problem has however received minimal attention, probably because the patient who fails to arrive thereby renders himself inaccessible to study. Rosenthal and Frank (1958) have epitomized the therapist's typical fatalistic approach in a study of child guidance cases; "needless to say, nothing could be done about appointment time lost through patients who simply failed to appear." Not only is non-attendance frequently regarded as a random occurrence to be tolerated, but a group of non-attenders has occasionally been so firmly regarded as equivalent in all respects to attenders - with the single exception of non-attendance itself - as to be used as a control group. In a study of the post-treatment psychological adjustment of child patients, Levitt et al. (1959) used such a group to control for the effects of spontaneous remission, although recognizing that unknown factors may differentiate non-attenders from treated patients.

In the economic and effective deployment of limited therapeutic resources, the identification of categories of potential non-attenders at the referral stage is of great significance. It is also of value in the theoretical appreciation of the process of acceptance and conduct of therapy if factors can be identified which differentiate attenders from non-attenders.
Method of investigation

Factors known or calculable at the time of referral for treatment were analysed to identify differences between the attending and non-attending groups of patients in the retrospective series. Data routinely collected on referral were investigated for the 212 consecutive cases of enuresis accepting referral to Vale Drive clinic during 1969. 38 patients subsequently failed to present themselves for treatment, representing a non-attendance rate of 17.9 per cent.

Five factors known or calculable at the time of referral were hypothesized as being of possible relevance to subsequent non-attendance: the age and sex of the patient, the source of referral, the distance between the child's home and the clinic, and the period of time spent on the waiting list for treatment. Age and waiting list period were regarded as having a possible relevance, since among child enuretics it may be expected that the rate of spontaneous remission of the disorder would be higher among patients awaiting treatment for a long period, and among younger patients. The latter prediction is consonant with the known fall in the incidence of enuresis with increasing age (Jones, 1960b). It was hypothesized that non-attenders would live further from the clinic, and that the non-attending group would contain a lower proportion of referrals in which the initiative was taken by the parents rather than by a statutory agency. In their study of out-patients allocated to psychotherapy for various disorders, Rosenthal and Frank (1958) found that patients "pushed" into therapy by social agencies tended to become non-attenders. This factor may conceivably
bear a significance beyond any specific type of disorder or orientation of clinic.

Results

Age: The patients in the present series were aged four to 15 years at the date of the initial appointment. No significant age difference (measured in complete years) was found between attending and non-attending groups of patients on analysis by the Mann-Whitney "U" statistic (appendix E, table one).

Sex: The series comprised 134 boys and 78 girls. There was no significant association between sex and attendance (appendix E, table two).

Referral Source: 127 cases were referred by school medical officers following routine medical inspections, 35 parents referred their children on their own initiative, 31 children were referred by their general practitioners and 16 were referred by health visitors. Three cases fell outside these main categories. Analysis across all four main categories yields an overall significant relationship between referral source and non-attendance (appendix E, table three). On further analysis it was found that significantly fewer patients referred by their general practitioners subsequently failed to attend for treatment when compared with those referred from all other sources (appendix E, table four), and a significantly greater number of patients referred by health visitors failed to attend (appendix E, table five). No significant differences between the numbers attending and failing to attend for treatment were found when patients referred by school medical officers were compared with those referred from all other sources (appendix E, table six), nor by
comparison of self-referred cases with all other referrals (appendix E, table seven).

Distance between home and clinic: The distance between each patient's home and the clinic was measured in a straight line and recorded to the nearest half-mile. Availability of transportation was not considered a measurable factor, because of the lack of comparability between the availability of bus services, underground railway services and private transport. It seems reasonable to assume that for a large number of cases there may be a positive relationship between actual or perceived inaccessibility of a clinic and a patient's linear distance from the clinic. Analysis by Mann-Whitney "U" yielded no significant difference in median distance from the clinic between attending and non-attending groups (appendix E, table eight).

Period spent awaiting treatment: Patients in the present series waited for a maximum period of 37 weeks after referral before an appointment could be given. The median waiting list period was 14 weeks. Patients were in all cases aware that they were awaiting treatment, and parents were asked to record the child's wet and dry nights being provided with a chart for this purpose. The median waiting period for the non-attending group (17.0 weeks) was, on analysis by Mann-Whitney "U", found to be significantly longer than that of the attending group (13.5 weeks) (appendix E, table nine).

Discussion

In the present study, the two factors found to bear a significant association with non-attendance were referral source and waiting list period. Both factors depend upon the organisation
and policy of a clinic and both are known or calculable at the time of referral. While it would be unjust to attempt to predict non-attendance in individual cases, knowledge of the above results could justifiably influence the policy of a clinic towards promoting attendance of patients from certain referral sources and reducing waiting list periods, which might be hypothesized as likely to reduce the problem of non-attendance. Although relating to a single disorder and a single clinic, the agreement of the above findings regarding referral source with those of Rosenthal and Frank (1958), working in a totally different field, suggests a possible wider validity.

The failure to find a significant relationship between a patient's distance from the clinic and his non-attendance for treatment may have been due to the crudity of purely linear measurement. If, however, this were the case, it would remain difficult to support an argument for decentralization of clinic facilities in an urban area by the phenomenon of non-attendance, since no simple and comparative measure is available of the relative accessibility to patients of complex urban transportation systems and of private means of transport. These conclusions should not, however, be considered to apply equally to more rural areas.

Spontaneous remission would seem inadequate as an explanation of non-attendance, since although non-attenders were those who had awaited first appointments for a longer period, younger patients whose spontaneous remission rate might be expected to be higher were not found to be any more likely to fail to attend for treatment. Indeed, the absence of any apparent relationship
between age and non-attendance does not appear to result from small sample size, since there is not even a non-significant trend towards a relationship.

A plausible hypothesis for the relationship between long waiting periods and subsequent non-attendance is that the non-attending child fails to arrive for his first appointment, not because treatment is no longer required, but because while waiting the familial motivation for treatment has dissipated, and enough time has elapsed for the intervention of factors and events not present at the time of referral but antipathetic to treatment. It seems reasonable to suppose that quite apart from any therapeutic "waiting list effect" on the disorder, motivation for treatment is at its highest at the time of referral and dissipates with the passage of time.

Patients whose parents do not seek treatment themselves but are referred by an outside agency (in this context, a health visitor) seem less likely to accept treatment than those who have sought the advice of their family doctor, whose decisions they are more predisposed to accept. Referrals which originate from school medical examinations arise from discussion between parent and doctor, and thus probably exhibit an intermediate level of advice seeking on the part of the parent. The findings would indicate a positive relationship between the proportion of active parental initiative in seeking the advice that resulted in referral, and the likelihood of entering treatment when it is offered. Cases in which the parent has made a direct referral to the clinic probably form a unique category of individuals who actively select the professional expertise they believe they
require, rather than solely seeking advice from a separate agency and being thus dependent upon its decisions regarding appropriate courses of action. Such parents might in some cases be expected to exercise similar initiative in the subsequent rejection of treatment when offered.

Summary

38 enuretic children who failed to attend for treatment at Vale Drive clinic were compared with 174 children who entered treatment. The former group was characterized by a low proportion of referrals from general practitioners, a high proportion of referrals from health visitors, and a longer period spent on the waiting list for treatment.
4. TERMINATION (RETROSPECTIVE PHASE)

Introduction

Patient termination of treatment was defined in chapter two as the withdrawal of a patient from treatment either by notification that no further appointments were desired, or by failing, without cancellation, three consecutive appointments.

During the course of the majority of out-patient therapies it may be expected that a proportion of patients will terminate treatment prematurely, either by positive rejection, or by default through persistent appointment failure. It is reasonable to take into account the rate of termination from any therapeutic regime in evaluating the overall efficacy of the therapies provided, since termination constitutes a major and frequently final breakdown in the process of collaborative treatment which is central to both medical and psychological practice.

Patient termination has hitherto been chiefly studied in the context of interpretative psychotherapy, wherein certain stages of treatment have been identified as "failure zones," particularly susceptible to termination (Rosenthal and Frank, 1958; Garfield and Affleck, 1959). Although it would seem that potential terminators are unlikely to be identifiable from "intake data" (Affleck and Garfield, 1961), many investigators have found low social class to relate to termination of psychotherapy (Imber, Nash and Stone, 1955; Katz, Lorr and Rubinstein, 1958; Rosenthal and Frank, 1958; Sullivan, Miller and Smelser, 1958; Cole, Branch and Allison, 1962). It has also been suggested that referral source (Rosenthal and Frank, 1958) and therapist-patient expectancies (Goldstein, 1962) may be implicated.
Goldstein has underlined the importance of congruence between patient and therapist attitudes and expectancies for continuation in some therapies, and it may well be that, in psychotherapy at least, the socioeconomic differences between therapists and patients of the lower socioeconomic levels may partly account for the reported social class bias in termination. Tuckman and Lovell (1959) and Ross and Lacey (1961), however, have reported the absence of a social class bias in the withdrawal of child patients from psychiatric treatment.

A wide variety of termination rates has been reported in the conditioning treatment of enuresis: in controlled trials, Werry and Cohrsen (1965) reported a termination rate of 18.2 per cent, while De Leon and Mandell (1966) reported the unusually low rate of 5.4 per cent. Young and Turner (1965) lost 29.5 per cent of their series through termination, while in an earlier trial, Young (1965) had reported a loss of 35.2 per cent, chiefly through parental non-co-operation rather than any failure of treatment. Where the therapists themselves terminated the treatment of non-co-operative cases, a loss of 47.6 per cent was reported (Turner, Young and Rachman, 1970). In reports of combined treatment strategies in different London clinics, Dische (1971) has reported a termination rate of 12.4 per cent, and White (1968) a 16.8 per cent rate of discharge for non-attendance.

The wide variety in termination rates may be partly ascribable to variety in the criteria of termination employed; it was thus considered for the purposes of the present research that the term "termination" should be applied to drop-out from treat-
ment by notification or default occurring at any time during the course of that treatment, rather than to a failure to remain in therapy for an arbitrarily specified period.

The series studied

One hundred and fifty eight cases from the retrospective series had entered treatment but were no longer in attendance on 12th May 1971, the date selected for data collection. Fifty of these patients (31.6 per cent) had terminated contact with the clinic, the remainder having been discharged on the arrest of enuresis. These 50 terminators were compared with the remaining 108 successfully discharged cases to identify factors associated with termination. The 14 patients treated by means of drugs or record-keeping without the use of an enuresis alarm were not found to differ significantly from the remainder of the series in their likelihood of termination (appendix E, table 10).

Results

The patient: Terminators were not found to differ significantly from non-terminators with regard to: (1) sex, (2) median age, (3) number of reported somatic symptoms, or (4) number of reported psychologic symptoms (appendix E, tables 11 to 14). The somatic and psychologic symptoms considered were those acknowledged by the parent from lists presented at the initial appointment.

It was hypothesized that patients having previous experience of treatment, frequently of an unsuccessful nature, might be predisposed to termination through a familial intolerance of therapy and therapeutic problems. The data, however, failed to confirm this hypothesis, the incidence of patients having previous experience of treatment for enuresis being comparable in
both terminating and non-terminating groups (appendix E, table 15).

The enuresis: It was considered possible that the nature of the child's enuresis and the consequent severity of the problem it presented to the patient and his family might be relevant to the family's readiness to persevere in treatment. Termination was not however found to be significantly associated with: (1) enuresis of the primary or secondary type, (2) irregularity of wetting, (3) the reported pre-treatment severity of enuresis, measured in terms of wet nights per week, (4) a history of spontaneous awakening to micturate, or (5) a reported reduction in wetting frequency while on the waiting list for treatment (appendix E, tables 16 to 20). The groups were comparable with respect to the incidence of diurnal urgency of micturition, frequency of micturition, diurnal enuresis and encopresis, either singly or in combination (appendix E, table 21); a similar number in each group exhibited one or more of these accompanying disorders (appendix E, table 22).

The family and the home: Since the treatment of enuresis, particularly where conditioning therapy is employed, requires a high level of parental cooperation, and most practitioners have experienced the refusal or failure of parents to assume or maintain the necessary collaboration in treatment, it was hypothesized that factors relating to the familial background of the patient might be implicated in termination.

The single variable found to support the above hypothesis was that of family history of enuresis. In 57.3 per cent of cases among the terminator and non-terminator groups studied, a history of enuresis in a parent or sibling was reported. A positive family history was reported significantly more frequently in the
terminator group than in the non terminator group (appendix E, table 23). This significance attaches, however, to the previous experience of enuresis in the family, and not specifically to the past or continuing enuresis of the mother, the father, or a sibling (appendix E, tables 24 to 26). Similarly, it seemed to be the fact of familial experience of enuresis, rather than the number of its members who had been enuretic, which was associated with termination; analysis of the number of current or past enuretics in the family, apart from the patient, yielded a non-significant result (appendix E, table 27).

Background factors bearing a non significant association with termination were: (1) social class (assessed according to paternal occupation in accordance with the Registrar General's classification (1)), (2) part or full-time employment of the mother, (3) age of the mother, (4) number of children in the family, and (5) the patient's rank position among his siblings (appendix E, tables 28 to 32). Neither youngest nor eldest children predominated to a significant extent among the terminators (appendix E, table 33).

It was hypothesized that patients whose families exhibited a relatively high level of instability might be more likely to become terminators. The data did not, however, support this hypothesis, termination not bearing a significant association with adverse familial circumstances (e.g. separation, divorce, loss of a parent, or an unmarried mother), nor with a history of separation from the parents for reasons other than illness (appendix E, tables 34 and 35).

Additional environmental variables which might have been expected to influence patients and their parents towards termination were those tending to increase the demands imposed by treatment. On analysis, termination was not however found to be associated to a significant extent with: (1) linear distance from the clinic (measured to the nearest half mile)\(^{(1)}\), (2) the sharing of the patient's bed by a sibling prior to treatment, (3) shared bedrooms, (4) multi-occupation of the home, or (5) the absence of an inside toilet (appendix E, tables 36 to 40).

**Treatment:** It would seem reasonable to hypothesize that the factors most immediately and thus most obviously connected with termination should be located in the process of treatment itself. Factors found to be associated with non-attendance (see chapter three), but not associated with termination to any significant extent, were: (1) referral source; comparing various sources (appendix E, table 42) and comparing self referrals with those referred by outside agencies (appendix E, table 43), and (2) waiting list period (appendix E, table 44).

It has been suggested by Turner, Young and Rachman (1970) that the use of adjuvant drugs in conditioning treatment may tend to increase parental cooperation. Adjuvant drugs had been prescribed in the present study to 66 patients among the 144 treated by means of an enuresis alarm. Analysis revealed, however, that the use of drugs was no more characteristic of the non-terminator than of the terminator group (appendix E, table 45). Reported malfunctioning of an enuresis alarm in use was not associated significantly with termination (appendix E, table 46).

\(^{(1)}\) Measurement of this variable has been discussed in chapter three
The expectation that terminating cases would have been more frequently judged non-cooperative while still in clinic attendance, was confirmed (appendix E, table 47). The most typical episodes of non-cooperation recorded were failure to use an enuresis alarm at all, or the child switching the alarm off at bedtime.

It was hypothesized that the failure of a child to awaken to an enuresis alarm stimulus might militate against progress in treatment and probably exhaust parental tolerance of alarm use, conceivably engendering increasingly poor cooperation which might culminate in termination. Support was lent to this expectation by the finding that children failing to awaken to the auditory stimulus of an enuresis alarm predominated to a significant extent in the terminator group (appendix E, table 48). Terminators were not, however, significantly more likely to have been regarded by their mothers as deep sleepers prior to treatment (appendix E, table 49).

Apart from recorded non-cooperation with treatment, it was considered that a history of repeated appointment failure might indicate inappropriate parental attitudes. It was indeed found that the median percentage of appointments missed (prior to the failure of the three consecutive appointments forming the criterion of termination in the case of terminators) was significantly higher for the terminator group (appendix E, table 50). This significance, however, related to appointments missed without prior cancellation and not to cancelled appointments, the percentage of which was comparable between the two groups (appendix E, table 51).
NB Beyond 56 weeks, the presence of current cases renders the distribution incomplete.

Figure 5. Duration of clinic contact for terminating patients.
In 61 cases from the total of 144 whose treatment involved the use of an enuresis alarm, overlearning had been prescribed as the final stage of treatment. This procedure involves an increased fluid intake once the initial success criterion has been achieved, and is employed as a measure aimed at countering the problem of relapse; the procedure and its rationale are discussed in full in chapter six. Since overlearning prolongs the period of treatment and frequently involves a renewal of wetting, it was predicted that its prescription might be associated with termination. The opposite was, however, found to be the case; patients allocated (on an unselected basis) to overlearning proved significantly less likely to be terminators than non-terminators (appendix E, table 52). It was also found that among cases treated with enuresis alarms, no significant association existed between termination and the cessation of overlearning where an unacceptably high frequency of renewed wetting ensued (appendix E, table 53).

The occurrence of termination: The median period between a terminator's first appointment and withdrawal from treatment was 13.3 weeks (see fig. five), while the median duration of treatment culminating in discharge was 14.3 weeks. Comparison by the Mann-Whitney "U" test revealed no significant difference between the period spent in clinic attendance by terminators and by non-terminators (appendix E, table 54). The period of time spent in clinic attendance prior to termination was not significantly associated with social class, nor with the child's sex (appendix E, tables 55 and 56). The Spearman Rank correlation coefficient of -0.17 between age and period of attendance before termination
is non-significant (appendix E, table 57).

Use of the Kruskall-Wallis one-way analysis of variance yielded a significant association between family size and mean time to termination (table 13). The period of time elapsing before withdrawal from treatment increased with family size, with a peak for families of four children and a reduction among families of five or more children (see table 13).

<table>
<thead>
<tr>
<th>Children in the Family</th>
<th>1 or 2</th>
<th>3</th>
<th>4</th>
<th>5 or more</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Cases</td>
<td>14</td>
<td>13</td>
<td>15</td>
<td>8</td>
<td>50</td>
</tr>
<tr>
<td>Mean Weeks to Termination</td>
<td>18.14</td>
<td>23.77</td>
<td>27.87</td>
<td>6.0</td>
<td></td>
</tr>
</tbody>
</table>

\( H = 8.54, \text{ df } = 3, p<0.05 \) Significant

Table 13: Termination and Family Size

Because the patients in the present study were schoolchildren, it seemed feasible that the number of terminators might vary between term time and school holidays; no particular months of the year, however, appeared especially conducive to termination, and the month in which treatment had commenced bore no significant association with subsequent withdrawal from treatment (appendix E, tables 58 and 59).

Analysis of table 14 reveals a significant association between

<table>
<thead>
<tr>
<th>Appointments Given</th>
<th>1 to 6</th>
<th>11 to 16</th>
<th>21 to 26</th>
<th>31 to 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number Terminated</td>
<td>11</td>
<td>22</td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>

\( \chi^2 = 50.26, \text{ df } = 6, p<0.001 \) Significant

Table 14: Termination in relation to appointments given termination and the number of appointments given to a child; the likelihood of a patient's withdrawal from treatment cannot thus be considered constant throughout his course of treatment. The
major "failure zone" would appear to be between the sixth and tenth appointments (see table 14). A significantly higher proportion of terminators had dropped out within their first 10 appointments than subsequently (appendix E, table 60).

A further hypothesis made concerning termination was that it might represent not a rejection of treatment, but a failure to return to the clinic for formal discharge once the child had become tolerably dry - i.e. that it might constitute discharge on the parents' rather than the therapist's terms. To investigate this hypothesis, the wetting frequency (in terms of wet nights per week) of terminators reported at their last kept appointment was compared with that reported by normally discharged patients at their penultimate appointment. The finding that terminators reported significantly more wet nights at this stage (appendix E, table 61) requires rejection of the hypothesis that termination merely constitutes failure of the final (discharge) appointment; the severity of enuresis among terminators at the time of termination is further investigated and discussed in chapter seven.

Discussion

Terminators do not appear to have progressed so well in treatment as have children whose treatment culminates in discharge, yet their period of clinic attendance is comparable with that normally required to achieve discharge. It would probably be valid to state that patients are not withdrawn from treatment when making normal progress. The foregoing analysis indicates that the failure to progress in treatment, which culminates in termination, may well flow from antipathetic parental attitudes which preclude the requisite consistency and persistence of
co-operation in the use of an enuresis alarm. An interactive
effect would be expected between non-cooperation and failure to
progress, to the further detriment of the efficacy of treatment.
Further support for the view that termination may derive from
inappropriate familial attitudes is offered by the existence of
a relationship between termination and a positive family history
of enuresis. The latter appears to be the only familial variable
among those studied which may be regarded as a possible influence
upon the attitudes of a family towards enuresis, perhaps
ingenerating tolerance of wetting with a concomitant low motivation
for treatment. This situation might be expected to produce a high
degree of sensitivity to the inconveniences encountered through
treatment, as indicated by the frequent non-cooperation and
appointment failure of the potential terminator.

While it may be that the high frequency of reports of
ineffectiveness of an alarm in waking the patient among
terminators might directly contribute towards the general
ineffectiveness of their treatment, it is also quite conceivable
that the tolerance of the terminating family for problems
encountered in treatment is low. The families of terminators may
be resigned to the problems of enuresis itself as an occurrence
which is frequently a repetition of the experience of other
members of the family, and may be predisposed to give up rather
than to persevere in the face of therapeutic difficulties.

Patients may not be withdrawn from treatment in consequence
of the demands and temporary relapse that overlearning may
bring, since they have already demonstrated the efficacy of
treatment in the achievement of 14 consecutive dry nights. It
seems reasonable to suppose that successful treatment will favourably predispose patients and their parents towards remaining in treatment during the brief overlearning period. This predisposition would appear sufficiently strong to overcome even the frustrations of attempted overlearning in cases where an unacceptably severe renewal of wetting is encountered, meriting withdrawal of the regime.

The finding that in families of five or more children, termination where it occurs is rapid, is easily comprehended in terms of the rapid expenditure of tolerance of therapeutic demands in large families. The data strongly suggest that family size is irrelevant to the rapidity of termination in families with fewer than five children, the trend in fact being contrary to expectation, indicating slightly less durability of tolerance in very small families.

The number of patients terminating relates at a significant level with the number of appointments received, and the first ten appointments may be identified as the "failure zone" in the situation investigated. This evidence considered in conjunction with the comparability of the duration of clinic attendance for both terminators and those remaining in treatment until normal discharge, justifies the conclusion that both groups of patients "tolerate" treatment for a similar period. The characteristic of the terminator is thus not rapid withdrawal from treatment, but a low level of both familial tolerance and co-operation which, not surprisingly, relates strongly to therapeutic failure.

The finding that factors relating to housing were not associated with termination to any significant extent may indicate that
although poor or overcrowded housing conditions may be expected to increase the difficulties imposed by treatment, particularly where an enuresis alarm is used, this effect may be largely offset by the increased problems engendered by enuresis itself under these conditions.

Conclusion

In considering a wide variety of variables of possible significance to the withdrawal of children from treatment by their parents, the genesis of such premature termination has been tentatively located in familial attitudes antipathetic towards successful treatment. The specific attitudes concerned would appear to be tolerance of enuresis, accompanied by relative intolerance of demanding and disruptive treatment procedures and a concomitant sensitivity and over-reaction to difficulties commonly encountered in the course of therapy. Such attitudes would seem to occur in families already familiar with, and thus somewhat accommodated to, the problem of enuresis - and to occur independently of demographic variables. To a family in which enuresis may have come to be regarded as an intrinsic part of the process of growing up, wet beds may be preferred to the demands of an albeit potentially effective treatment.

While the present data do not permit the reliable prediction of termination from intake or treatment data, they do nevertheless underline the probable nature of breakdown in parental cooperation with treatment, from which the child suffers.

Summary

50 enuretic children, prematurely withdrawn by their parents from treatment at the special investigation clinic, were compared
with 108 patients remaining in therapy until normal discharge. Analysis of background and treatment variables revealed a statistically significant relationship between termination and a positive family history of enuresis, lack of progress in treatment, non-cooperation with treatment, frequent appointment failure and the failure of an enuresis alarm to awaken the child. The rapidity of termination was found to relate to family size, and the first ten appointments were identified as a "failure zone" for termination. The results are discussed in relation to inappropriate familial attitudes towards enuresis and its treatment.
5. SLOW THERAPEUTIC RESPONSE (RETROSPECTIVE PHASE)

Introduction

Slow response was arbitrarily defined in chapter two as a treatment duration of 32 weeks or more. Individual differences in the rapidity of response to treatment are great, the hypothesis of latent learning (Stevenson, 1934; Rachman, 1963; Eysenck and Rachman, 1965) possibly being applicable in some cases of extremely rapid response (see chapter one). Where response to treatment is slow, knowledge of the factors associated with slow response may suggest measures likely to facilitate the progress of treatment and possibly to forestall the premature withdrawal from treatment of patients making little progress.

Throughout the literature, failure to make an acceptably rapid response to treatment has been classified as therapeutic failure. The majority of investigators have equated slow response with failure by stipulating either a maximum period of time, or a maximum number of reinforcements (enuresis alarm stimuli) within which remission of enuresis should occur (Lovibond, 1963b; Young and Turner, 1965; Baker, 1969; Turner, Young and Rachman, 1970). Factors suggested as being of prognostic relevance for slow or unsatisfactory response include: (a) failure to awaken to the sound of an enuresis alarm (Jones, 1960b; Young and Turner, 1965; Browning, 1967); (b) parental non-cooperation (Gennert, 1953; Jones, 1960b; Freyman, 1963; Wickes, 1963; Fraser, 1971); and (c) the presence of multiple wetting each night together with diurnal urgency and frequency of micturition (Lovibond, 1964). Seiger (1952) suggests that enuresis of the secondary type may prove particularly resistant to treatment,
Kolvin et al. (1971) confirming this with a report that the response of primary enuretics to conditioning treatment is the more favourable. Wickes (1958) has commented that cases responding well to conditioning therapy frequently exhibit a rapid initial response to treatment. In a controlled trial of conditioning therapies, Turner, Young and Rachman (1970) have reported the absence of an association between outcome and age, sex or the severity of enuresis. Two studies have, however, reported a more satisfactory prognosis for the younger child (Gillison and Skinner, 1958; Wickes, 1958). These latter authors also report a more favourable prognosis in cases where wetting is frequent. Intelligence has not been found to be a prognostic factor in the behavioural treatment of enuresis (Biering and Jespersen, 1959; Freyman, 1963).

The average duration of successful treatment reported in studies of conditioning therapy varies from two to three months (Freyman, 1963; Young, 1965b; Young and Turner, 1965; Turner, Young and Rachman, 1970; Dische, 1971). Such estimates should however be interpreted with caution, since it is common practice to exclude from the relevant calculations a number of cases arbitrarily classified as "failures" through slow treatment response. Young and Turner (1965) reported that seven per cent of their patients remained in treatment four months after admission. These authors have also suggested that the rate of therapeutic response may be increased by the use of CNS stimulant drugs, which they postulate as facilitating conditioning (see chapter one).
NB Beyond 56 weeks, the presence of current cases renders the distribution incomplete.

Figure 6.
Distribution of treatment duration.
The series studied

In order to identify factors associated with slow therapeutic response, the group of slow responding patients was compared with a contrasted group of rapidly responding patients, the latter achieving discharge in 10 weeks or less (see chapter two). These groups comprise the cases falling respectively into the longest and shortest quartiles of the distribution of treatment durations among referrals accepted during 1969, given in fig. six. Fifteen cases who were still attending the clinic on 12th May 1971 are included in the slow responding group, having then attended the clinic for a period in excess of 56 weeks.

The median duration of treatment for the 124 patients of the retrospective series who had been discharged prior to 12th May 1971 or were still in current attendance on that date, was 17.6 weeks (with a semi-interquartile range of 10.6 weeks). That this figure is appreciably larger than that commonly reported in conditioning trials may be accounted for by two factors: firstly, the present study is concerned with the treatment of unselected patients in a practical clinical context, and thus does not exclude those patients for whom conditioning therapy was considered unsuitable, (1) or whose treatment was interrupted by parental non-cooperation or by the intervention of holidays spent away from home. Secondly, unlike the majority of clinical trials, the present study concerned the treatment duration of all patients other than those withdrawing from treatment, and does not exclude as "failures" those patients remaining in treatment.

(1) Two "slow" and two "rapid" patients were treated with drugs or solely by keeping a record chart of wet and dry nights. All other patients were treated with an enuresis alarm.
after an arbitrarily fixed period of time or number of reinforce-
ments - a practice which has the effect of artificially
depressing the reported median or mean treatment duration.

Results

The patient: Although boys outnumber girls in the enuretic
population by approximately two to one (see chapter one), and the
patient's sex may thus be hypothesized as a prognostic factor, no
association was found between sex and allocation to slow or
rapid groups in the present study (appendix E, table 62). This
result confirms earlier findings in similar special investigation
clinics by Young and Turner (1965) and by Turner, Young and
Rachman (1970). A further finding of these authors was confirmed
by the absence of a significant association between the child's
slow and rapid response in the present study (appendix E,
table 63); the report of a more satisfactory prognosis for the
younger child made by Gillison and Skinner (1958) and by
Wickes (1958) was therefore not supported.

Enuresis is frequently reported as occurring in association
with other concurrent disorders (see chapter one), and it may
therefore be postulated that the general somatic and psychological
health of the child might prove of prognostic relevance. The
slow and rapid response groups were however found to be comparable
in the numbers of somatic and of psychologic symptoms acknowledged
by the parent from lists presented during an interview at the
initial appointment (appendix E, tables 64 and 65).

An appreciable number of patients had undergone previous
tries at treatment prior to arrival at the clinic; these
cases however did not predominate in either slow or rapid response
group (appendix E, table 66). It is probable that the failure of these treatments was due to a therapeutic ineffectiveness rather than to an early recalcitrance of the patient to therapeutic effort.

It has been hypothesized that introverts should prove more amenable to conditioning than extraverts (Eysenck, 1957). If this is a valid hypothesis applicable to the conditioning treatment of enuresis, it may be expected that personality on the dimension of introversion/extraversion might prove of prognostic significance in a clinical setting in which conditioning treatment is the predominant therapeutic approach. Children of the present series had been given the Junior Eysenck Personality Inventory (1) to complete at home, at an early juncture in their treatment. Since the norms for the JEPI vary with age and sex (Eysenck, 1965), children were classified as "introverted" if their extraversion score fell more than one standard deviation below the mean score for their age and sex, and "extraverted" if their score fell more than one standard deviation above the mean. The child's age was taken to be the age at the commencement of treatment, since not all JEPI forms had been dated. Analysis by means of a Fisher exact probability test indicated no significant difference in the proportions of introverted and extraverted children falling into the slow or rapid response groups (appendix E, table 67), the present study therefore failing to support the hypothesis that extraverted children should predominate among slow responding patients. It should however be noted that completed JEPI scales were not returned to the clinic

(1) Published by the University of London Press, Ltd.
in many cases, being available in only 27 cases (of which 11 fell into the introvert or extravert categories among the slow and rapid response groups), and that CNS stimulant drugs had been administered to some children, possibly affecting their "conditionability" (Young and Turner, 1965). It had been ascertained prior to analysis that cases in which scores were available were not typical of the slow and rapid response groups.

The possibility that neuroticism, as indicated by the JEPI, may be a factor of prognostic relevance in clinical practice was also investigated. Children were classified as "normal" or "neurotic" according to their neuroticism score, the latter category being arbitrarily defined as possession of a score above one standard deviation from the mean score for the child's age and sex. No predominance of neurotic patients was found in either slow or rapid groups on analysis by the Fisher exact probability test (appendix E, table 68).

The enuresis: Although the precise nature of an enuretic's eliminative disorder, and the various common diagnostic classifications made, are frequently regarded as being factors of possible relevance to subsequent therapeutic response, the present findings fail to support these common assumptions. The slow and rapid response groups did not differ significantly in their constitution with regard to; (1) primary and secondary enuretics, (2) children whose wetting was irregular, (3) the severity and enuresis measured in terms of wet nights per week, (4) children with a history of spontaneous awakening to micturate, or (5) children reported as improving while on the waiting list for treatment (appendix E, tables 69 to 73).
Investigating the possible relevance of accompanying eliminative disorders, it was found that the members of neither slow nor rapid groups were significantly more likely to have suffered from either diurnal urgency or frequency of micturition, nor to exhibit any greater number of disorders of continence in addition to nocturnal enuresis (appendix E, tables 74 and 75): the additional problems considered were diurnal urgency and frequency, diurnal enuresis, and encopresis.

The family and the home: The treatment of enuresis, particularly where an enuresis alarm is employed, requires parental cooperation, and the child's mother may be regarded as a central figure both in the actual conduct of therapy and through her relationship with the child. The mothers of slow and rapidly responding patients were not found to differ significantly with regard to;

(1) age (the median ages of the mothers of slow and rapid group patients were 34.5 years and 36 years respectively), (2) employment or non-employment, (3) raw scores for extraversion on the Eysenck Personality Inventory\(^1\) and (4) raw scores for neuroticism on the EPI\(^2\) (appendix E, tables 76 to 79).

It was considered possible that maternal anxiety might affect both the child patient and the actual conduct of therapy, and thus that the routine assessment of the mother's anxiety at an early stage in treatment might differentiate slow from rapid responders. The mothers of retrospective series patients had been

\(^{1}\) Published by the University of London Press, Ltd.

\(^{2}\) It had been ascertained prior to analysis that cases in which completed EPI and Willoughby Personality Schedule scales were available were not atypical of the slow and rapid groups.
given the Willoughby Personality Schedule\(^{(1)}\) (Willoughby, 1932; 1934;) at an early stage of treatment, for completion at home. The WPS is a 25 item test of the trait of "neurotic anxiety" or "persistent unadaptive anxiety reactions" (Wolpe, 1958). To investigate the prediction that the mothers of slow responding patients may be more anxious than those of the rapid responders, the median WPS scores obtained by the mothers of these two groups (respectively 37 and 28, from a total possible score of 100) were compared by means of the Mann-Whitney "U" statistic (appendix E, table 80). The median WPS score for the slow responding group was found to be significantly higher, thus confirming the prediction.

Hypothesizing that home background may be of significance in prognosis, various factors of possible relevance were investigated. Although it should be noted that the social class of Vale Drive patients is approximately normally distributed around social class III - manual (see chapter two) and thus does not reflect the social class distribution reported in many epidemiological studies (see chapter one), speed of treatment response was found to be independent of social class level when dichotomized between social class III - non manual and II, and also when the two largest social class categories, namely I with II, and III, were compared (appendix E, tables 81 and 82). Social class does not therefore appear to be of prognostic relevance in the practical clinical context studied. Other family background factors found not to be significantly associated with membership of the slow or rapid groups were the number of children in the family (appendix E, table 80).

\(^{(1)}\) The WPS has been revised by Wolpe (1969); the original version, however, is employed throughout the present study.
table 83), and the patient's rank position among his siblings (appendix E, table 84). The proportion of youngest and eldest children was similar for both groups (appendix E, table 85). The experience of enuresis in other members of the patient's family, found to be significantly associated with the premature withdrawal of children from treatment (see chapter four), was not significantly associated with slow or rapid response (appendix E, table 86).

Enuresis is a disorder exacerbated by poor housing conditions, and its treatment at a clinic oriented towards the widespread use of the enuresis alarm may be rendered more burdensome under overcrowded conditions. The hypothesis that slow response might be significantly associated with poor housing conditions was, however, not supported by the data; the slow and rapid groups did not differ significantly in their constituent proportions of patients who normally shared a bed with a sibling prior to treatment, who shared a bedroom, or who lived in multi-occupied accommodation (appendix E, tables 87 to 89).

Stein and Susser (1967) have implicated family pathologies in the persistence of enuresis (see chapter one), and it was hypothesized that these factors might also militate against rapid progress in treatment. While a history of separation from the parents for reasons other than illness was found to bias a child towards neither slow nor rapid response (appendix E, table 90), children having a disturbed family background did dominate to a significant extent in the slow responding group (appendix E, table 91). The family background was deemed to be disturbed if the child's parents were separated or divorced, if the mother
reported her marriage to be on the point of breakdown, if the child had lost a parent through death or long-term illness or was the child of an unmarried mother, or was living with a step-parent, foster parent, or in a homeless families unit.

_Treatment:_ Since referral source was found to be associated with the phenomenon of non-attendance (see chapter three), it was considered possible that the differences between patients referred from different sources might be of relevance to the speed of subsequent therapeutic response. No significant relationship was, however, discovered (appendix E, table 92). In chapter three, it was also reported that prolonged waiting-list periods were associated with failure to enter treatment; however, waiting-list period was irrelevant to slow or rapid response among patients persevering throughout treatment (appendix E, table 93). The maximum waiting-list period for patients included in these groups was 24 weeks.

It was considered reasonable to expect factors related to the treatment process itself to influence the speed of response made by patients, the intervention of problems in treatment retarding progress. In order to hold the factor of treatment duration constant between the two groups, only those problems occurring within the first 10 weeks of treatment were considered for the slow responding group. The slow group was not, however, found to be significantly characterized by frequent reports of the faulty operation of an enuresis alarm in use, nor by a high incidence of poor cooperation (typically, involving refusal to use an alarm, or the attempted sabotage of treatment through a child turning an alarm off at bedtime) (appendix E, tables 94 and 95).
The one treatment problem which was found to be strongly and significantly related to slow response was failure of an enuresis alarm stimulus to awaken the child (appendix E, table 96). For some children treated with an alarm, the equipment employed thus presumably afforded an insufficient or inappropriate waking stimulus. The intergroup difference in the number of children reported by their mothers to be deep sleepers was insignificant (appendix E, table 97).

Drugs (methedrine, tyrimide or tofranil) were prescribed in 15 cases during the course of treatment (or during the initial 10 weeks in the case of slow responders). A significantly greater number of slow responders had been prescribed drugs (appendix E, table 98), which were in most cases used either during holiday periods away from home, when alarm use was impracticable, or as a measure adjuvant to the concurrent use of an alarm. In some cases, senokot was prescribed in the concurrent treatment of encopresis. A Fisher exact probability test indicated no significant difference between slow and rapid groups with respect to the number of cases in which conditioning treatment was interrupted by holiday periods spent on drugs alone, although the number of cases involved was very small (appendix E, table 99).

**Discussion**

The strategy of the present study in comparing contrasted groups affords a powerful means of identifying associations between speed of response and the factors studied, while the practical clinical context of the research permits generalization of the results into comparable forms of clinical practice. The findings prompt requestioning of certain prognostic assumptions commonly made in the treatment of enuresis; thus for instance it
would not appear valid to regard waiting list improvement, the
type or severity of the child's enuresis, or the age and sex of
the child as factors of prognostic significance. The present
findings do not confirm the report of Kolvin et al. (1971) that
enuresis of the primary type carries a more favourable prognosis.
It is worthy of note that the hypothesized relevance of personality
on the introversion/extraversion dimension was not apparent in the
present study.

Perhaps surprisingly, non cooperation with treatment by
parent or child does not appear to prejudice chance of rapid
recovery; possibly non cooperation insufficient to culminate in
withdrawal from treatment is too weak an influence upon the
therapeutic process to measurably counteract its benefits,
provided that the clinic staff deal appropriately and promptly
with instances of poor cooperation.

The strongest factor associated with slow therapeutic
response is the child's failure to awaken to the sound of a loud
buzzer or oscillator. Lovibond (1964) has noted that in a small
minority of cases, a therapeutic response may be obtained where
the child responds to an enuresis alarm with reflex inhibition of
the urinary stream but without waking; a phenomenon occasionally
noted by the present investigator at the Vale Drive clinic.
Failure to awaken to an alarm, however, is probably indicative of
an insufficiency in the alarm stimulus employed, and a child who
fails to respond adequately to the stimulus may be expected to
fare poorly in treatment. Unfortunately, clinical experience
suggests that problems in hearing the alarm tend to be prolonged
and recurrent for many poorly responding children, even if
different buzzers are substituted. Although parents may be instructed to awaken the child vigorously once the alarm is triggered, the time lag between the onset of micturition and awareness of the alarm stimulus is probably too great for effective learning to take place.

The significantly greater number of slow responders prescribed drugs during the course of treatment is probably due to the prescription of adjuvant drugs to patients making a poor response to treatment, and thus permits no conclusion regarding the value of such drugs - except to suggest that their use fails to counteract lack of progress in treatment to an extent sufficient to remove the significant difference in the administration of drugs to the two groups.

Conclusion

The findings of the present investigation afford extension of theories implicating anxiety and family pathologies in the aetiology of enuresis, highlighting their relevance in the subsequent treatment of the disorder. The mother appears as a central figure in treatment, her own trait anxiety being associated with her child's rate of progress in treatment.

The area most deserving of further research would seem to be the development of a more effective range of waking stimuli, or of techniques aimed at sensitising children to existing stimuli. Investigation of the comparative therapeutic efficiency of three alarm types commonly used at the Vale Drive clinic, and employing subjectively very different alarm stimuli, has unfortunately revealed no superiority for any specific type of auditory stimulus (Young and Morgan, 1973d). The implication is that
either the usual forms of auditory stimulus are not the most effective, or that they deserve far from universal application. Possible future lines of research in this area may include the investigation of auditory stimuli of novel pitches and volumes or with a varying note, the use of vibrators or of a percussion stimulus, and the possible value of optical stimuli employing various forms of illumination.

**Summary**

Contrasted groups of slow and rapid responders at the Vale Drive clinic were compared in relation to a wide range of background and treatment variables. The slow response group was characterized by significantly higher levels of anxiety amongst the mothers, and a significantly higher incidence of familial disruption. Slow responders had more frequently received drug therapies at an early stage of treatment, and were significantly more likely to give a history of failure to awaken to the auditory stimulus of an enuresis alarm in the course of treatment.
6. RELAPSE (RETROSPECTIVE PHASE)

Introduction

A high rate of relapse has proved a major drawback to the conditioning treatment of enuresis. Reported relapse rates vary according to the period of follow-up employed, Lovibond (1964) reporting a correlation coefficient of 0.7 between relapse rate and minimum follow-up period over a number of studies. Relapse rates ranging from 8 per cent to 52 per cent have been recorded (Lovibond, 1964; Young, 1969). The prescription of CNS stimulant drugs to accelerate initial treatment has been found to increase the subsequent relapse rate (Young and Turner, 1965; Turner and Young, 1966). It has been predicted that the use of intermittent reinforcement schedules during initial treatment should strengthen the therapeutically acquired responses against extinction and so reduce the subsequent incidence of relapse; clinical experimentation has however not yet yielded a significant reduction in relapse rate where intermittent reinforcement is employed (Lovibond, 1963; 1964; Turner, Young and Rachman, 1970).

Few investigators have attempted to identify the type of child whose learned responses are most susceptible to the extinction which constitutes relapse, although Lovibond and Coote (1970) found a significant increase in the relapse rate among children whose nocturnal enuresis was accompanied by diurnal urinary symptoms. Young (1965c), in accordance with a hypothesis relating personality and conditioning (Eysenck, 1957; 1960a), found extraverted children to be significantly more susceptible to relapse than introverted children.
The series studied

In order to investigate factors of possible relevance to relapse, the 26 children of the retrospective series known to have relapsed prior to 12th May 1972 were compared with the 82 patients of the series discharged by that date but not reporting relapse on follow-up (see chapter two). The method of follow-up and the definition of discharge are presented in chapter two.

The follow-up period obtained varied according to the date of discharge of each patient. Table 15 presents a summary of the periods over which follow-up information was provided by parents in reply to enquiry letters. In all but two cases, at least one reply was received.

<table>
<thead>
<tr>
<th>Period for which follow-up information is available</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 months</td>
<td>10</td>
</tr>
<tr>
<td>4-6 months</td>
<td>5</td>
</tr>
<tr>
<td>7-9 months</td>
<td>6</td>
</tr>
<tr>
<td>10-12 months</td>
<td>13</td>
</tr>
<tr>
<td>13-15 months</td>
<td>23</td>
</tr>
<tr>
<td>16-18 months</td>
<td>19</td>
</tr>
<tr>
<td>19-21 months</td>
<td>16</td>
</tr>
<tr>
<td>22-24 months</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>106</td>
</tr>
</tbody>
</table>

NB: 1) No follow-up data received for two cases.
2) Table incorporates data covering the period from discharge to 12th May 1971, but received after that date.

Table 15: Follow-up periods (retrospective phase)

To exclude the possibility that members of the relapsed group might have received a longer period of follow-up than other patients, the median period from discharge to the collection of...
data (12th May 1971) was compared for relapsed and non-relapsed groups. No significant difference was found (appendix E, table 100).

Results

The patient: Since boys predominate among enuretics (the present sample comprised 72 boys and 36 girls), it was predicted that whatever factors may operate to disrupt the normal acquisition and maintenance of nocturnal bladder control among boys, might also operate to produce the extinction of therapeutically acquired continent responses among more boys than girls, and more rapidly among boys than girls. Neither prediction was, however, supported; no significant predominance of boys was found among relapsing patients, and the median time elapsing between discharge and relapse was comparable between the sexes (appendix E, tables 101 and 102). Thus it would seem that whatever factors may account for the especial susceptibility of boys to nocturnal enuresis, their influence is spent before the disorder is likely to be treated, or is countered by the process of treatment.

Children constituting the present sample ranged in age from four years to fifteen years. Since evidence exists that the persistence of enuresis into later childhood may be related to familial stress (Stein and Susser, 1967), it was hypothesized that the more prolonged influence of such stress prior to treatment, together with its continued influence after cure, initial arrest, might combine to render conditioned responses more liable to extinction among older children. Although analysis by Mann-Whitney "U" indicated no significant difference between the median ages of the relapsed and non-relapsed groups of patients
(appendix E, table 103), a significant negative correlation (Spearman Rank $r_s = -0.47$) was found between age at the commencement of treatment, and the period of time elapsing before relapse (appendix E, table 104). Thus, while older children do not appear especially prone to relapse following successful treatment of enuresis, age is associated with the rapidity of extinction of learned continent behaviour among those in whom relapse does occur, rate of extinction increasing concomitant with the child's age. Relapsed patients were not found to differ significantly from the non-relapsing group with respect to the number of additional somatic or psychologic disorders acknowledged by the parent prior to treatment (appendix E, tables 105 and 106), and those having undergone previous attempts at treatment without permanent effect were not found to predominate among those relapsing subsequent to treatment at Vale Drive (appendix E, table 107).

Scores were available for most patients on the Junior Eysenck Personality Inventory; it had been ascertained prior to analysis that cases in which scores were available were not atypical of the two groups studied. The children were classified as extraverted, introverted, neurotic and normal by comparison with the norms for their age and sex (Eysenck, 1965), the cut-off points for extraversion, introversion and neuroticism being one standard deviation from the mean of the appropriate scale (this classification is discussed and further described in chapter five). The hypothesis that extraverted children should predominate among relapsing patients (Young, 1965c) was not supported, analysis by

---

(1) Published by the University of London Press, Ltd.
the Fisher exact probability test revealing no significant predominance (appendix E, table 108); it should however be noted that this result concerns a small number of patients, twelve cases only falling into either introverted or extraverted categories. Neurotic children were not found to predominate significantly in either relapsing or non-relapsing group on analysis by the Fisher exact probability test (appendix E, table 109).

The enuresis: It was considered feasible that the extent of the change in behaviour pattern represented by the remission of enuresis may vary from one case to another, and treatment apparently aimed at effecting a more widespread change, relapse might prove more likely. Analysis, however, did not indicate any category or history of enuresis which might be considered particularly conducive to the problem of relapse, relapsing and non-relapsing groups not differing significantly in their constitution with regard to; (1) primary and secondary enuretics, (2) children whose wetting was irregular, (3) the severity of enuresis measured in terms of wet nights per week, (4) children with a history of spontaneous awakening to micturate, or (5) children reported as improving while on the waiting list for treatment (appendix E, tables 110 to 114).

The occurrence of diurnal urinary symptoms has previously been reported to bear a significant relationship to relapse (Lovibond and Coote, 1970); in the present study, however, a tendency for the likelihood of relapse to increase together with the number of additional eliminative disorders present failed by a narrow margin to achieve significance (appendix E, table 115).
The eliminative problems recorded were the urgency and frequency of micturition, diurnal enuresis and encopresis. There was no apparent effect of the type of additional disorder upon the likelihood of relapse (appendix E, table 116).

The family and the home: It was hypothesized that certain forms of housing conditions might affect the likelihood of relapse, either by creating situations in which enuresis might be expected to be an especial embarrassment, or by rendering difficult the use of a toilet at night. The following three circumstances were however not found to bear a significant relationship to the phenomenon of relapse; (1) multi-occupation of the child's home, (2) the lack of an indoor toilet, or (3) the presence of one or more siblings in the same bedroom as the patient (appendix E, table 117 to 119).

Social class, which has a definite relationship with the incidence of enuresis in the population as a whole (see chapter one) was not found to be significantly associated with the probability of relapse following treatment, when patients were allocated to one of three socioeconomic levels according to the occupation of the father (appendix E, table 120). Kruskall-Wallis one-way analysis of variance revealed no significant association between social class and the period of time elapsing prior to relapse (appendix E, table 121).

Familial interactions have been implicated in the genesis and persistence of enuresis (MacKeith, 1968; Young, 1965d; Stein and Susser, 1967), and it was considered possible that certain familial factors might be associated with failure to maintain the therapeutic response of continence following the cessation of
therapy and clinic supervision. Relapse was not, however, found to be significantly associated with: (1) the number of children in the family, (2) the patient's rank position among his siblings, (3) part- or full-time employment of the mother, (4) maternal age, or (5) a positive family history of enuresis (appendix E, tables 122 to 126). Neither youngest nor eldest children predominated to a significant extent in the relapsed group (appendix E, table 127), and family size was not found to associate significantly with the speed of relapse within the relapsed group (appendix E, table 128).

Two factors representing various deviations from normal familial interactions were found to have no significant association with relapse; these were a reported history or separation of the patient from the family for reasons other than illness, and the presence of a grossly disrupted family environment (appendix E, tables 129 and 130). Circumstances judged to constitute the latter category included parental separation or divorce and the absence of a parent through prolonged illness or death; children of unmarried mothers and foster children were also included.

Since the mother may be considered a central character in the child's life, it was considered pertinent to investigate the possibility that her personality and level of "neurotic anxiety" might bear some association with relapse. The mothers of relapsing patients were not found to differ significantly from those of non-relapsing patients with respect to; (1) median raw score for extraversion on the Eysenck Personality Inventory (1),

(1) Published by the University of London Press, Ltd.
(2) median raw score for neuroticism on the EPI, or (3) median score on the Willoughby Personality Schedule (described in chapter five) (appendix E, tables 131 to 133). Since personality and anxiety scales had for practical reasons not been completed in every case, it had been ascertained prior to analysis that cases in which such scale ratings were available were representative of the series.

Treatment: Patients referred to the clinic by their own parents, rather than by other agencies, might have been expected to gain stability of response by virtue of high initial motivation for treatment. No significant association between self-referral and relapse emerged from analysis of the data (appendix E, table 134).

It was considered possible that speed of acquisition and speed of extinction of therapeutically acquired continence might be positively related, and that the duration of initial treatment might be associated with the occurrence of relapse; relapsed patients were however found to have undergone treatment for a median period not significantly different from that of non-relapsed patients, and no significant relationship was apparent between duration of initial treatment and the period of time elapsing between discharge and relapse among the relapsing group (appendix E, tables 135 and 136).

Although the majority of patients in the present series were treated with an enuresis alarm, this was not considered practicable in seven cases, and an alternative treatment was employed (normally, this involved the use of a record chart alone, or the prescription of drugs). These seven patients did not appear significantly more or less likely to relapse than those treated with an alarm.
(appendix E, table 137), although it should be noted that in many cases in which an alarm was employed, other treatment strategies had also been utilised (see chapter two). The prescription of drugs during initial treatment also involving alarm use was not found to be associated with relapse (appendix E, table 138).

No support was found in the present study for the hypothesis that factors possibly antipathetic to the efficient acquisition of continence during treatment might also operate to the detriment of a stable therapeutic response. No significant predominance was found in the relapsing group of; (1) cases in which parents or child failed to cooperate fully in the use of an enuresis alarm where prescribed, (2) cases experiencing the malfunctioning of an enuresis alarm in use, or (3) children failing to awaken satisfactorily to the sound of an enuresis alarm (appendix E, tables 139 to 141). Children reported to be deep sleepers did not predominate significantly in either relapsing or non-relapsing group, and the proportion of appointments not kept during the course of treatment was similar in both groups (appendix E, tables 142 to 143).

Overlearning Therapy

Since in the present study evidence has not been found that any group of treated enuretics is predisposed towards relapse, it becomes imperative that this fundamental inefficiency of behavioural treatment be offset. The attempted use of intermittent reinforcement schedules (Lovibond, 1964) to counter the relapse rate has failed to demonstrate a significant degree of practical success. A further technique that has been suggested to increase the stability of learning is that of "overlearning" the required
responses beyond an acceptable minimum level (Young and Morgan, 1972c;d).

In the treatment of enuresis, two methods of overlearning have been suggested. Yates, (1970) and Lovibond and Coote (1970) describe a technique of prolonging the cure criterion (usually 14 consecutive dry nights) which must be achieved before the child is permitted to sleep without an enuresis alarm. This technique, however, solely affords a cautionary measure should immediate relapse occur, and in no way increases inhibitory control over the micturitional reflex beyond the minimum level required to achieve continence. Lovibond and Coote comment that very few patients experience relapse immediately following attainment of the cure criterion; this method of overlearning can thus be considered to possess no more than a placebo value in the majority of cases.

The second technique of overlearning involves the deliberate increase of fluid intake after initial cure in order to carry the conditioning process beyond the stage of normal control (Mowrer and Mowrer, 1938; Crosby, 1950; Lovibond, 1964). The same concept has been suggested in relation to both drug therapy and "holding" exercises (Muellner, 1960). Lovibond and Coote (1970), however, have rejected the concept of forcing fluids as being unlikely to prove of value. Prior to the present study, no systematic investigation of the effects of overlearning therapy upon relapse had been reported.

Early laboratory studies have demonstrated the efficacy of overlearning beyond criterion in producing increased retention of learned responses in maze learning tasks (Krueger, 1930) and in the memorization of lists of monosyllabic nouns (Krueger, 1929).
In these studies, continuation of overlearning beyond an optimal level tended to produce diminishing returns.

In the conditioning treatment of enuresis, the conditioning process possibility converts threshold tension of the detrusor muscle from an unconditioned stimulus for the unconditioned response of reflex micturition, to a conditioned stimulus for the two conditioned responses of inhibition of micturition and awakening (see chapter one). Once the patient ceases to wet the bed, this conditioning process is effectively halted, the strength of the association between conditioned stimulus and conditioned responses presumably remaining at whatever minimum level is necessary to produce dry nights. It can be hypothesized, therefore, that under these circumstances little margin of learning is present to counteract possible subsequent stresses on the performance of the conditioned responses essential to continence (in terms of excessive anxieties or abnormally high fluid intake).

In order to effect further strengthening of the learned pattern of continent behaviour against the risks of relapse, fluid intake may be considerably increased immediately prior to bedtime, producing the passage of more urine by the kidneys and placing additional stress upon the detrusor muscle. The tolerance of this increased bladder filling without wetting would indicate a functional increase in the prepotency of the learned inhibition of micturition over the voiding reflex. However, if the increased fluid is not tolerated and the child micturates, the resultant stimulus of the enuresis alarm will effect the further conditioning that constitutes an overlearning of the responses requisite for nocturnal bladder control.
Overlearning therapy had been prescribed to an unselected series of Vale Drive patients since 1968, on impressionistic evidence regarding its value. The analysis of its effects was undertaken by the investigator as part of the present study.

In order to effect the overlearning regime, patients were instructed to drink two pints of liquid, or as near to this quantity as possible, within the last hour before retiring. Overlearning therapy was initiated once the patient had achieved the cure criterion of 14 consecutive dry nights, and was continued until this criterion was regained, unless an unacceptably severe recurrence of wetting occurred. The child continued to use the enuresis alarm until being discharged at the conclusion of overlearning therapy.

The sample studied comprised the 101 patients referred during 1969 and discharged as cured prior to 12th May 1971 following treatment by an enuresis alarm. 67 children had been allocated to overlearning therapy on achieving the criterion of cure, the remainder being discharged as cured and thus forming an effective control group. In six cases (9.0 per cent of those allocated to overlearning) the introduction of the overlearning regime produced a relapse of such severity that the regime was withdrawn and the patients discharged on regaining the cure criterion, without recourse to further attempts at effecting overlearning. Thus 61 cases remain in which treatment was concluded with a successful period of overlearning therapy; of these, seven (11.5 per cent) had experienced the withdrawal of an unsuccessful attempt at overlearning at an earlier stage of treatment. Subsequent to discharge, patients were followed-up
at regular intervals by reply-paid letter (see chapter two), the range of follow-up period for this series being three months to a period in excess of two years.

Twenty-three patients (22.8 per cent) relapsed subsequent to discharge. While, however, relapse occurred in 16 (34.8 per cent) of those cases discharged without a final course of overlearning therapy, only seven (12.7 per cent) of those whose discharge followed overlearning were found to have relapsed. Analysis revealed that the relapse rate of patients undergoing a period of overlearning therapy was significantly lower than that for control patients (appendix E, table 144). Investigation of the effects upon relapse of abandoning unsuccessful attempts at overlearning because of a resultant severe breakdown of newly-acquired urinary control, irrespective of whether overlearning was subsequently reintroduced with greater success, revealed no significant association with the probability of eventual relapse following discharge (appendix E, table 145).

Discussion

The problem of relapse being an almost universal accompaniment to the treatment of enuresis, it is of vital theoretical and therapeutic significance to comprehend the nature of instability in treatment response. The results of the present study,

(1) Once the present results were known, a confirmatory study of 344 Vale Drive patients was conducted (Young and Morgan, 1972d). Among 126 patients undergoing a period of overlearning therapy, the relapse rate was found to be 10.3 per cent, compared with 28.9 per cent among non-overlearners. Analysis yielded a chi squared value of 14.95 (df = 1, p < 0.001).
investigating in all 38 factors of possible relevance, support the conclusion that relapse is an occurrence resulting from inefficiencies in treatment itself, and is independent of patient and background variables. Instability of the learned behaviour pattern of incontinence seems to be a function of treatment and not of its recipient, relapse consisting of an extinction of response likely to occur in some 30 per cent of a treated population. The sole effect of those patient variables studied upon relapse seems to be that the older a child is, the more rapidly will his relapse occur, should he in fact relapse.

The results relating to overlearning afford strong support to the theoretical constructs from which the technique is derived, and establish overlearning therapy as an empirically validated technique for the counteraction of the relapse problem. It is further of importance that the regime can apparently be instituted without increasing the likelihood of patient termination of treatment (see chapter four).

Summary

26 children who relapsed after being cured of enuresis at the special investigation clinic were compared with 82 children who were cured but did not relapse. None of 38 patient, background and treatment variables were found to discriminate satisfactorily between the two groups. Within the relapsed group, it was found that younger patients were able to maintain continence for a longer period before relapsing than were the older patients.

A procedure of "overlearning" in which the child is instructed to drink up to two pints of liquid in the last hour before retiring is described as a means of strengthening the resistance of the learned response to extinction and disruption. Overlearning
therapy, allocated to 61 from a series of 101 patients, was found to significantly reduce the relapse rate. Abandoned attempts at overlearning were not found to significantly affect the probability of relapse.
Introduction

In the retrospective phase of the present study, 17.9 per cent of Vale Drive patients were found to fail to attend the clinic for the initial appointment (see chapter three), and 31.6 per cent of those entering treatment were found to terminate treatment by failing three consecutive appointments or notifying the clinic staff that no further appointments were desired (see chapter four). The association of these phenomena with various background factors has been discussed above; the concurrent study of non-attendance and termination permits elucidation of parental explanations of these occurrences.

Method of investigation

All cases satisfying the criteria of non-attendance or of termination between 6th July 1971 and 6th July 1972 were, where necessary, investigated by means of a domiciliary visit undertaken by the present investigator (see chapter two). At these visits, questions were not specifically directed towards possible reasons for non-attendance or termination; this information was in nearly every case offered by parents in response to general enquiry concerning the child's enuresis. In no case were possible explanations suggested by the investigator. Although the domiciliary visiting of non-attending patients was considered to imply a second opportunity for accepting the offer of treatment, the proportion of non-attenders who subsequently entered treatment (18.6 per cent) was no higher than had been the case prior to the commencement of the programme of visits.

Non-attendance

During the period studied, 70 cases of non-attendance occurred;
13 (18.6 per cent) of these patients subsequently renewed contact with the clinic and entered treatment. The explanations given by parents for non-attendance were categorized as listed in table 16 (the initial appointment was failed rather than cancelled unless otherwise indicated, and each case is entered only once).

<table>
<thead>
<tr>
<th>Explanation</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child dry</td>
<td>11</td>
</tr>
<tr>
<td>Child dry (appointment cancelled)</td>
<td>8</td>
</tr>
<tr>
<td>Moved from district</td>
<td>8</td>
</tr>
<tr>
<td>Moved from district (appointment cancelled)</td>
<td>1</td>
</tr>
<tr>
<td>Forgot appointment</td>
<td>7</td>
</tr>
<tr>
<td>Illness of the mother</td>
<td>6</td>
</tr>
<tr>
<td>Appointment letter mislaid or not received</td>
<td>3</td>
</tr>
<tr>
<td>Clash with mother's employment</td>
<td>3</td>
</tr>
<tr>
<td>Mother admitted to hospital</td>
<td>3</td>
</tr>
<tr>
<td>Appointment letter not received owing to change of address within the borough</td>
<td>2</td>
</tr>
<tr>
<td>Unconcern regarding enuresis following improvement</td>
<td>2</td>
</tr>
<tr>
<td>Child too embarrassed to attend clinic</td>
<td>1</td>
</tr>
<tr>
<td>Child too frightened to attend clinic</td>
<td>1</td>
</tr>
<tr>
<td>Clash with holiday plans</td>
<td>1</td>
</tr>
<tr>
<td>Confinement of the mother</td>
<td>1</td>
</tr>
<tr>
<td>Failure to comprehend correspondence</td>
<td>1</td>
</tr>
<tr>
<td>Family isolated through infectious disease</td>
<td>1</td>
</tr>
<tr>
<td>Illness of a sibling</td>
<td>1</td>
</tr>
<tr>
<td>Rejection of treatment on the grounds that enuresis was &quot;discovered&quot; to be an expression of sibling jealousy</td>
<td>1</td>
</tr>
<tr>
<td>Reliance on the medical opinion that the child would &quot;grow out&quot; of enuresis</td>
<td>1</td>
</tr>
<tr>
<td>Transport difficulties</td>
<td>1</td>
</tr>
<tr>
<td>No reason established</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 16: Parental explanations of non-attendance
In only nine cases (12.9 per cent) was intended non-attendance notified to the clinic staff by cancellation of the initial appointment. In many cases, the explanation of non-attendance appears legitimate, although in spite of a domiciliary visit no attempt was made to secure a further appointment at the clinic. Both the problem of enuresis and the inconveniences of therapeutic procedures and clinic attendance impose demands upon the family, and discussion with parents indicated that the perceived relative "cost" of enuresis and of its treatment varied markedly from one family to another. In a large number of the cases investigated, it was apparent that poor motivation for treatment and a degree of familial disorganization had contributed to a situation in which the inconvenience of remembering appointments and attending a clinic had prevailed to culminate in non-attendance, even when renewal of contact with the clinic had been offered. The differing perceptions of the costliness of behaviour problems and of their treatment has been dramatically underlined in the wider field of child guidance through the recent survey conducted by Shepherd, Oppenheim and Mitchell (1966). The poor motivation of many parents investigated in the present study appeared to derive from the beliefs that "children grow out of bedwetting without any help", and that enuresis is merely an expression of laziness which a child may voluntarily eliminate by "trying harder." Many seemed to regard the often daily wash of wet sheets as less onerous than the prospect of regular clinic attendance. In three cases the mother admitted that she felt unable to cope with treatment.
Remission of enuresis, the forgetting of appointments, departure from the district and illness of the mother together account for over one half of those cases of non-attendance due to failed rather than cancelled appointments. It is striking that problems of transport were given as the major explanation of non-attendance in only one case, although many referred to the inconvenience of a long journey as a secondary factor.

Remission of enuresis

Since the largest single category of non-attenders was found to consist of cases in which enuresis had remitted while the patient was on the waiting list for treatment, further study was made of this phenomenon. Full data were obtained for all patients transferred from the waiting list during the 10-month period 6th July 1971 to 4th May 1972. The median waiting period, from referral to initial appointment, for Vale Drive patients was found in the retrospective phase to be 14.5 weeks (range 0 to 37 weeks). The series comprised 217 patients referred for nocturnal enuresis, falling into the following categories:

<table>
<thead>
<tr>
<th>Category</th>
<th>Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entered treatment</td>
<td>153</td>
<td>70.5%</td>
</tr>
<tr>
<td>Failed to attend (child dry)</td>
<td>9</td>
<td>4.2%</td>
</tr>
<tr>
<td>Failed to attend (other reasons)</td>
<td>39</td>
<td>18.0%</td>
</tr>
<tr>
<td>Withdrawn before initial appointment (child dry)</td>
<td>8</td>
<td>3.7%</td>
</tr>
<tr>
<td>Withdrawn before initial appointment (other reasons)</td>
<td>4</td>
<td>1.8%</td>
</tr>
<tr>
<td>Found to be dry at initial appointment</td>
<td>4</td>
<td>1.8%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>217</td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Twenty-one patients were found to have become dry while awaiting treatment, representing a remission rate of 9.7 per cent,
the median waiting-list period at the clinic being 14.5 weeks (from retrospective phase data). This percentage remission may be compared with the retrospective phase findings that 50 per cent of those entering and remaining in treatment at the Vale Drive clinic achieve the initial cure criterion of 14 consecutive dry nights within 17.6 weeks. It must be emphasized that patients on the waiting list were aware that they were awaiting treatment, and that record charts of wet and dry nights were being maintained. In some cases, it was also apparent that children were receiving treatment of various kinds from their general practitioners pending their first appointment at the clinic. The figure of 9.7 per cent thus represents a "waiting-list," rather than "spontaneous," remission rate.

Since the interviewing of the parents of non-attenders indicated a generally poor motivation for treatment among these cases, it was hypothesized that non-attenders may be less severely enuretic at the time of the first appointment than those who attend this appointment. Information was therefore obtained regarding the severity of enuresis of non-attending patients at the time of appointment failure for comparison with that of attending patients on entry into treatment. This information was in most cases obtained by means of the domiciliary visit. The series comprised all non-attending children failing appointments between 6th July 1971 and 6th July 1972, and found to be still enuretic (35 cases), together with all those entering treatment between 6th July 1971 and 4th May 1972 (152 cases). Information was not available for a further 16 non-attenders and one patient entering treatment. Non-attenders were found to have significantly
fewer wet nights per week than those entering treatment (appendix E, table 146), thus confirming the hypothesis.

**Termination**

Sixty three cases of termination of treatment without clinic approval occurred between 6th July 1971 and 6th July 1972. In 11 cases (17.5 per cent) the clinic staff were notified that no further appointments were desired, the remaining 52 patients merely ceasing to attend the clinic. Table 17 presents a summary of the parental explanation of termination in each case.

**Case No.**

1. No apparent explanation of termination; parent unaware of current severity of enuresis.
2. Mother looking after sister's children.
4. Mother unable to prevent abuse of alarm by patient and siblings. Alarm not used and hidden for safety.
5. Transport difficulties and dissatisfaction with treatment (withdrawal notified by telephone).
6. Alarm not in use; child unconcerned regarding enuresis.
7. Alarm failed to waken child.
10. Mother unaware of current severity of enuresis. Transport difficulties.
11. Mother considers the child "too retarded" for treatment (withdrawal notified by telephone).
13. Diurnal wetting worsened at time of only clinic attendance. Parents considered attendance at the clinic to represent excessive attention.
15. Alarm failed to waken child.
16. Family temporarily abroad.
17. Alarm failed to waken child.
19 Guests staying with family. Alarm not in use.
20 Clinic attendance interfered with schooling (withdrawal notified by telephone).
21 Transport difficulties. Clinic attendance interfered with schooling.
22 Change of address within the borough (subsequently notified to the clinic staff).
23 Clinic attendance interfered with mother's work.
24 Child dry.
25 Satisfied with moderate improvement in child's condition.
26 Child recovering from an accident (withdrawal notified by telephone).
27 Child dry (withdrawal notified at clinic).
28 Child dry.
29 Illness of the mother, who finds treatment "too much".
30 Departed from borough.
31 Child afraid of alarm. Alarm never used (withdrawal notified at clinic).
32 Child dry.
33 Mother considers enuresis to be "psychological" (withdrawal notified at clinic).
34 Alarm failed to waken child. Alarm not in use. Clinic attendance interfered with mother's work.
35 Illness of the mother.
36 Satisfied with improvement in child's condition. Clinic attendance interfered with mother's work.
37 Not satisfied with rate of progress.
38 Not satisfied with rate of progress.
39 Child afraid of alarm. Little progress in treatment (withdrawal notified at clinic).
40 Mother nursing sick relative.
41 Child dry (withdrawal notified at clinic).
42 Use of alarm and clinic attendance "too much trouble", and interfered with mother's work. Alarm never used.
43 Child dry.
44 Not satisfied with rate of progress. Alarm not used properly.
45 Satisfied with improvement in child's condition. Alarm not in use.
Case No.
46 Satisfied with improvement in child's condition. Clinic attendance interfered with schooling.
47 Admission of sibling to hospital.
48 Satisfied with improvement in child's condition.
49 Illness of the mother.
50 Child dry (withdrawal notified by telephone).
51 Child dry.
52 Child dry without alarm. Alarm not in use and broken.
53 Satisfied with improvement in child's condition. Child embarrassed by alarm.
54 Persistent illness of family. Alarm inoperative.
55 Parents non-cooperative (child brought to clinic by social worker). Alarm not in use.
56 Persistent illness of family. Transport difficulties.
57 Departed from borough.
58 Illness of mother.
59 Alarm failed to waken child. Siblings prevented use of alarm.
60 Termination of retreatment following relapse. Not satisfied with progress (withdrawal notified by telephone).
61 Clinic attendance interfered with mother's work.
62 Child dry. Mother forgot appointments.
63 Mother forgot appointments. Child improved.

Table 17: Parental explanations of termination

It is notable that transport difficulties, found to be a minor problem in chapter three, were offered as a major explanation of termination in only five cases (7.9 per cent), interference with schooling in three cases (4.8 per cent) and interference with the mother's employment in five cases. Illness in the family was cited as the major explanation in 10 cases (15.9 per cent), and two patients had left the borough (3.2 per cent).

In four cases (6.4 per cent) the parents disagreed with the methods of treatment employed, while in a further five cases
dissatisfaction with the child's rate of progress in treatment was offered as the primary reason for termination. Four parents stated that the alarm frightened the child, and another that its use embarrassed the patient. Cessation of wetting, sufficient to satisfy the clinic's initial cure criterion of 14 consecutive dry nights, was reported in 12 cases (19.1 per cent); a further seven parents (11.2 per cent) were satisfied with merely a reduction of wetting frequency. Only five parents terminated their children's treatment because of the failure of the alarm to waken the child, although others referred to this problem as a secondary factor. It was apparent that in many cases the alarm was no longer in use, although the number of parents who stated this is unlikely to be reliable; some had difficulty in finding the alarm when its return was requested, and others claimed that alarms which were no longer in working order were nevertheless still in use.

Discussion

Certain biasses regarding the reasons elicited for non-attendance and termination may derive from the fact that in most cases the reasons are those given by parents to the investigator during an official domiciliary visit. The explanations recorded were, however, those supplied spontaneously in response to general and open-ended enquiry.

In the retrospective phase it was found that the linear distance between the child's home and the clinic bore no significant association with the phenomena of non-attendance (see chapter three) or termination (see chapter four). The small number of cases in which transport difficulties were in the concurrent study
stated to be a major explanation of non-attendance or termination supports this earlier finding; it seems unlikely that decentralization of clinic facilities in a highly populated urban area would markedly reduce these problems.

The finding that non-attending patients are as a group less severely enuretic at the time of the arranged first appointment than are patients who enter treatment permits two possible explanations. It may be that non-attending patients tend to be those whose enuresis was less severe, even at the referral stage, or that non-attenders tend to be those children making most response to the influences of the waiting-list period. Perhaps the most effective means of counteracting the wastage of appointment time through non-attendance would be to require parental confirmation that an appointment is still desired shortly before the date of the initial appointment.

Summary

A summary is given of parental explanations of failure to attend for the treatment of childhood enuresis at Vale Drive clinic, and of premature termination of treatment. A 9.7 per cent remission rate of enuresis while awaiting treatment is reported; the median waiting period at the clinic being 14.5 weeks (from retrospective phase data). Non-attending patients were found to be significantly less severely enuretic than those entering treatment at the time of the initial appointment. 19.1 per cent of terminating patients were found to be dry.
8. EXPECTANCIES AND THERAPEUTIC OUTCOME
(CONCURRENT PHASE)

Introduction

There is sound evidence that patient prognostic expectancies and therapeutic outcome may be related in many forms of therapy, expectancy factors possibly associating with a differential placebo response (Goldstein, 1962; Shapiro, 1971). Shapiro, in his recent comprehensive review of evidence concerning placebo effects, notes that such factors may be of much importance in therapies involving impressive and complicated procedures, particularly where the clinical context is also impressive and the therapists enthusiastic and persuasive. It is thus conceivable that the treatment of childhood enuresis in the context of the special investigation clinic described in chapter two may be affected to some extent by patient and parent prognostic expectancies. The present chapter reports the investigation of such expectancy factors and their possible relationship with the outcome categories of termination, rapid and slow therapeutic response, and also of the possible association of expectancy of relapse with the occurrence of relapse.

Studies of expectancy factors in psychotherapy have led to the general conclusion (Goldstein, 1962; Shapiro, 1971) that there may be a curvilinear relationship between patient prognostic expectancies and subsequent therapeutic outcome, patients having extreme expectancies benefitting least from therapy. It is also probable that remaining in treatment, of a psychotherapeutic nature at least, may be related to a congruence of patient and therapist expectancies (Goldstein, 1962; Shapiro, 1971). Aronson and Overall (1966) quote evidence indicating that high initial
expectancy of therapeutic success may constitute a predictor of dropout rather than of successful outcome, and Gliedman (1957) has made the interesting point that patients dropping out from psychotherapy frequently appear to do so at the conclusion of their anticipated period of treatment. In chapter four of the present study, it was found that the duration of contact with the clinic for terminating patients was not significantly different from the total duration of treatment for successful cases.

Investigations relating to the possible implications of expectancy variables in behaviour therapy have yielded conflicting results, and have tended to concentrate largely upon analogue studies involving the systematic desensitization of snake phobia in non-psychiatric subjects. Conclusive data relating to the relevance of expectancy effects with patients in field situations is thus not yet available, and care must be exercised in generalization from the evidence that is available. Lomont and Brock (1971) failed to discover any effect upon therapeutic outcome when systematic desensitization of snake fear was presented as an established therapy or as a treatment of unknown efficacy, nor was explanation of the rationale of treatment found to influence its outcome. McGlynn and Mapp (1970) found no influence upon the efficacy of tape-recorded desensitization of snake-avoidance of different instructions regarding the anticipated outcome of treatment, although McGlynn, Reynolds and Linder (1971) subsequently reported a limited therapeutic effect of both pre- and intra-treatment instructions in this form of therapy, instructed groups improving significantly over control while non-instructed groups did not. Oliveau et al. (1969) have found evidence supporting the
suggestion that emphasis upon defining and attaining specific behavioural objectives may facilitate learning in a therapeutic context. In a further study, McGlynn (1972) manipulated the pre-treatment prognostic expectancy of 20 snake-avoidant female students, obtaining results indicating that expectancy manipulation had no impact upon the efficacy of experimental desensitization.

Reviewing the literature relating to experimentally induced expectancies, McGlynn concludes that a subject's expectancy of success or failure does not appear to influence the outcome of experimental desensitization; it is however worthy of note that all the above studies concern expectancies which have been deliberately manipulated for experimental purposes, whereas in a clinical setting it is the expectancy brought by the patient into the therapeutic situation which is of paramount importance in any investigation of possible expectancy effects.

Studying patient prognostic expectancies held by volunteer subjects entering treatment for excessive smoking, Koenig and Masters (1965) found expectation of therapeutic success rated on a 10-point scale to be significantly related to actual therapeutic response, suggesting therefore the possible validity of investigating non-manipulated expectancies in predicting outcome. In addition to clinical findings there is some evidence that expectancy factors may be associated with markedly different results in laboratory tasks such as classical eyelid conditioning (Gormezano and Moore, 1962).

Expectancy variables have not been systematically investigated in the context of the treatment of childhood enuresis, although non-specific treatment effects have frequently been noted
It has been suggested (Shapiro, 1971) that expectancy factors may be of relevance to non-specific treatment effects in psychotherapy, exerting a facilitative or predisposing effect. In controlled trials of propantheline bromide (Pro-Banthine) and posterior pituitary snuff (Di-Sipidin) in the treatment of enuresis, Jones and Tibbetts (1959) noted a strong placebo effect, and in an early controlled trial of conditioning treatment for enuresis, De Leon and Mandell (1966) noted an "instructional effect" deriving apparently from the knowledge that treatment would be given. Peterson, Wright and Hanlon (1969), also in a controlled trial of conditioning treatment, concluded that therapeutic progress might be assisted by factors such as expectations of being helped and a placebo effect.

Method of investigation

The mothers' and patients' expectancies of therapeutic outcome were assessed at the first appointment prior to the initiation of treatment for all cases first seen between 6th July 1971 and 6th July 1972 in which satisfactory responses could be obtained. No attempt was made to manipulate expectancies, and ratings were obtained under similar conditions at the same stage during the initial appointment in all cases. The parental expectancy scale (PE) and child expectancy scale (CE), which are reproduced and fully described in appendix D, were in almost every case presented to the mother and patient respectively by the investigator in person. For practical reasons mother and child were together during the interview and thus may have unavoidably influenced each other's responses, although they were strongly discouraged from

- 171 -
commenting upon each other's responses. Where possible, the scales were administered in written rather than oral form. Overt influence in fact appeared negligible, mothers rarely commenting upon their children's responses even where the children's scale was administered orally. The mode of presentation was standard, having been developed during a pilot stage of the research, and is described in appendix D. The parental scale was omitted if a person other than the mother accompanied the child to the clinic at the first appointment, but was administered to foster mothers or houseparents if these were obviously the child's long-term mother surrogates. Administration of the scales was attempted with every mother and child, and only abandoned if it became apparent that the subject was unable to comprehend or respond to the scale. This proved to be the case for some immigrant families, and for some very young children; although even some four year-olds demonstrated an acceptable level of comprehension.

Satisfactorily completed rating scales were obtained from 139 of the mothers and 129 of the children among the 153 cases first seen during the period studied. The five-alternative multiple-choice PE and CE scales yielded ratings of prognostic expectancies on a five-point scale in each case. The expectancies so rated were pre-treatment expectancies rather than expectancies generated or amended in response to actual experience of treatment; in the terminology of Cartwright and Cartwright (1958) they represent "entering belief" rather than "produced belief".

The chi-squared test (Siegel, 1956) was selected as the most suitable non-parametric test for the analysis of expectancy data,
being sensitive to location, dispersion and skew in addition to central tendency. The analysis employed thus allows consideration of the hypothesis that extreme expectancies may bear an association with certain therapeutic outcomes.

In addition to the assessment of prognostic expectancies, the expectancy of relapse was assessed for both mother (PRE) and child (CRE) at discharge from the clinic following initial arrest of enuresis. Expectancies of relapse were assessed by means of five-alternative multiple-choice questions similar to those employed in relation to prognostic expectancy (see appendix D). No attempt to manipulate expectancy of relapse was made, and the chi-squared statistic was again employed in analysis. Ratings of expectancy of relapse were obtained where possible for all cases discharged between 6th July 1971 and 6th July 1972, suitable ratings being obtained from 124 mothers and 144 children. The total number of cases discharged during the period studied was 149, the mother's (PRE) rating being unobtainable in cases where the child was attending the clinic alone or accompanied by the father only; while the mother usually accompanied the child at his first appointment, she was in some cases not present at subsequent appointments. Patients constituting the series studied in connection with expectancy of relapse were followed up by reply-paid letter for a minimum period of five months following discharge, although in many cases relapse was notified to the clinic by telephone.

Prognostic and relapse expectancy ratings were analysed with respect to certain patient background factors, and to the outcome categories of termination, slow and rapid response to treatment.
and relapse, as defined in chapter two.

Results

Prognostic expectancy: The possibility of an association between the maternal and patient expectancy ratings (PE and CE respectively) and various background factors was investigated. No significant associations were however found between either rating and either social class or the sex of the patient (appendix E, tables 147 to 150). While the maternal expectancy rating (PE) was not found to be associated significantly with the age of the patient (appendix E, table 151) the child's own expectancy rating was found to be significantly associated with age, generally tending to be higher among older children (appendix E, table 152). Table 18 sets out the mean ages of children scoring at different levels on the CE rating.

<table>
<thead>
<tr>
<th>CE score</th>
<th>n</th>
<th>Mean age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and 2 (low expectancy)</td>
<td>11</td>
<td>6.18</td>
</tr>
<tr>
<td>3</td>
<td>23</td>
<td>6.57</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>8.25</td>
</tr>
<tr>
<td>5 (high expectancy)</td>
<td>55</td>
<td>7.18</td>
</tr>
<tr>
<td></td>
<td>129</td>
<td></td>
</tr>
</tbody>
</table>

Table 18: Age and CE score

No significant association was apparent between either CE or PE rating and the severity of the child's enuresis measured in terms of wet nights per week (appendix E, tables 153 and 154), and the child's CE score was not significantly associated with a diagnosis of primary or secondary enuresis (appendix E, table 155); the data concerning PE ratings and diagnostic category were not suitable for analysis, there being an insufficient number of secondary enuretics. Neither CE nor PE ratings were significantly
associated with the report of a positive family history of enuresis amongst parents or siblings (appendix E, tables 156 and 157). Maternal and child expectancy ratings were found to be significantly and positively associated (appendix E, table 158).

Maternal expectancy scores were not found to be significantly associated with termination, nor to discriminate significantly between slow and rapid response groups (appendix E, tables 159 and 160). The patient expectancy rating (CE) failed to discriminate significantly between slow and rapid groups (appendix E, table 161) although a significant association did emerge between termination and patient prognostic expectancy as rated by the CE (appendix E, table 162), terminators tending to have a lower expectancy of therapeutic success. No significant associations were discovered between either expectancy rating and the duration of clinic attendance in terminating cases, nor the severity of enuresis in these cases at the time of termination (revealed by domiciliary visiting) (appendix E, tables 163 to 166).

Relapse expectancy: It was expected that the maternal and patient ratings of relapse expectancy (assessed by means of the PRE and CRE respectively) might be affected by the prior experience of relapse in cases being discharged for the second or subsequent time. No significant association was however discovered between CRE or PRE scores and the prior experience of relapse following discharge from the Vale Drive clinic (appendix E, tables 167 and 168). Neither maternal nor patient relapse expectancy ratings were found to be significantly associated with known subsequent relapse (appendix E, tables 169 to 170), nor was
either rating found to be significantly associated with the rapidity of relapse (time elapsing between discharge and the first appointment given for retreatment) among relapsed cases (appendix E, tables 171 and 172).

Discussion

The results of the present study do not support the view that the pre-treatment prognostic expectancies of mother or child patient, as assessed, are of general prognostic relevance in the treatment of childhood enuresis at a behaviourally oriented clinic. The finding that expectancies of relapse are not strongly associated with the subsequent occurrence of relapse is in accord with the conclusion drawn in chapter six that relapse may be more appropriately regarded as an instability inherent in the treatment process than a function of patient variables.

The general lack of a significant and consistent association of expectancy ratings with outcome may indicate an actual absence of weakness of association between expectancy factors and outcome, or may be merely indicative of the crudity of the rating scales employed. The one significant finding to emerge between an expectancy rating and an outcome category is that between the child's CE score and the subsequent termination of treatment, a low expectancy of therapeutic success on the part of the child being generally prognostic of termination. Termination of treatment may probably be considered as primarily an act of the parent rather than the child, and it may be that the discovery of a significant association between termination and the child's prognostic expectancy but not parental expectancy is due to a greater readiness of children to report low
expectancies. It is however also conceivable that a low
prognostic expectancy on the part of the child is related to the
less favourable therapeutic response of terminating patients
reported in chapter four. If this interpretation is correct,
differentiation must be made between the poorly responding
potential terminators and the poorly responding children of the
"slow response" category, whose CE scores failed to differentiate
them at a significant level from the rapid responders. Neither
explanation of the finding, in terms of a low prognostic
expectancy in the family which is only so simply detectable in
the child, or in terms of the poor therapeutic response of the
terminator being possibly consequent upon low patient expectancy,
can be considered fully satisfactory. In addition, evidence was
not found of any curvilinear associations between expectancies
and outcome categories by means of chi-squared analysis. Further
research, employing more sensitive measures of expectancies, is
required before the hypothesized implication of prognostic
expectancies in the non-specific element encountered in the
treatment of enuresis can be ascertained with confidence; a low
CE score may however be regarded as a possible predictor of
termination on purely empirical grounds, and deserves further
consideration as such.

Since a significant association was found between maternal
and child prognostic expectancy ratings, it would be prudent in
future investigations for such scales to be completed by mother
and child separately, which was not practicable at Vale Drive
clinic. Only in this manner may the observed association be
attributed to either an influence of mother and child upon
each other's completion of the rating scales, or a genuine
congruence of maternal and child expectancies.

Two plausible hypotheses may be presented in interpreting the association between the child's age and his CE score: it may be that older children are genuinely more optimistic concerning the expected outcome of treatment (and may also be more aware of being enuretic and more desirous of relief from the disorder), or it may be that tendencies towards social conformity render older children more likely to give more apparently acceptable answers to questions relating to prognostic expectancy - which may also be the case among their mothers.

In conclusion, it may be said that expectancy factors cannot on the present evidence be regarded as being of prognostic relevance in the treatment of enuresis, although the prognostic expectancy held by the child patient on entering treatment would appear to be a possible predictor of termination, indicating the desirability of special attention to therapeutic difficulties encountered in cases having low CE scores in an attempt to avert termination.

Summary

Expectancy factors have been found of relevance to outcome in various therapeutic contexts, although the evidence is not conclusive. Patient and maternal prognostic expectancies, and expectancies of relapse, were investigated with respect to various patient and background factors, and to the outcome categories of slow and rapid response, termination, and relapse. Patient prognostic expectancy was found to be significantly associated with termination, and significantly and positively associated with the child's age. Parental and patient prognostic expectancies
were found to be significantly associated. These findings are discussed, and the patient prognostic expectancy (CE) rating is noted as a possible predictor of subsequent termination.
9. ANXIETY AND THERAPEUTIC OUTCOME
(CONCURRENT PHASE)

Introduction

In chapter one, experimental evidence was reviewed which indicated an association, probably curvilinear, between the performance of certain learning tasks and anxiety, and a tentative aetiological model for enuresis invoking the "Yerkes-Dodson" formulation was discussed. It was therefore hypothesized that the anxiety of the child patient might be related to his speed of response to treatment in the clinical setting studied. The possibility of associations between the child's anxiety level and various background factors was also investigated.

In the retrospective phase (see chapter five), it was found that the mothers of slow-responding patients yielded significantly higher scores for anxiety on the Willoughby Personality Schedule (Willoughby, 1932; 1934; Wolpe, 1958), when tested in the early stages of treatment, than did the mothers of rapidly responding patients. Maternal anxiety, as measured by the WPS, thus emerges as a factor of prognostic relevance, although the mechanisms involved in its implication in the speed of therapeutic response are uncertain. In the present chapter, WPS scores are compared with the maternal and patient prognostic expectancy ratings obtained concerning concurrent phase patients (see chapter eight).

Method of investigation

The anxiety of children included in the present study was assessed by means of the Children's Manifest Anxiety Scale (CMAS), developed by Castaneda, McCandless and Palermo (1956), in a slightly modified form. The CMAS is a derivative of the Taylor
Manifest Anxiety Scale (Taylor, 1953), originally developed to indicate drive level in order to investigate its relevance in eyelid conditioning tasks. The CMAS, like its parent test, the Taylor MAS, is a measure of "Trait" anxiety; a general predisposition to anxiety reactions rather than a specific situationally determined "state" of anxiety (Spielberger, 1966; Levitt, 1967). The assumption made by Taylor (1953) and by Castaneda, McCandless and Palermo (1956) that a "manifest anxiety scale" may afford a measurement of drive level suitable for the experimental study of the role of drive in a learning task was repeated in the present study, in respect of a possible empirical association between obtained CMAS scores and the speed of therapeutic response.

During the concurrent phase of the research, the Willoughby Personality Schedule was routinely issued to the mothers of patients for completion at home during an early stage in treatment, as had been the case during the retrospective phase. The Children's Manifest Anxiety Scale was issued at the same time during the concurrent phase; it was not practicable for the scale to be completed during the extended initial appointment because of the limitation of time available at the clinic. The established clinic practice of issuing scales for completion at home was therefore extended to include the CMAS. For purely practical reasons, it was thus necessary to accept anxiety ratings obtained under less controlled conditions than those under which other ratings were obtained at the clinic.

The CMAS is a 42-item scale requiring the child to indicate positive or negative responses to each item by encircling the word "YES" or "NO". The lie scale of the original version was
omitted for the purposes of the present study, on the grounds that empirical associations between only the anxiety score and other variables were being sought, and that insufficient normative data had been published for the value of the lie scale to be ascertained; subsequently published English normative data (Colman, Mackay and Fidell, 1972) is limited to children aged 11 and 12, whereas in the present study the age range was broadened to include any child in the series who appear capable of completing the scale, administered orally or in written form. Where oral administration at home appeared necessary, the mother was cautioned not to "lead" the child - although the extent to which mothers influenced their children's responses cannot be ascertained. Minor modifications of wording were made to certain items of the CMAS where the terminology appeared inappropriate for British use; the modified version of the scale is reproduced in Appendix F.

Ninety eight completed CMAS forms were returned to the clinic from among the 153 cases of the concurrent series. Because of the large number of forms not returned, a preliminary analysis was conducted to ascertain the acceptability of the data obtained. A comparable proportion of slow and of rapid responders were found to have returned the completed CMAS form to the clinic, although a significantly higher proportion of terminators than non-terminators had failed to do so; analysis of CMAS scores was therefore limited to the outcome categories of slow and rapid response only.

Results

Comparison of the median CMAS scores of the slow and rapid
response groups yielded no significant difference (appendix E, table 173), thus failing to support the hypothesis that slow responding patients should yield higher CMAS scores. The hypothesis, deriving from the Yerkes-Dodson formulations (see chapter one), that slow response should be associated with scores at either end of the distribution of CMAS scores was similarly unsupported; inspection of the data did not indicate a preponderance of children with extreme scores in the slow response group.

The possibility of associations between patient anxiety as measured and patient background factors relating to enuresis was investigated, no significant associations being found however between CMAS score and (1) the severity of enuresis in terms of wet nights per week, (2) a diagnosis of primary or of secondary enuresis, or (3) a positive family history of enuresis among parents or siblings (appendix E, tables 174 to 176).

It was considered possible that the prognostic expectancy ratings obtained from mothers and children (see chapter eight) might be associated with measured anxiety. No significant associations were however found between; (1) maternal prognostic expectancy (PE) and the mother's score on the Willoughby Personality Schedule (WPS), (2) maternal prognostic expectancy and the child's CMAS score, (3) patient prognostic expectancy (CE) and the mother's WPS score, or (4) patient prognostic expectancy and the child's CMAS score, (appendix E, tables 177 to 180).

Discussion

In considering the above results, it is important to bear in mind the limitations of paper-and-pencil measures of anxiety administered under conditions which may be considered far from
ideal. It is noteworthy, however, that the investigation of scores obtained from the CMAS, a scale that has been employed in experimental investigations of the role of anxiety in learning (Castaneda, Palermo and McCandless, 1956; Palermo, Castaneda and McCandless, 1956) and is derived from the manifest anxiety scale widely employed in such work (Taylor, 1953; 1956), failed to differentiate slow from rapid responders in the present study. Although the present evidence can by no means be considered conclusive, it does not support the contention that a child's anxiety, as measured, can be regarded as a factor relevant to his rate of response to the treatment of enuresis in the context studied. The present result also fails to support the extension of the "Yerkes-Dodson" model (Young, 1965d; Morgan and Young, 1972; 1973), discussed in chapter one, to a clinical treatment setting; although it should be emphasized that the series studied were not exclusively treated by conditioning techniques (see chapter two) and the role of anxiety was not therefore being investigated in a pure learning situation.

It has frequently been suggested that emotional difficulties may in many cases be secondary to enuresis (Davidson and Douglass 1950; Cust, 1958; Bakwin, 1961; Lovibond, 1964; Yates, 1970), and that anxiety factors may precipitate enuresis of the "onset" or secondary type (Hallgren, 1957; Young, 1965d; MacKeith, 1968; Morgan and Young, 1972; 1973). Trait anxiety as measured by the CMAS, however, appears in the light of the present data to remain independent of the diagnostic type and the severity of enuresis among enuretic clinic patients. Primary and Secondary enuretics are not differentiated by CMAS score, although since English
normative data is not available for the age range studied, and no non-enuretic comparison group was available, it could be that anxiety is implicated in both types of enuresis to a comparable degree, conceivably of a precipitating nature among secondary enuretics and of a primarily reactive nature among primary enuretics. It is also possible that the CMAS is an insufficiently appropriate or sensitive measure, and that a test of state anxiety might yield different results with regard to the nature and history of the disorder, particularly if administered outside a treatment setting and, in the case of secondary enuretics, temporally close to the onset of incontinence.

While the findings reported in the present chapter afford neither support for nor refutation of the value of the concept of "anxiety" or "drive" in constructing an aetiological model for enuresis great caution is indicated in consideration of the role of such a concept in treating the disorder.

Summary

Investigation of scores obtained from enuretic patients on the Children's Manifest Anxiety Scale failed to support the hypothesis that anxiety, as measured, may be associated with the speed of therapeutic response. CMAS score was not found to be associated with the nature or history of the child's enuresis. Maternal and child prognostic expectancies were not found to be related to either the mother's WPS score or the child's CMAS score.
10. ATTITUDES AND THERAPEUTIC OUTCOME
(CONCURRENT PHASE)

Introduction

Clinical experience suggests that parental attitudes towards childhood enuresis may vary from tolerant concern to punitive intolerance, and those of the enuretic child from nonchalance to extremes of embarrassment. The treatment of enuresis at a clinic employing predominantly conditioning techniques relies heavily upon the full cooperation of parents and child, and it may be hypothesized that their respective attitudes towards enuresis may be implicated in the response to therapy.

In chapter four, it was suggested that failure to progress in treatment, culminating in patient termination of treatment, may be related to antipathetic familial attitudes which preclude the consistency and persistence of cooperation with treatment which is a prerequisite of therapeutic success. A positive association was found between termination and a positive family history of enuresis, an association which may give rise to a hypothesis of inappropriate familial attitudes towards enuresis deriving from familiarity with the disorder in other members of the family. The exploration of maternal and child attitudes towards enuresis in the concurrent phase of the present investigation permits consideration of the possible implication of such factors, as measured, in the treatment of enuresis. The possible association of such attitudinal factors with certain background factors, including positive family history of enuresis, is also investigated.

It is conceivable that parental attitude on the dimension of tolerance/intolerance of enuresis, and patient attitude on the
dimension of concern/unconcern regarding enuresis may indicate factors of motivational significance in treatment. It has been reported (Luborsky et al., 1971) that in general, amount of motivation and/or expectation tends to be positively related to outcome in psychotherapy. Furthermore, Ross and Lacey (1961) have investigated treatment termination at a child guidance clinic, and note that parental motivation to keep children in treatment appeared to be a function of the distress caused by the symptom.

In relation to the specific disorder of childhood enuresis, Cust (1958) has reported that from a series of 20 cases, 12 children were "upset" by the problem and attempted to conceal it from those outside their immediate family circle. Seventeen of the mothers were said to be "worried" by the disorder, 16 complaining of the extra washing involved. Hallgren (1957) has found parental intolerance towards the enuretic child to be significantly more common amongst cases complicated by diurnal urinary incontinence, and among the parents of male rather than female enuretics. It is also conceivable that attitudinal factors may be implicated in the non-specific aspects of the treatment of enuresis, which have been frequently reported (De Leon and Mandell, 1966; Baker, 1969; Peterson Wright and Hanlon, 1969; Turner, Young and Rachman, 1970; Turner, 1971), and that they may facilitate or impede any learning processes involved in treatment.

Apart from the variables of maternal intolerance and child concern regarding enuresis, it was considered that a simple rating of the "nuisance value" attached to enuresis by the mother might further elaborate the implications of maternal attitude towards enuresis.
Method of investigation

The mothers' intolerance and the patients' concern regarding enuresis were assessed at the first appointment (prior to the initiation of treatment) for all cases first seen between 6th July 1971 and 6th July 1972, in which satisfactory responses could be obtained. The scales employed were the Parental Intolerance Scale (PIS) and the Child Concern Scale (CCS), both developed for use in the present study. The scales themselves are reproduced in appendices A and B, where the process of validation is also described. The mode of presentation of the scales was standard (see appendices A and B), having been developed during a pilot stage of the research, and no attempt was made to manipulate attitudes. Attitude scales were administered to mothers and children, in almost every case by the investigator in person, at the same interview as described in chapter eight with regard to the expectancy ratings. The discussion of the administration of expectancy scales to mother and child together in oral form if necessary, thus applies equally to the PIS and CCS (see chapter eight). Maternal rather than paternal attitudes were assessed because patients were more usually accompanied to the clinic by their mothers, and since the implications of coping with an enuretic child may be different for each parent, the PIS was specifically designed for completion by mothers. The PIS was administered to foster mothers or houseparents if these were obviously the child's long-term mother surrogates. Where possible, attitude scales were completed by the subject working alone, but for many children and some illiterate or immigrant mothers they were administered orally by the investigator.
Administration of the PIS and CCS was attempted with every mother and child first seen during the period studied, and was only abandoned where it was apparent that the subject was unable to comprehend or respond to the scale. One hundred and fifty three children were included in the series, satisfactorily completed CCS forms being obtained in 120 cases. Satisfactorily completed PIS forms were obtained from 134 mothers.

The "nuisance value" of enuresis, as perceived by the mother, was assessed by means of a check-list of 25 common childhood problems (the NV form). The NV was given to every mother of the 153 cases first seen during the period studied who attended the clinic with her child, satisfactorily completed forms being returned by 108 mothers. Because the NV form was issued to mothers at an early stage in treatment for completion at home, together with the CMAS (see chapter nine), the proportion of forms not returned to the clinic was high among rapidly terminating cases. Since a preliminary analysis revealed a significant predominance of cases in which NV ratings were not available in the terminator group, analyses involving the NV were confined to the slow and rapid response groups, which were found to be comparable with regard to the proportion of cases failing to return NV forms to the clinic. Details of the NV rating and its mode of presentation are given in appendix C.

Results

Each of the three attitude ratings (CCS, PIS and NV) was analysed with regard to the age and sex of the patient; no significant associations were however discovered between any rating and sex (appendix E, tables 181 to 183), and no significant
correlations emerged between the age of the patient and the PIS or NV rating obtained from the mother (appendix E, tables 184 and 185). A significant positive correlation did however emerge between the age of the child and his concern at being enuretic as indicated on the CCS (appendix E, table 186). The nature and severity of the child's enuresis were not found to be factors relevant to the parental and child attitudes measured, no significant associations being found between the severity of wetting (wet nights per week) and PIS, CCS or NV score (appendix E, tables 187 to 189), or between the diagnosis of primary or secondary enuresis and any of the three ratings (appendix E, tables 190 to 192).

Investigation of attitude and the background factor of social class (classified in accordance with the Classification of Occupations, 1970) yielded no significant association between CCS score and social class (appendix E, table 193), but significant associations between social class and both parental measures of attitude (PIS and NV) (appendix E, tables 194 and 195). The trend was for mothers from the less skilled classes to be both more intolerant of their children's enuresis and to regard bedwetting as a greater nuisance compared with other childhood problems. Tables 19 and 20 present respectively the mean PIS and NV scores obtained from mothers of the various social classes.

<table>
<thead>
<tr>
<th>Social Class</th>
<th>N</th>
<th>Mean PIS score</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>14</td>
<td>1.52</td>
</tr>
<tr>
<td>II</td>
<td>32</td>
<td>1.91</td>
</tr>
<tr>
<td>III non-manual</td>
<td>12</td>
<td>1.72</td>
</tr>
<tr>
<td>III manual</td>
<td>45</td>
<td>1.73</td>
</tr>
<tr>
<td>IV and V</td>
<td>18</td>
<td>2.06</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>121</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 19: Social class and PIS score
Table 20: Social class and NV score

It was hypothesized that in cases where a positive family history of enuresis was reported, familiarity with the disorder might be associated with a characteristic pattern of attitudes. No significant association was found between the mother's PIS or NV score and a reported family history of enuresis (appendix E, tables 196 and 197), but children having a positive family history were found to yield a significantly lower median child concern score on the CCS (appendix E, table 198); the median score for children having a positive family history was 1.43, and for those not having a positive family history the median score was 1.47.

In chapter five, it was reported that maternal scores on the Willoughby Personality Schedule (Willoughby, 1932) were significantly higher among slow than among rapid responding cases, and the possibility of associations between WPS score and the attitudinal variables measured was investigated in the concurrent
phase. The following correlations, however, all failed to reach statistical significance; (1) WPS score with parental intolerance as measured by the PIS ($r_s = 0.16$), (2) WPS score with the Nuisance Value rating ($r_s = -0.09$), and (3) WPS score and child concern as measured by the CCS ($r_s = 0.05$) (appendix E, tables 199 to 201).

The intercorrelations between each of the measures of attitude employed, and the child's anxiety score on the CMAS, are presented in table 21. A statistically significant positive correlation emerged between the child's anxiety (CMAS) score and his concern at being enuretic (CCS score), and a significant negative correlation emerged between the child's CMAS score and the mother's NV score; indicating that mothers of the more anxious children in the series tended to regard enuresis as a relatively severe problem in comparison with those listed on the NV form (see appendix C).

<table>
<thead>
<tr>
<th></th>
<th>PIS</th>
<th>CMAS</th>
<th>NV</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS</td>
<td>0.05</td>
<td>0.22*</td>
<td>0.07</td>
</tr>
<tr>
<td>PIS</td>
<td>0.12</td>
<td>-0.01</td>
<td></td>
</tr>
<tr>
<td>CMAS</td>
<td></td>
<td></td>
<td>-0.23*</td>
</tr>
</tbody>
</table>

*Significant at $p < 0.05$ level

NB: See also appendix E, tables 202 to 207.

Table 21: Intercorrelations of attitude and CMAS scores

Analysis of the present data to elucidate a possible relationship between expectancy and attitudinal factors yielded no supportive findings. No significant associations emerged between patient prognostic expectancy as assessed by the CE question (see chapter eight and appendix A) and; (1) CCS score, (2) PIS score,
or (3) NV score (appendix E, tables 208 to 210). Furthermore, maternal prognostic expectancy (PE) was not significantly associated with any of these three ratings (appendix E, tables 211 to 213).

It was hypothesized that the measured attitudinal variables might be of relevance to the rate of response to treatment, conceivably as facilitatory or inhibitory factors acting directly upon specific therapeutic processes, or as elements inherent in a family context variable in its suitability for the conduct of treatment in the home. Analysis however failed to support this hypothesis, slow and rapid response groups not differing significantly with respect to median scores on (1) the Parental Intolerance Scale, (2) the Nuisance Value form or (3) the Child Concern Scale (appendix E, tables 214 to 216).

In chapter eight, the prognostic expectancy of the child patient was found to associate with termination of treatment, and it was suggested that a low prognostic expectancy might contribute to the generally poor therapeutic response of terminating patients (see chapter four). It was therefore considered pertinent to investigate the possibility that terminators might characteristically differ from those remaining in treatment with regard to their level of concern at the disorder of enuresis. The median CCS score of terminating and non-terminating groups was on analysis, however, found to be comparable (appendix E, table 217). Furthermore, no significant associations were found between CCS score and either the period of clinic attendance prior to termination, or the severity of enuresis (measured in terms of wet nights per week and ascertained by means of
domiciliary visiting) at the time of termination (appendix E, tables 218 and 219).

Extending the conclusions of chapter four concerning the poor cooperation and possibly inappropriate attitudes of terminating families regarding treatment, it was hypothesized that the attitude of parental intolerance of the enuretic child, as measured by the PIS, might be associated with termination. The data supported this hypothesis, the mothers of children withdrawn from treatment having a significantly higher median PIS score than the mothers of non-terminators (appendix E, table 220). The PIS score was not significantly associated with either the period of clinic attendance prior to termination, or the severity of enuresis at termination (appendix E, tables 221 and 222).

Discussion

The results reported above all rely upon three scales especially constructed for the purposes of the present research. The nature and limitations of these scales should therefore be considered prior to evaluation of the results obtained. The NV rating (see appendix C) yields a simple score of the number of suggested problems considered worse than enuresis, and may thus be regarded as a means of comparing the rank position allotted to enuresis in a given list by different mothers. While this is considered to be an acceptable measure of relative position on a dimension of perceived comparative severity of the disorder, no absolute significance can be assumed for such a rating completed for the staff of a clinic while the child is undergoing treatment. A strong response bias may be expected, and NV ratings must be regarded as relative scores within a
clinic population undergoing treatment.

The two attitude scales (CCS and PIS) were validated by judges' ratings of the positions of the various items along the dimensions to be measured (see appendices A and B). No validation against external criteria was practicable for these scales. While, therefore, the scales appear to the investigator and the judges to sample the attitudinal dimensions specified, it remains an assumption rather than a certainty that the PIS and CCS do in fact measure the respective attitudes of maternal intolerance and patient concern. It is also an assumption that these attitudinal dimensions exist as measurable continua in mothers and their enuretic children. Results obtained by the use of these scales in the specific clinical context, however, may be regarded as justified on the grounds of the present or absence of an empirical association between what is measured and background or outcome variables, the concepts of "parental intolerance" and "child concern" remaining the closest possible semantic approximations with which to label the factors measured. As with the NV rating, CCS and PIS scores must be regarded as relative within the context of a treatment situation.

The positive association between the age of a child and his child concern (CCS) score would be expected from the greater deviation from the norm that enuresis represents among older children, and the greater limitations it frequently imposes with increasing age. It would seem that enuresis, whether lifelong or of recent onset, presents a markedly greater cause for concern to the older child. The present data lend support to the practice of giving priority to the treatment of older children, although
the suggestion that progress in treatment may be facilitated by a presumably high level of motivation among highly concerned children is not supported.

It is of interest that no associations were discovered between the history (primary or secondary) or severity of enuresis and the measured attitudes of either child or mother. Concern at the fact of enuresis among enuretic patients, apparently increasing with age, seems to relate to the perception of being a bedwetter rather than to the duration of the disorder or the frequency of wetting - at least at the levels of accuracy of measurement obtained.

The findings pertaining to social class indicate that parental (maternal) attitudes may to some extent be socioeconomically determined, parental intolerance and consideration of enuresis as a greater nuisance occurring to a greater extent among the lower socioeconomic levels. It is probable that both class-determined attitudes towards children and the increased problems imposed by the enuretic child under less adequate housing conditions may contribute to this phenomenon, although these factors do not seem to be of relevance to the patient's level of concern.

Perhaps surprisingly, parental intolerance does not appear to be ameliorated by familiarity with the disorder; although it could equally be argued that early tolerance may be spent in families having a history of enuresis among their members. It is noteworthy that children are, as was expected, found to be more concerned at enuresis where a history of the same problem in other family members is absent; the isolated enuretic in an otherwise continent family may be especially concerned at the apparent
uniqueness of his problem.

The findings relating to anxiety factors indicate that although maternal WPS score does associate with slow therapeutic response (see chapter five), there does not appear to be any causal influence mediated by attitudinal factors as measured. That anxious children are apparently more highly concerned at being enuretic suggests anxiety (as measured by the CMAS) as a predisposing factor in the genesis of concern at the disorder. It is interesting, however, that since the correlation between CCS and maternal PIS score is non-significant, the hypothesis that the child's concern may occur as a response to parental intolerance (as each was measured) becomes untenable. The association between CMAS score and the mother's Nuisance Value rating may suggest that a mother regarding enuresis as a severe nuisance may tend to engender trait anxiety in her child, although it is probable that such an influence would become detectable in terms of increased CMAS score only after a considerable period, and would represent a specific sample of a more general parental attitude to the child rather than an isolated attitude to a specific disorder.

In relation to the problem of termination, the finding that the mother's PIS score is associated with termination may be construed as further support for the hypothesis (see chapter four) that terminating cases are those in which inappropriate familial attitudes prevail. Although PIS score is not associated with a family history of enuresis as is termination, and parental intolerance is therefore not the sole, nor possibly even the fundamental, dimension of the inappropriate attitudinal pattern
suggested in chapter four, intolerance of enuresis may be a further concomitant of an intolerance of therapeutic demands and a consequent predisposition to termination. The mother who is intolerant of her child's enuresis is likely to apportion "blame" for the child's wetting and perhaps to consider enuresis as a symptom of laziness and lack of effort; a mother holding such attitudes might be expected to be hostile to the orientation and heavy demands of a clinic attempting to treat a disorder which she may well suspect to be partially or wholly deliberate on the child's part. A high PIS score, obtainable at the first clinic appointment may, in the light of the present data, be regarded as an empirical predictor of subsequent termination.

Analysis has revealed the PIS rating to be of prognostic value in the context of therapy for enuresis, while the CCS associates solely with background factors and is thus of theoretical interest only. In the preparation of the two attitude scales however, it was apparent that the CCS was the less accurate instrument. The judges were in general less consistent in their ratings of the CCS items, as adults probably finding it easier to assess items relating to adult attitudes, and it was found necessary to accept less consistently rated items for inclusion in the CCS than was the case for the PIS (see appendices A and B). Furthermore, while the split-half reliability coefficient \(r_s\) for the PIS was 0.43, that for the CCS failed to reach a positive value. It was not practicable to calculate a test-retest reliability coefficient for either scale, since both attempted to assess attitude at a specific point of time in the course of clinic attendance. While the PIS may therefore be
regarded as a relatively accurate and potentially useful instrument, the sensitivity and reliability of the CCS are probably low and further use of this test is not recommended. It is possible that the CCS was insufficiently accurate or sensitive to elucidate certain associations that may nevertheless exist between child concern and the factors investigated, although some sensitivity is indicated by the positive associations that were found, and it seems the CCS has at least face-validity as a test of child concern.

In conclusion, it may be said that the present data are not consistent with the view that the attitudinal factors investigated are implicated in therapeutic response, but that attitudes held by the mother appear to be relevant to remaining in treatment and tolerating its demands.

Summary

The attitudes of maternal intolerance and patient concern regarding enuresis, and the "nuisance value" attached to enuresis by the mother, were assessed by means of specially constructed scales, and were investigated where appropriate in relation to background factors, speed of therapeutic response, and termination. Children's scores on the Child Concern Scale (CCS) were found to be higher amongst older children and those having no family history of enuresis. A positive correlation emerged between CCS and anxiety (CMAS) ratings. Mothers of anxious children (scoring highly on the CMAS) tended to regard enuresis as a greater nuisance. Mothers from the lower socioeconomic categories rated enuresis as a greater nuisance and yielded higher scores for intolerance (on the PIS). Attitudinal factors did not appear
relevant to slow or rapid response to treatment, but a high PIS score was found amongst terminating cases.
11. DISCUSSION AND CONCLUSIONS

In conducting the present research in the field setting of a special investigation clinic for the investigation and treatment of enuresis, it was decided to investigate problems occurring in the context in which therapy must be applied rather than in an experimental and highly-controlled laboratory situation. Results may thus be considered applicable in other clinical situations to an extent proportional to the similarity of such situations to the Vale Drive Clinic (described in chapter two). In selecting this strategy of research, it was recognised that the ability to select specific therapeutic procedures for experimental investigation in isolation from supportive and alternative procedures must be sacrificed for the important gain of practical relevance. With the exception of the study of over-learning reported in chapter six, the findings relate to the multiple therapeutic approach of a behaviour therapeutically oriented clinic rather than to the preferred treatment by enuresis alarm as a specific therapy; the clinic rather than any particular treatment has been selected as the appropriate unit for study of the practical problems encountered in clinical practice.

The present study reports the results of a large number of analyses, and in evaluating the significance of the findings the possibility of significant results occurring by chance must be borne in mind (Brozek and Tiede, 1952). It is equally possible that some results may have fallen short of the stipulated criterion of significance by chance, in the presence of a strong association. For this reason, it is considered advisable that the more important of the findings, both positive and negative, should be
replicated; preferably outside the clinic in which this study was conducted. This consideration applies particularly to the findings relating to overlearning, which carry important implications for clinical practice.

Consideration of associations reported in the present study between patient background factors and the variables investigated should be moderated by the fact that the research relates to a treated population of enuretics drawn from a specified geographical (local authority) area, and not to the total enuretic population in the community. It should for instance be borne in mind that Vale Drive patients are approximately normally distributed by social class around class III manual rather than sampling the commonly reported socioeconomic distribution of enuretics with a predominance among the lower socioeconomic levels (Blomfield and Douglas, 1956; Bakwin, 1961; Douglas and Blomfield, 1967; Stein and Susser, 1967; Meadow, 1970; Yates, 1970; Kolvin et al., 1971; Davie, Butler and Goldstein, 1972).

The decision to conduct the research in the treatment of childhood enuresis at a clinic accepting a learning theory orientation bears two implications for the evaluation of the findings. Firstly, enuresis represents a relatively well-defined and readily observable disorder of behaviour, which may be considered amenable to relatively standard therapeutic techniques derived from learning theory (Jones, 1960b; Young, 1965b; Turner, Young and Rachman, 1970; Yates, 1970; Morgan and Young, 1972; 1973). As such, the treatment of enuresis serves as a valuable testing-ground for the investigation of prognostic criteria and therapeutic problems which may serve to generate hypotheses.
applicable in other, perhaps somewhat less extensively developed, fields of behaviour therapy. Secondly, conditioning treatment would presently seem to constitute an economical and effective approach to the treatment of enuresis (see chapter one). Elaboration of its possible contraindications and study of its practical application in a situation where cases are not selected on the grounds of suitability or cooperation, and cannot in practice be exposed to an experimental purity of approach and control, are of the utmost importance in treating this particular disorder. In most therapies, for most disorders, a proportion of unsatisfactory outcomes is expected and may possibly be inevitable; it remains, however, all too easy to be satisfied with a relatively favourable "success" rate, frequently calculated solely from patients remaining in therapy. Such satisfaction is not justified, however, until the proportion of unsuccessful cases has been minimized to the greatest economical extent, and knowledge of the correlates and possible determinants of therapeutic failure is essential in redistributing existing or obtainable resources to this end.

The categories of therapeutic failure investigated in the present study may be conceived as successive losses from the total population of patients whose parents accept referral, as they progress towards the goal of relatively stable remission of enuresis. Conversely, successful treatment may be perceived as survival of the successive hurdles of the initial attendance at the clinic, tolerance of therapeutic demands to remain in therapy until discharged, satisfactorily rapid therapeutic response, and post-therapeutic maintenance of continent behaviour. The
findings of the present research may be incorporated into a "loss model" of therapeutic problems.

The first category of loss from the referred population comprises the "non-attending" patients (see chapters three and seven). Being more probably referred by health visitors, and less probably referred by general practitioners, these non-attenders may be conceived as a referral population fundamentally different from attending patients, and thus not sufficiently comparable with them to be acceptable in research as an untreated control group, as used in the study of child patients by Levitt et al. (1959). It is also possible that these non-attending patients, being less frequently wet than attenders at the date of the initial appointment given and spending longer on the waiting list for treatment, have made a response to the non-specific effects of awaiting treatment (De Leon and Mandell, 1966). However, the finding that only 9.7 per cent of children awaiting treatment had become dry to the satisfaction of the criterion adopted for the initial arrest of enuresis in treatment, coupled with the observation that only 19 children from a total of 70 non-attending patients studied in the concurrent phase of the research had become dry (see chapter seven), contra-indicates the assumption of pre-treatment remission as the major component of non-attendance. The major element underlying non-attendance would appear to emerge as low motivation for treatment, below a threshold for clinic attendance, among cases in which wetting may conceivably be of a low frequency at the time of referral, and in which little initiative was taken by the parents in seeking referral.

Low motivation occurring as a concomitant of referral source, if the above assumptions are acceptable, would seem to be screened
out by a prolonged waiting-list period, during which motivation may perhaps dissipate to some extent (see chapter three), to render referral source of no apparent relevance to the second stage of loss represented by termination (see chapter four). The hypothesized high perceived "cost" of treatment to the family, relative to the perceived "cost" of enuresis, may be an element in both non-attendance and termination, and if so would constitute the primary dimension culminating in early losses, from the referred population. It should be emphasized that inaccessibility of the clinic does not emerge as a major contributory factor in the perceived cost of treatment at this stage of loss (see chapter seven). The suggestion that the parents of terminating patients may regard enuresis as to some extent a deliberate act of laziness or defiance on the part of the child (see chapters seven and ten), and may regard treatment as a demanding and behaviourally costly procedure, is supported by the observation (see chapter four) of their greater fickleness in cooperating with therapy and their greater intolerance of enuresis, as indicated by PIS score (see chapter ten). In these cases, there appears to be little tolerance of problems encountered in therapy (see chapter four), and little optimism regarding the likely outcome of therapy, on the part of the child at least (as indicated by CE score - see chapter eight). Among terminating cases, enuresis occurs as a previously known element in family life (see chapter four), and although CCS score is not significantly associated with termination in itself, there is evidence (presented in chapter ten) that children are less concerned at being enuretic when it is a problem experienced by other family members.
At the termination stage of loss, a second major element emerges in addition to low motivation (or a low perceived differential between the behavioural cost of enuresis relative to its treatment). This second component, probably interactive with the first at the termination stage of loss, is that of poor therapeutic response. Terminators do not appear to progress well during their period of therapy (see chapter four), and only 19.1 per cent of terminators are withdrawn from treatment on becoming dry (apparent poor motivation however resulting in a further 11.2 per cent of children being withdrawn on their parents' satisfaction with only a reduction in wetting frequency—see chapter seven).

The factor of poor therapeutic response, which emerges as a possible determinant of loss through termination, naturally constitutes slow therapeutic response as it becomes more pronounced through the prolonged exposure to therapeutic effort. A common element in poor response applicable at both the terminator and slow responder stages of loss is the failure of a child to awaken to the auditory stimulus of an enuresis alarm (see chapters four and five); while for the terminator, this problem may be conducive to a concomitant poor cooperation with treatment, this element is absent from the group of slow responders, whose cooperation appears as satisfactory as that of rapid responders (see chapter five). Paradoxically, it is the mother's score for anxiety on the Willoughby Personality Schedule (Willoughby, 1932) rather than the child's score on the Children's Manifest Anxiety Scale (Castaneda, McCandless and Palermo, 1956) that appears to be prognostic of slow therapeutic response. While it is possible that mothers having high indicated levels of
anxiety may lack the competence in performing their major and demanding therapeutic role that may be necessary to secure a rapid response, the precise role of anxiety, as measured, in the treatment situation remains uncertain. The present findings do not support the application of the Yerkes-Dodson model (Yerkes and Dodson, 1908; Dodson, 1915; Eysenck, 1960b) to the treatment of childhood enuresis (see chapter one); present evidence, however, does not permit dogma over the application of aetiological or therapeutic models, and it remains a strong possibility that the concept of multiple causation may be applicable to enuresis, and that the processes of treatment may vary in detail or in nature from one case to another.

A new factor which enters into the picture of therapeutic shortcomings at the slow response stage is that of familial disruption. While the fact of family disruption as defined (see chapter five) associates with slow therapeutic response, there is no evidence that any effect is mediated by attitudinal or expectancy factors (see chapters eight and ten). High maternal anxiety and a history of familial disruption, however, appear to create a context antipathetic to successful treatment, and may be utilized as indicators that particular attention to problems of non-awakening to alarm stimuli should be paid to such patients. Such a course of action utilizes the finding that the problem of non-awakening is significantly associated with slow therapeutic response.

The final stage of loss to the course of acceptably successful treatment is constituted by the phenomenon of relapse. The findings of chapter six indicate that relapse is not predictable
by means of patient or background variables, but may be a shortcoming arising directly from the specific processes of treatment. The indicated strategy for countering relapse is thus not an attempted selection of cases at risk of relapse for specific countermeasures, but the routine incorporation of a countermeasure in therapy. Intermittent reinforcement, although derived from experimental analogy, has not been successfully applied to counter relapse (Lovibond, 1963; 1964; Turner, Young and Rachman, 1970) - although it is quite probable that parents overestimate their fidelity in following prescribed therapeutic procedures when speaking to therapists, intermittent use of an alarm perhaps occurring in many cases for which it is not specifically prescribed. The overlearning procedure described in chapter six did however associate significantly with a reduction of the relapse rate to approximately 12 per cent. The two studies presently published in the literature relating to overlearning (Young and Morgan, 1972; 1972d) were both conducted at the Vale Drive clinic, and replication elsewhere is essential.

Considering the results of the present study concerning expectancy factors (see chapter eight), the finding that a low patient prognostic expectancy (CE score) is apparently prognostic of termination supports the suggestion by Goldstein (1962) that expectancies may be implicated in the termination of treatment. Apart from this single finding, however, expectancies have not in the present study emerged as factors relevant to outcome. Hallgren's (1957) hypothesis that the parents of enuretic boys might prove more intolerant of the problem than those of enuretic girls is not substantiated by the use of the PIS in the present study.
Regarding the findings of the present research concerning social class, the absence of a social class bias in termination (see chapter four) supports the findings of Tuckman and Lavell (1959) and Ross and Lacey (1961) that a socioeconomic bias was absent in the withdrawal of child patients from psychiatric treatment. Social class is found to be associated with parental (maternal) attitudes (see chapter 10), high intolerance (PIS) and perception of enuresis as a greater nuisance being characteristic of the lower socioeconomic levels. The implications of this association for treatment are however minimal since social class is not found to be associated directly with slow response, termination or relapse, and thus does not emerge as a prognostic factor. Consideration of the associations between social class and parental attitude must therefore be limited to the theoretical discussion presented in chapter 10.

Parental cooperation and family background have been indicated as central elements in treatment, antipathetic or intolerant parental attitudes emerging as vital correlates of certain categories of therapeutic failure. The mother is an essential agent of therapeutic procedures frequently conducted in the home over prolonged periods, and appropriate training and support in the procedures involved should be regarded as central to the efficacy of therapy. Further research is indicated into the practicalities of treatment approaches centring upon the use of the enuresis alarm in various contexts, such as the overcrowded home and in residential child care (Morgan and Young, 1973), where houseparents may become highly accommodated to the common occurrence of enuresis.
Much of the value of the present study lies in its suggestion that many common prognostic assumptions may be invalid. Diurnal problems of micturition, suggested as prognostic factors by Lovibond (1964), are for instance not found to be associated with the outcome of treatment, and the report that secondary enuretics carry a less favourable prognosis (Seiger, 1952; Kolvin et al., 1971) is not supported. The more satisfactory prognosis reported for younger children and more frequent wetters (Gillison and Skinner, 1958; Wickes, 1958) is similarly not substantiated. With regard to relapse, the post-treatment recurrence of enuresis is not found to be higher amongst children presenting diurnal disturbances of micturition, as reported by Coote (1970), nor among extraverted children as found by Young (1965c).

While it would be inappropriate to attempt to predict the future occurrence of therapeutic problems in individual cases, the findings of the present research do indicate certain criteria, on the basis of which it may prove practicable to delineate categories of enuretic patients carrying a predisposition towards specific problems in therapeutic situations similar to the Vale Drive clinic. Referral source may be taken to predict possible non-attendance, health visitor referral being prognostic of a greater, and general practitioner referral of a lesser, probability of non-attendance. Factors prognostic of slow treatment response would appear to be high maternal WPS score and a history of familial disruption, both factors discernible on entry to treatment.

Termination is a major therapeutic problem on which little previous research has been conducted in the field of enuresis, and
is fortunately a problem for which three prognostic factors emerge. A positive family history of enuresis, a low patient prognostic expectancy (CE) score, and a high parental intolerance (PIS) score all emerge as predictors of termination. Since these three factors are not found to be interrelated, they may in combination provide a more powerful and reliable predictor of termination than would each used in isolation. All three factors are amenable to brief and simple determination prior to the initiation of treatment.

In cases identified as being at risk of termination, the observed poor cooperation with treatment indicates the probable value of increased emphasis upon support and effective parent training in any specific techniques to be prescribed, coupled with a more intense supervision of the conduct of treatment and a particularly rapid attention to therapeutic problems, of which there may exist a low level of tolerance. Bearing in mind the possibility that the "costliness" of therapy may be perceived as particularly high, the probable demands of any technique applied should be carefully considered as an important factor in planning a treatment strategy.

Although it is possible that poor cooperation is of greater importance among terminators, the factor of failure to awaken to an alarm when used probably contributes to both termination and slow response, being significantly associated with both. It is a common problem which merits research. The problem of non-awakening tends to be prolonged in many cases, and is often not relieved by the substitution of different alarms (see chapter five). Conditioning treatment of enuresis relies heavily upon
the capacity of an external stimulus to elicit a response from the child, yet the alarm stimulus is applied at a stage in sleep at which the child is particularly non-responsive to external stimuli (Broughton, 1968). The findings of the present study, in underlining the implications for successful therapy of stimulus effectiveness, emphasise the urgent need for an effective means, or range of means, for circumventing the problem of the non-awakening patient. The use of amphetamines to lighten sleep (Strom-Olsen, 1950; Bostock and Eckert, 1957; Bostock, 1962) is questionable, since although CNS stimulant drugs may facilitate the conditioning process, particularly in extraverts (Young and Turner, 1965), their effect appears to be at the expense of an inflated relapse rate (Turner and Young, 1966).

Three approaches to the solution of the non-awakening problem appear feasible; (1) the use of non-auditory stimuli, (2) the use of techniques to sensitise the child to the waking stimulus employed, and (3) improvement in the efficacy of the auditory stimuli employed. Crosby (1950) has made use of electrical stimuli, but their widespread use cannot be supported on the grounds of any superior therapeutic effect (Lovibond, 1964), and the application of shocks to children is not desirable. Browning (1967) has reported, in a single case study, the possible beneficial effect upon awakening of operant reinforcement of rapid response to the sound of an alarm, and this technique, with others designed to sensitise the child to the stimulus, deserves further investigation. It is probable that the problem of non-awakening may be minimized by the availability to the therapist of a range of stimuli, including perhaps both auditory and
optical stimuli. A preliminary study comparing three common alarm types in use at the Vale Drive clinic has unfortunately found no significant differences between the types regarding outcome, either in terms of treatment efficiency or of subsequent relapse (Young and Morgan, 1932a).

In conclusion, the present research has been concerned with the context of treatment as a whole, as a situation comprising the interdependent elements of the child patient, the family (typically represented at the clinic by the mother) and the therapeutic team. Specific treatment processes are only considered in the context of their application, the problems arising being investigated at a practical level. The successive stages of therapeutic loss, representing both the loss of patients to therapy and the loss of therapeutic investment in poorly responding cases, are productive of uneconomic therapy, frustration and disappointment for parents, and prolonged wetting for the children. It is hoped that the present findings regarding the correlates and potential predictors of defined problems, and regarding the attitudinal and other elements of the treatment situation, will afford a foundation for future research relating to both possible countermeasures to therapeutic shortcomings and the relevance of elements in the context of therapy.
APPENDIX A

THE CHILD CONCERN SCALE (CCS)

The Child Concern Scale is a 20-item attitude scale designed, for the purposes of the present study, to afford an assessment of the enuretic child's degree of concern at being enuretic. The items used were selected as those most consistently rated by judges as indicative of a certain level of concern. Items considered by the investigator to bear face validity to the variable of "child concern" were thus quantified by the collective ratings of judges.

Rating by Judges

A list of 50 items was duplicated and distributed to 40 judges, who were qualified or student social workers contacted through the University of Leicester School of Social Work. The judges were instructed to rate, on a five-point scale, the level of concern they considered to be indicated by a child's agreement with each item. The following instructions were attached:

"Below is a list of 50 statements concerning the child's feelings about bedwetting. Please read the first statement carefully, and decide which of the given degrees of concern about the symptom you think is being expressed by a child who agrees that the statement is true about himself. Put a tick in the appropriate column opposite the statement. Continue to rate each statement in the list in the same fashion."

The five columns opposite the statements were headed; "extremely concerned," "very concerned," "concerned," "slightly concerned" and "unconcerned." These categories were arbitrarily
assigned the ordinal scores of 4, 3, 2, 1 and 0 respectively, the rank score of zero being a matter of convenience alone and in no way indicative of ratio scaling, merely indicating that the lowest point on the scale was represented to the validating judges as an absence of concern. It was intended that each judge should rate each original item according to an ordinal measure of the presumably continuous variable of "child concern."

Following receipt of the judges' ratings, a cumulative frequency table was constructed of the ratings given to each item, and plotted graphically. The median rating, to two decimal places, was read from the ogive for each item, and constituted the scale value for that item. The interquartile range for each item was taken as a measure of the consistency of judges' ratings for that item. The 20 items which, in randomly chosen order, constitute the final attitude scale are those most consistently rated (i.e., having the lowest interquartile ranges) which appeared to afford a reasonable coverage of the total range of scale values. Any item yielding an unsatisfactorily irregular ogive on the cumulative frequency graph was rejected as containing a possible ambiguity.

Through the validation process described above, the scale value of each item of the final scale affords a rating of the level of child concern which may be ascribed to a testee responding to it in the affirmative. In effect, this rating quantifies at an ordinal level of measurement the consensus of opinion of 40 independent judges.

The Final Scale

The final version of the scale consisted of items having a scale value range of 0 to 2.75, the maximum acceptable interquartile
range of judges' ratings being 1.10 scale points. The median scale value of the final scale was 1.58.

The scale items were printed in random order on the final scale, which is reproduced below. The scale value of each item, not included on the scale itself, is added below in brackets.

CHILDREN'S SCALE (C.C.S.)

Name ..........................................................

Here we have written down some of the things that children often feel about wetting the bed. Read each one carefully. Put a circle round the word YES if you think it is true about you. Put a circle round the word NO if you think it is not true about you.

1. I am frightened of people finding out about me wetting the bed (2.75) YES NO
2. I think it is cruel to make jokes about wetting the bed (2.15) YES NO
3. I get told off when I wet the bed (1.15) YES NO
4. I think people make too much fuss about a few wet sheets (0.00) YES NO
5. I hate waking up to find my bed wet (1.80) YES NO
6. My wet sheets make a lot of work for other people (1.20) YES NO
7. I get terribly upset when my bed is wet (2.60) YES NO
8. I try to keep it a secret that I wet my bed (2.45) YES NO
9. I would like to be dry because it would please other people (1.45) YES NO
10. I am always sorry when I wet the bed (1.35) YES NO
11. Some people don't like me because I wet the bed (2.05) YES NO
12. I am always pleased when my bed is dry (1.70) YES NO
13. No-one gets cross with me for wetting my bed (0.25) YES NO
14. Wet beds are cold and uncomfortable, which I don't like (1.25) YES NO
15. I am worrying about being wet tonight (2.35) YES NO

16. By the afternoon, I have usually forgotten whether I was wet or dry the night before (0.30) YES NO

17. I'm afraid people might get cross with me if I'm not dry soon (1.90) YES NO

18. I would like to be dry (1.30) YES NO

19. My friends sometimes laugh at me for wetting the bed (2.15) YES NO

20. I expect I will be dry when I am older (0.15) YES NO

The above scale was presented to every child included in the concurrent phase of the study. Where possible, the scale was self-administered, but in the majority of cases the investigator found it necessary to present the scale orally. Where a child found difficulty in giving a positive or negative response to any item, the item was presented as a statement made by another child, and the patient asked "is that right or wrong about you?" A child's score on the CCS is the median of the scale values of all items evoking an affirmative response.

Normative Data

The CCS was administered to all members of the concurrent series of the present study, 120 children making a satisfactory response. The resultant scores ranged from 0.80 to 1.75, with a semi-interquartile range of 0.113. The first and third quartiles fell at 1.35 and 1.575 respectively, the median and modal score being 1.40. A histogram of the scores obtained on the CCS is presented in Fig. one.

- 217 -
Figure 1.
Histogram of CCS scores.
APPENDIX B

THE PARENT INTOLERANCE SCALE (PIS)

The Parent Intolerance Scale is a 20-item attitude scale designed, for the purposes of the present study, to afford an assessment of parental attitude on the dimension of tolerance/intolerance of enuresis. The scale was designed for completion by mothers only. The split-half reliability coefficient ($r_s$) of the PIS, for the 134 mothers of the concurrent series who were able to complete the scale satisfactorily, is 0.43. It had been ascertained prior to calculating the split-half reliability coefficient that the half-scale median scores did not differ significantly (using the Mann-Whitney "U" test, $U = 32.0$).

The 20 items constituting the final scale were selected from an original list distributed to the 40 independent judges in the same manner as described in appendix A in respect of the child concern scale. The list distributed to the judges for rating consisted of 40 original items, fewer than in the case of the CCS since the task of rating items for presentation to adults was regarded as simpler than that of rating items in relation to a child attitude; it was indeed found that the judges ratings were more consistent for PIS items than for CCS items. The following instructions for judges preceded the original item list:

"Please read the first statement below, and decide which of the attitudes opposite you consider would best describe that held by a parent who agrees with the statement.

Put a tick in the appropriate column.

Please note; you are not being asked what your own attitude would be towards an enuretic child, nor what you think a parent's attitude should be, but to judge as objectively as you can, the attitude a parent is expressing..."
by agreement with a given statement. You are identifying the attitude behind the statement, not making your own response to the statement.

The five columns opposite the statements were headed; "extreme intolerance of the child's bedwetting," "intolerance of the child's bedwetting," "a neutral attitude towards the child's bedwetting," "tolerance regarding the child's bedwetting" and "extreme tolerance regarding the child's bedwetting". These categories were arbitrarily assigned the ranks 1, 2, 3, 4 and 5 respectively, the PIS thus affording a quantification (derived from a consensus of judges' ratings) at an ordinal level of measurement of a mother's position on a tolerance/intolerance attitudinal dimension, low scorers falling towards the tolerant end of the continuum.

The Final Scale

The final version of the PIS consisted of items ranging in scale value from 1.10 to 4.25; a scale value of 3.0 represented a neutral rating of tolerance/intolerance by the judges. The median scale value of the items constituting the final scale was 2.83. The judges' ratings of PIS items proved to be more consistent, as predicted, than their ratings of CCS items; the maximum acceptable interquartile range of ratings for inclusion in the final scale being 0.85 scale points.

The items were printed in random order to constitute the final scale, which is reproduced below. The scale value of each item, not included on the scale itself, is added below in brackets.
**PARENT'S SCALE (P.I.S.)**

Name of child ..............................................................

Below is a list of statements about bedwetting. Please read each one carefully. Put a circle round the word YES if you think it describes your own feelings. Put a circle round the word NO if you think it does not describe your feelings.

1. A child who wets the bed needs help and sympathy (1.15) YES NO

2. If only he (she) would grow up a bit we wouldn't have all this trouble with wet beds (3.55) YES NO

3. Bedwetting is not really much of a problem (2.25) YES NO

4. Children could stop wetting if they tried hard enough (3.90) YES NO

5. I have got used to wet beds by now (2.55) YES NO

6. I punish my child for wetting the bed (4.15) YES NO

7. Bedwetting usually clears up on its own (2.10) YES NO

8. My child's bedwetting is a nuisance to the rest of us (3.45) YES NO

9. I let him (her) see that I am disappointed when he (she) has wet the bed (3.40) YES NO

10. Bedwetting is nothing but a dirty habit (4.25) YES NO

11. When my child wets the bed I tell him (her) that it does not matter (1.25) YES NO

12. I worry more about my child's happiness than about a few extra sheets to wash (1.10) YES NO

13. I try to help him (her) not to be upset by his (her) bedwetting (1.25) YES NO

14. It is a pity that bedwetting stops a child from doing so many things (2.30) YES NO

15. I feel sorry for any child who wets the bed (1.45) YES NO

16. A good smacking never did any bedwetter any harm and may do a lot of good (4.0) YES NO

17. I do not mind washing wet sheets because the child can't help it (1.30) YES NO
18. I don't see why my child can't be dry when others can (3.50)   YES  NO

19. I try to make my child realise the unpleasantness his (her) bedwetting causes for others (3.60)   YES  NO

20. It is very embarrassing to be a bedwetter (3.10)   YES  NO

Where possible, the above scale was self-administered, although the investigator found it necessary to present the scale orally to mothers unable to read or with a poor command of written English. Where a mother found difficulty in responding in the requested manner, she was asked to imagine her reactions should each of the items occur in the course of a conversation on the subject of enuresis. A mother's score on the PIS is the median of the scale values of all items evoking an affirmative response.

Normative Data

The PIS was administered to the mothers of all patients included in the concurrent series of the present study. A satisfactory rating was obtained in 134 cases. The resultant scores ranged from 1.25 to 3.425, with a semi-interquartile range of 0.438. The first and third quartiles fell at 1.375 and 2.25 respectively, the median and modal score being 1.45. A histogram of the scores obtained on the PIS is presented in Fig. one.
Figure 1. Histogram of PIS scores.
APPENDIX C

THE NUISANCE-VALUE RATING (NV)

The "nuisance value" attached to enuresis by the mothers of patients in the concurrent series of the present study was assessed by the number of problems from a duplicated list of 25 which they regarded as "worse to deal with" than enuresis. The following instructions preceded the list of problems:

"Below is a list of problems one often finds among children. Please tick all those which you think are worse to deal with than bedwetting is; whether or not you have actually come across them yourself."

In some cases it proved necessary to emphasize the instruction that every item should be considered, whether or not the problem had actually been encountered. It was assumed that a greater number of problems ticked indicated a lower nuisance value attaching to enuresis. The 25 problems listed are reproduced below in the order of their frequency of selection by respondents:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>stealing</td>
<td>100</td>
</tr>
<tr>
<td>often spiteful and cruel</td>
<td>92</td>
</tr>
<tr>
<td>running away</td>
<td>91</td>
</tr>
<tr>
<td>lying</td>
<td>87</td>
</tr>
<tr>
<td>deliberately breaks things</td>
<td>86</td>
</tr>
<tr>
<td>always crying and miserable</td>
<td>79</td>
</tr>
<tr>
<td>playing truant from school</td>
<td>77</td>
</tr>
<tr>
<td>soils pants</td>
<td>72</td>
</tr>
<tr>
<td>bullies smaller or younger children</td>
<td>71</td>
</tr>
<tr>
<td>disobedience</td>
<td>70</td>
</tr>
<tr>
<td>has nightmares</td>
<td>69</td>
</tr>
<tr>
<td>sleepwalking</td>
<td>66</td>
</tr>
<tr>
<td>always fighting</td>
<td>62</td>
</tr>
<tr>
<td>often sick</td>
<td>61</td>
</tr>
</tbody>
</table>
temper tantrums  
jealous of others  
sulkiness  
sensitive and easily upset  
( afraid of the dark )  
( always seems to have aches and pains )  
( moodiness )  
wets pants  
noisy and restless  
needs a lot of attention  
fussiness  

The NV rating list was completed by 108 mothers of patients in the concurrent series. For practical reasons, it was necessary to permit the NV scale to be completed at home (see chapter ten), and some forms were not returned to the clinic. The median number of problems regarded as "worse to deal with" than enuresis was 13.

The distribution of NV ratings is presented in Fig. one.
Figure 1. Histogram of NV ratings.
APPENDIX D

THE EXPECTANCY RATINGS

Four simple five-alternative multiple-choice questions were used to assess, for both mothers and children, the pre-treatment expectancy of therapeutic outcome and the post-treatment expectancy of relapse.

The questions and instructions, presented in written form wherever possible, are reproduced below.

Parent expectancy of therapeutic outcome (PE):

"We would like you to help us with our research into how successful both parents and children at this clinic think treatment will be. Please tick the statement below that you most agree with as far as this particular child is concerned."

I feel certain that treatment will succeed
I think treatment will probably succeed
I have no opinion about it
I think treatment will probably fail
I feel certain that treatment will fail

Thank you."

Child expectancy of therapeutic outcome (CE):

"We have written down some of the things that children sometimes think about the way this clinic helps you to become dry. Read them all first, and put a tick next to the one that is most like what you think."

I am sure it will make me dry
It might make me dry
I don't know if it will make any difference
It might not make me dry
I am sure it won't make me dry"
Parent expectancy of relapse (PRE):

"We are trying to find out what parents think about children cured at this clinic. Please tick the statement below that you most agree with as far as this particular child is concerned."

I feel certain that he/she will never wet again
I think it is unlikely that he/she will wet again
I have no opinion about it
I think it is likely that he/she will wet again
I feel certain that he/she will wet again

Thank you.

Child expectancy of relapse (CRE):

"Now that you are dry, we would be interested to know how you feel about it. Read what we have written, and put a tick next to the one that is most like what you think."

I am sure I will never wet my bed again
I don't think I will wet my bed again
I don't know whether I will wet my bed again
I think I might wet my bed again
I am sure I will wet my bed again.

Responses to the above questions were not regarded as in any way an indicator of expectancy in absolute terms, but were considered to hold a relative value, agreement with a statement conveying greater certainty of a positive outcome or of relapse indicating a higher expectancy than agreement with a statement expressing less certainty. It is likely that expectancies expressed to the investigator, as a member of the clinic team, should be somewhat inflated in favourability to the clinic.

Where children appeared unable to select one response from five alternatives for the CE or CRE, the alternatives were reduced by the investigator to three, indicating positive,
neutral and negative expectancy. If the child selected the positive or negative alternative, he was then asked to choose between the two original positive or negative items.

The PE and CE responses were scored on an arbitrary five-point scale, the score of five being allocated to the first statement in each case (indicating high expectancy for positive treatment outcome). Responses to the PRE and CRE questions were scored on a similar scale, the score of five (high expectancy of relapse) being allocated to the fifth statement in each case.

The numbers of cases in the concurrent phase for whom expectancy ratings are available are as follows;

<table>
<thead>
<tr>
<th></th>
<th>PE</th>
<th>CE</th>
<th>PRE</th>
<th>CRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>139</td>
<td>129</td>
<td>124</td>
<td>144</td>
</tr>
</tbody>
</table>

Table one presents the numbers of respondents selecting each alternative for the four scales.

<table>
<thead>
<tr>
<th>Score</th>
<th>PE</th>
<th>CE</th>
<th>PRE</th>
<th>CRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>9</td>
<td>34</td>
<td>65</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>67</td>
<td>38</td>
</tr>
<tr>
<td>3</td>
<td>22</td>
<td>23</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>78</td>
<td>40</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>37</td>
<td>55</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

| Total | 139 | 129 | 124 | 144 |

Table one: Expectancy Ratings (figures represent number of respondents).

It may be noted that children appear to be somewhat more optimistic than their mothers, in terms of both high expectancy
of success in treatment and low expectancy of relapse following initial cure. Little importance, however, can be attached to this observation, because of the lack of comparability between the wordings of two separate multiple-choice questions.
APPENDIX E

SUMMARY OF DATA

Non-attenders: median age, 6.67 years (mean 7.37 years)
Attenders: median age, 6.67 years (mean 7.48 years)
Mann-Whitney "U" = 3230.5, z = .22, p = .83

Table 1: Age and non-attendance

<table>
<thead>
<tr>
<th></th>
<th>Non-attenders</th>
<th>Attenders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>20</td>
<td>114</td>
</tr>
<tr>
<td>Girls</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>174</td>
</tr>
</tbody>
</table>

$\chi^2 = 1.71, \ df = 1, \ p > .10$

Table 2: Sex and non-attendance

<table>
<thead>
<tr>
<th></th>
<th>Non-attenders</th>
<th>Attenders</th>
</tr>
</thead>
<tbody>
<tr>
<td>School medical officer</td>
<td>27</td>
<td>100</td>
</tr>
<tr>
<td>Self-referral</td>
<td>3</td>
<td>32</td>
</tr>
<tr>
<td>General practitioner</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Health visitor</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>171</td>
</tr>
</tbody>
</table>

$\chi^2 = 14.67, \ df = 3, \ p < .01$ (significant)

Table 3: Referral source and non-attendance

<table>
<thead>
<tr>
<th></th>
<th>Non-attenders</th>
<th>Attenders</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP referral</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Other referral</td>
<td>37</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>174</td>
</tr>
</tbody>
</table>

$\chi^2 = 4.23, \ df = 1, \ p < .05$ (significant)

Table 4: GP referral and non-attendance

<table>
<thead>
<tr>
<th></th>
<th>Non-attenders</th>
<th>Attenders</th>
</tr>
</thead>
<tbody>
<tr>
<td>HV referral</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Other referral</td>
<td>31</td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>174</td>
</tr>
</tbody>
</table>

$\chi^2 = 6.06, \ df = 1, \ p < .02$ (significant)

Table 5: HV referral and non-attendance
### Table 6: SMO referral and non-attendance

<table>
<thead>
<tr>
<th></th>
<th>Non-attenders</th>
<th>Attenders</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMO referral</td>
<td>27</td>
<td>100</td>
</tr>
<tr>
<td>Other referral</td>
<td>11</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>174</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 1.86, \text{ df } = 1, \ p > .10 \]

### Table 7: Self-referral and non-attendance

<table>
<thead>
<tr>
<th></th>
<th>Non-attenders</th>
<th>Attenders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-referral</td>
<td>3</td>
<td>32</td>
</tr>
<tr>
<td>Other referral</td>
<td>35</td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>174</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 1.79, \text{ df } = 1, \ p > .10 \]

### Table 8: Distance from the clinic and non-attendance

Non-attenders: median distance, 3.5 miles; range, under 0.5 miles to 10.0 miles (mean 3.26 miles)

Attenders: median distance, 2.5 miles; range, under 0.5 miles to 7.5 miles (mean 2.85 miles)

Mann-Whitney "U" = 2873.5, \( z = 1.27, \ p = .20 \)

### Table 9: Waiting period and non-attendance

Non-attenders: median waiting period, 17.0 weeks; range 9 weeks to 22 weeks (mean 17.13 weeks)

Attenders: median waiting period, 13.54 weeks; range 0 weeks to 37 weeks (mean 13.99 weeks)

Mann-Whitney "U" = 2009.0, \( z = 3.77, \ p = .00022 \) (significant)

### Table 10: Type of treatment and termination

<table>
<thead>
<tr>
<th></th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enuresis alarm</td>
<td>43</td>
<td>101</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>108</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 1.55, \text{ df } = 1, \ p > .20 \]

### Table 11: Sex and termination

<table>
<thead>
<tr>
<th></th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>34</td>
<td>72</td>
</tr>
<tr>
<td>Girls</td>
<td>16</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>108</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.00026, \text{ df } = 1, \ p > .98 \]
Terminators: median age, 6 years; range 4 to 13 years (mean 6.92 years)
Non-terminators: median age, 7 years; range 4 to 15 years (mean 7.67 years)
Mann-Whitney "U": 24050, z = 1.12, p = .26

Table 12: Age and termination

<table>
<thead>
<tr>
<th></th>
<th>Terminators</th>
<th></th>
<th>Non-terminators</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
<td>15</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>11</td>
<td>25</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>20</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>17</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>11</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>6</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>6+</td>
<td>5</td>
<td>13</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>107</td>
<td>157</td>
<td></td>
</tr>
</tbody>
</table>

\[ \chi^2 = 5.21, \text{ df } = 6, p > .50 \]

Table 13: Number of somatic symptoms and termination

<table>
<thead>
<tr>
<th></th>
<th>Terminators</th>
<th></th>
<th>Non-terminators</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>11</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>13</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>18</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>21</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>13</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>6+</td>
<td>10</td>
<td>21</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>107</td>
<td>157</td>
<td></td>
</tr>
</tbody>
</table>

\[ \chi^2 = 5.44, \text{ df } = 6, p > .30 \]

Table 14: Number of psychologic symptoms and termination

<table>
<thead>
<tr>
<th></th>
<th>Terminators</th>
<th></th>
<th>Non-terminators</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Previously treated</td>
<td>18</td>
<td>43</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td>Not previously treated</td>
<td>32</td>
<td>64</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>107</td>
<td>157</td>
<td></td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.11, \text{ df } = 1, p > .70 \]

Table 15: Previous treatment experience and termination

<table>
<thead>
<tr>
<th></th>
<th>Terminators</th>
<th></th>
<th>Non-terminators</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>44</td>
<td>93</td>
<td>137</td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>6</td>
<td>14</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>107</td>
<td>157</td>
<td></td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.0045, \text{ df } = 1, p > .90 \]

Table 16: Types of enuresis and termination
Terminators | Non-terminators
---|---
Regular | 12 | 39 | 51
Irregular | 38 | 68 | 106
50 | 107 | 157

\[ \chi^2 = 1.87, df = 1, p > 0.10 \]

**Table 17: Irregularity of enuresis and termination**

<table>
<thead>
<tr>
<th>Wet nights per week</th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
</table>
| 2 or less | 4 | 15 | 19
| 3 | 3 | 5 | 8
| 4 | 4 | 14 | 18
| 5 | 6 | 19 | 25
| 6 | 9 | 14 | 23
| 7 | 24 | 40 | 64
| 50 | 107 | 157

\[ \chi^2 = 4.13, df = 5, p > 0.50 \]

**Table 18: Severity of enuresis and termination**

<table>
<thead>
<tr>
<th>History of awakening</th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
</table>
| No history of awakening | 43 | 81 | 124
| 50 | 107 | 157

\[ \chi^2 = 1.60, df = 1, p > 0.20 \]

**Table 19: Spontaneous awakening and termination**

<table>
<thead>
<tr>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
</table>
| Improved | 6 | 21 | 27
| 44 | 86 | 130
| 50 | 107 | 157

\[ \chi^2 = 0.91, df = 1, p > 0.30 \]

**Table 20: Waiting-list improvement and termination**

<table>
<thead>
<tr>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
</table>
| Urgency of micturition | 17 | 29 | 46
| Frequency of micturition | 17 | 25 | 42
| Diurnal enuresis | 7 | 9 | 16
| Encopresis | 6 | 4 | 10
| 47 | 67 | 114

\[ \chi^2 = 1.86, df = 3, p > 0.50 \]

**Table 21: Additional eliminative disorders and termination**

- 231 -
<table>
<thead>
<tr>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>3 or 4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

\(\chi^2 = 5.50, \text{ df } = 3, p > .10\)

Table 22: Number of additional eliminative disorders and termination

<table>
<thead>
<tr>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive family history</td>
<td>35</td>
</tr>
<tr>
<td>No family history</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>49</td>
</tr>
</tbody>
</table>

\(\chi^2 = 4.98, \text{ df } = 1, p < .05\) (significant)

Table 23: Family history and termination

<table>
<thead>
<tr>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive maternal history</td>
<td>10</td>
</tr>
<tr>
<td>No maternal history</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>49</td>
</tr>
</tbody>
</table>

\(\chi^2 = 0.0072, \text{ df } = 1, p > .90\)

Table 24: Maternal history of enuresis and termination

<table>
<thead>
<tr>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive paternal history</td>
<td>6</td>
</tr>
<tr>
<td>No paternal history</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>49</td>
</tr>
</tbody>
</table>

\(\chi^2 = 0.0041, \text{ df } = 1, p > .90\)

Table 25: Paternal history of enuresis and termination

<table>
<thead>
<tr>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive history</td>
<td>25</td>
</tr>
<tr>
<td>No history</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>49</td>
</tr>
</tbody>
</table>

\(\chi^2 = 3.29, \text{ df } = 1, p > .05\)

Table 26: History of enuresis in a sibling and termination

<table>
<thead>
<tr>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>3 or more</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>49</td>
</tr>
</tbody>
</table>

\(\chi^2 = 6.62, \text{ df } = 3, p > .05\)

Table 27: Number in family presenting a history of enuresis and termination
### Table 28: Social class and termination

<table>
<thead>
<tr>
<th>Social class</th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>II</td>
<td>8</td>
<td>35</td>
</tr>
<tr>
<td>III-N</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>III-M</td>
<td>26</td>
<td>35</td>
</tr>
<tr>
<td>IV &amp; V</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>101</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 8.06, \text{ df} = 4, p > .05 \]

### Table 29: Mother's employment and termination

<table>
<thead>
<tr>
<th></th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not employed</td>
<td>29</td>
<td>65</td>
</tr>
<tr>
<td>Employed part-time</td>
<td>15</td>
<td>35</td>
</tr>
<tr>
<td>Employed full-time</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.09, \text{ df} = 2, p > .50 \]

### Table 30: Mother's age and termination

Terminators: median age, 31; range 26 to 56 (mean, 33.5 years)
Non-terminators: median age, 35; range 24 to 56 (mean, 35.6 years)

Mann-Whitney "U" = 1316.5, z = 1.82, p = .069

### Table 31: Family size and termination

<table>
<thead>
<tr>
<th>No. of children</th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
<td>38</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>5+</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>108</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 6.42, \text{ df} = 4, p > .10 \]

### Table 32: Family position and termination

<table>
<thead>
<tr>
<th>Rank position among sibs.</th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st (or only)</td>
<td>9</td>
<td>35</td>
</tr>
<tr>
<td>2nd</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>3rd</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>4th</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>5th or above</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>108</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 3.74, \text{ df} = 4, p > .30 \]
Terminators  Non-terminators

Youngest children  23  37  60
Eldest children  7  21  28
30  58  88

(NB: one-child families and twins excluded)

\[ \chi^2 = 0.98, df = 1, p > 0.30 \]

Table 33: Youngest and eldest children and termination

Terminators  Non-terminators

Adverse familial circumstances  9  10  19
Other cases  41  97  138
50  107  157

\[ \chi^2 = 1.65, df = 1, p > 0.10 \]

Table 34: Adverse familial circumstances and termination

Terminators  Non-terminators

History of separation  9  7  16
No history of separation  41  100  141
50  107  157

\[ \chi^2 = 3.72, df = 1, p > 0.05 \]

Table 35: History of separation and termination

Terminators: median distance, 2.75 miles; range, under 0.5 miles to 6.0 miles (mean 2.8 miles)
Non-terminators: median distance, 2.75 miles; range, under 0.5 miles to 7.5 miles (mean 2.87 miles)
Mann-Whitney \( U \) = 2596.5, \( z = 0.20, p = 0.84 \)

Table 36: Distance from the clinic and termination

Terminators  Non-terminators

Normally shares bed  4  3  7
Own bed  46  105  151
50  108  158

\[ \chi^2 = 1.14, df = 1, p > 0.20 \]

Table 37: Shared beds and termination

Terminators  Non-terminators

Shared bedroom  33  65  98
Own bedroom  17  42  59
50  107  157

\[ \chi^2 = 0.21, df = 1, p > 0.50 \]

Table 38: Shared bedrooms and termination
Terminators Non-terminators

<table>
<thead>
<tr>
<th>Multi-occupation</th>
<th>1</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sole occupation</td>
<td>49</td>
<td>101</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>106</td>
<td>156</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.14, \text{ df } = 1, p > .70 \)

Table 39: Multi-occupied accommodation and termination

<table>
<thead>
<tr>
<th>Terminiators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>No inside toilet</td>
<td>1</td>
</tr>
<tr>
<td>Inside toilet available</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.0065, \text{ df } = 1, p > .90 \)

Table 40: Absence of inside toilet and termination

Comparison of terminating and non-terminating groups with respect to availability of:

EPI scores; \( \chi^2 = 23.26, \text{ df } = 1, p < .001 \) (significant)
WPS scores; \( \chi^2 = 22.99, \text{ df } = 1, p < .001 \) (significant)
JEPI scores; \( \chi^2 = 7.49, \text{ df } = 1, p < .01 \) (significant)

(WPS scores; \( \chi^2 = 28.07, \text{ df } = 1, p < .001 \) (significant)
CNAS scores; \( \chi^2 = 29.58, \text{ df } = 1, p < .001 \) (significant)
NV scores; \( \chi^2 = 47.13, \text{ df } = 1, p < .001 \) (significant)

(retrospective phase)

(NB: Analysis of the above scores in relation to termination was not conducted, in view of the predominance of cases for whom scores are available among the non-terminating groups.)

Table 41: List of significant differences between compared groups with respect to number of cases for whom specified scores are available

<table>
<thead>
<tr>
<th>Terminiators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>School medical officer</td>
<td>34</td>
</tr>
<tr>
<td>Self-referral</td>
<td>7</td>
</tr>
<tr>
<td>General practitioner</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

\( \chi^2 = 4.34, \text{ df } = 3, p > .20 \)

Table 42: Referral source and termination

<table>
<thead>
<tr>
<th>Terminiators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-referral</td>
<td>7</td>
</tr>
<tr>
<td>Other referral</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.99, \text{ df } = 1, p > .30 \)

Table 43: Self-referral and termination
Terminators: median waiting period, 13.7 weeks; range 0 weeks to 22 weeks (mean 13.92 weeks)
Non-terminators: median waiting period, 12.83 weeks; range 0 weeks to 37 weeks (mean 13.89 weeks)
Mann-Whitney "U" = 2575.0, z = 0.47, p = .64

Table 44: Waiting period and termination

<table>
<thead>
<tr>
<th></th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs prescribed</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Drugs not prescribed</td>
<td>21</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>43</td>
<td>101</td>
</tr>
</tbody>
</table>

(NB: Cases not prescribed an enuresis alarm excluded)

$\chi^2 = 0.43$, df = 1, p>.50

Table 45: Prescription of drugs and termination

<table>
<thead>
<tr>
<th></th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recorded alarm failure</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Other cases</td>
<td>41</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>108</td>
</tr>
</tbody>
</table>

$\chi^2 = 0.35$, df = 1, p>.50

Table 46: Alarm failure and termination

<table>
<thead>
<tr>
<th></th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-cooperation recorded</td>
<td>19</td>
<td>14</td>
</tr>
<tr>
<td>Non-cooperation not recorded</td>
<td>31</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>108</td>
</tr>
</tbody>
</table>

$\chi^2 = 11.50$, df = 1, p<.001 (significant)

Table 47: Non-cooperation and termination

<table>
<thead>
<tr>
<th></th>
<th>Terminators</th>
<th>Non-terminators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recorded non-awakening</td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td>Satisfactory awakening</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>108</td>
</tr>
</tbody>
</table>

$\chi^2 = 16.20$, df = 1, p<.001 (significant)

Table 48: Non-awakening and termination
Terminators | Non-terminators
---|---
Reported deep sleepers | 36 | 89 | 125
Others | 14 | 19 | 33
                                   | 50 | 108 | 158

(NB: deep sleep as reported by the mother)

\[ \chi^2 = 1.65, df = 1, p > .10 \]

Table 49: Deep sleep and termination

Mann-Whitney "U" = 2162.0, z = 2.04, p = .04

Table 50: Comparison of percentage of appointments missed by terminators and non-terminators

Terminators: median percentage appointments cancelled, 4.55%
Non-terminators: median percentage appointments cancelled, 0%
Mann-Whitney "U" = 2347, z = 1.24, p = .22

Table 51: Percentage of appointments cancelled and termination

Terminators | Non-terminators
---|---
Overlearning | 6 | 55 | 61
No overlearning | 37 | 46 | 83
                                   | 43 | 101 | 144

\[ \chi^2 = 18.64, df = 1, p < .001 \text{ (significant)} \]

Table 52: Overlearning and termination

Terminators | Non-terminators
---|---
Abandoned overlearning | 2 | 11 | 13
No abandoned overlearning | 41 | 90 | 131
                                   | 43 | 101 | 144

\[ \chi^2 = 0.77, df = 1, p > .30 \]

Table 53: Abandoned overlearning and termination
Terminators: median treatment duration, 13.33 weeks; range 0 to 53 weeks (mean 17.45 weeks)
Non-terminators: median treatment duration, 14.33 weeks (distribution incomplete beyond 56 weeks)
Mann-Whitney "U" = 2118, z = 1.23, p = .22

Table 54: Treatment duration and termination

By Kruskall-Wallis analysis of variance;
H = 2.32, df = 3, p>.50

Table 55: Social class and period before termination

Boys: mean time to termination, 24.06 weeks
Girls: mean time to termination, 13.19 weeks
Mann-Whitney "U" = 194, z = 1.63, p = .10

Table 56: Sex and period before termination

Spearman r_s = -.17, t = 1.21, df = 48, p>.20

Table 57: Age and period before termination

Month: 1 2 3 4 5 6 7 8 9 10 11 12
N terminating: 2 4 6 5 4 3 5 3 1 9 6 2
(N = 50)

x^2 = 12.88, df = 11, p>.30

Table 58: Month of the year and termination
Month: 1 2 4 5 6 7 8 10 11 12
N subsequently terminating: 5 5 6 7 3 7 4 6 2 5
(N = 50)

\[\chi^2 = 4.80, \text{ df} = 9, p > .80\]

Table 59: Month of first appointment and subsequent termination

<table>
<thead>
<tr>
<th>Appointments given:</th>
<th>1-10</th>
<th>over 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33</td>
<td>17</td>
</tr>
<tr>
<td>(N = 50)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[\chi^2 = 5.12, \text{ df} = 1, p < .05 \text{ (significant)}\]

Table 60: Appointments given and termination

Terminators: median wetting frequency, 2 nights per fortnight (mean 4.48 nights per fortnight)
Non-terminators: median wetting frequency, 1 night per fortnight
Mann-Whitney "U" = 1472.2, z = 2.76, p = .006 (significant)

Table 61: Severity of wetting, terminators, and non-terminators at penultimate appointment

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td>Girls</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>

\[\chi^2 = 0.73, \text{ df} = 1, p > .30\]

Table 62: Sex and speed of response

Slow responders: median age, 8 years; range 4 to 13 years (mean 8.16 years)
Rapid responders: median age, 7.5 years; range 4 to 15 years (mean 8.0 years)
Mann-Whitney "U" = 455.5, z = 0.35, p = .73

Table 63: Age and speed of response

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>10</td>
</tr>
<tr>
<td>2-3</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>9</td>
</tr>
<tr>
<td>4+</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

\[\chi^2 = 1.55, \text{ df} = 2, p > .30\]

Table 64: Number of somatic symptoms and speed of response
### Table 65: Number of psychologic symptoms and speed of response

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>7</td>
</tr>
<tr>
<td>2-3</td>
<td>16</td>
</tr>
<tr>
<td>4-5</td>
<td>2</td>
</tr>
<tr>
<td>6+</td>
<td>32</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>26</td>
<td>13</td>
</tr>
<tr>
<td>62</td>
<td>5</td>
</tr>
<tr>
<td>$\chi^2 = 5.08$, df = 3, $p &gt; .10$</td>
<td></td>
</tr>
</tbody>
</table>

### Table 66: Previous treatment experience and speed of response

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previously treated</td>
<td>16</td>
</tr>
<tr>
<td>Not previously treated</td>
<td>16</td>
</tr>
<tr>
<td>32</td>
<td>30</td>
</tr>
<tr>
<td>$\chi^2 = 0.06$, df = 1, $p &gt; .70$</td>
<td></td>
</tr>
</tbody>
</table>

### Table 67: Extraversion (on JEPI) and speed of response

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 1 SD below mean</td>
<td>6</td>
</tr>
<tr>
<td>Over 1 SD above mean</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>(using published norms)</td>
<td></td>
</tr>
<tr>
<td>$p &gt; .10$ (Fisher exact probability test)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 68: Neuroticism (on JEPI) and speed of response

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>12</td>
</tr>
<tr>
<td>Over 1 SD above mean</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>(using published norms)</td>
<td></td>
</tr>
<tr>
<td>$p &gt; .10$ (Fisher exact probability test)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 69: Type of enuresis and speed of response

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>27</td>
</tr>
<tr>
<td>Secondary</td>
<td>5</td>
</tr>
<tr>
<td>32</td>
<td>30</td>
</tr>
<tr>
<td>$\chi^2 = 0.20$, df = 1, $p &gt; .50$</td>
<td></td>
</tr>
<tr>
<td>Table 70: Irregularity of enuresis and speed of response</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Wet nights per week</td>
<td>Slow responders</td>
</tr>
<tr>
<td>3 or less</td>
<td>5</td>
</tr>
<tr>
<td>4-5</td>
<td>8</td>
</tr>
<tr>
<td>6-7</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>32</td>
</tr>
<tr>
<td>$\chi^2 = 0.03$, df = 1, p &gt; .80</td>
<td></td>
</tr>
</tbody>
</table>

| Table 71: Severity of enuresis and speed of response |
|-----------------------------|-----------------------------|-----------------------------|
| History of awakening        | Slow responders | Rapid responders |
| 5                           | 5              | 5              | 10            |
| 27                          | 25             | 25             | 52            |
|                             | 32             | 30             | 62            |
| $\chi^2 = 0.05$, df = 1, p > .80 |

| Table 72: Spontaneous awakening and speed of response |
|-----------------------------|-----------------------------|-----------------------------|
| Improved                   | Slow responders | Rapid responders |
| 5                           | 5              | 5              | 8             |
| 27                          | 27             | 27             | 54            |
|                             | 32             | 30             | 62            |
| $\chi^2 = 0.08$, df = 1, p > .70 |

| Table 73: Waiting-list improvement and speed of response |
|-----------------------------|-----------------------------|-----------------------------|
| Urgency of micturition      | Slow responders | Rapid responders |
| 17                          | 8              | 8              | 25            |
| Frequency of micturition    | Slow responders | Rapid responders |
| 13                          | 6              | 6              | 19            |
| 30                          | 14             | 14             | 44            |
| $\chi^2 = 0.09$, df = 1, p > .70 |

| Table 74: Additional eliminative disorders and speed of response |
|-----------------------------|-----------------------------|-----------------------------|
| Number of additional eliminative disorders | Slow responders | Rapid responders |
| 0-1                         | 18             | 21             | 39            |
| 2+                          | 14             | 9              | 23            |
|                             | 32             | 30             | 62            |
| $\chi^2 = 0.73$, df = 1, p > .30 |
Slow responders: median age, 34.5; range 26 to 49 (mean, 35.3 years)  
Rapid responders: median age, 36; range 27 to 56 (mean, 35.8 years)  
Mann-Whitney "U" = 327, z = 0.43, p = .67

Table 76: Mother's age and speed of response

<table>
<thead>
<tr>
<th></th>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Not employed</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>30</td>
</tr>
</tbody>
</table>

χ² = 0.04, df = 1, p>.80

Table 77: Mother's employment and speed of response

Slow responders: median extraversion score (EPI), 11; range 5 to 23 (mean score, 12.56)  
Rapid responders: median extraversion score (EPI), 13; range 2 to 23 (mean score, 11.96)  
Mann-Whitney "U" = 299.5, z = 0.70, p = .48

Table 78: Mother's extraversion and speed of response

Slow responders: median neuroticism score (EPI), 9; range 2 to 19 (mean score, 10.11)  
Rapid responders: median neuroticism score (EPI), 9; range 4 to 17 (mean score, 9.64)  
Mann-Whitney "U" = 322, z = 0.28, p = .78

Table 79: Mother's neuroticism and speed of response

Slow responders: median WPS score, 37; range 21 to 75 (mean score, 38.48)  
Rapid responders: median WPS score, 28; range 7 to 51 (mean score, 27.74)  
Mann-Whitney "U" = 181, z = 2.20, p = .03 (significant)

Table 80: Mother's anxiety (WPS) and speed of response

Social class | Slow responders | Rapid responders |
-------------|----------------|------------------|
I & II       | 9              | 13               | 22               |
III, IV & V  | 20             | 17               | 37               |
                | 29             | 30               | 59               |
χ² = 0.50, df = 1, p>.30

Table 81: Social class and speed of response(a)

Social class | Slow responders | Rapid responders |
-------------|----------------|------------------|
I & II       | 9              | 13               | 22               |
III          | 15             | 14               | 29               |
                | 24             | 27               | 51               |
χ² = 0.23, df = 1, p>.50

Table 82: Social class and speed of response (b)
<table>
<thead>
<tr>
<th>No. of children</th>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>4+</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>30</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 1.65, \text{df} = 2, \ p > .30 \]

**Table 83: Family size and speed of response**

<table>
<thead>
<tr>
<th>Rank position among siblings</th>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st (or only)</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>2nd</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>3rd or above</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>30</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 3.27, \text{df} = 2, \ p > .10 \]

**Table 84: Family position and speed of response**

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youngest</td>
<td>9</td>
</tr>
<tr>
<td>Eldest</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

(NB - excluding twins and only children)

\[ \chi^2 = 1.23, \text{df} = 1, \ p > .20 \]

**Table 85: Youngest and eldest children and speed of response**

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive family history</td>
<td>13</td>
</tr>
<tr>
<td>No family history</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 1.62, \text{df} = 1, \ p > .20 \]

**Table 86: Family history and speed of response**

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared bed</td>
<td>4</td>
</tr>
<tr>
<td>Own bed</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 2.11, \text{df} = 1, \ p > .10 \]

**Table 87: Shared beds and speed of response**
<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared bedroom</td>
<td>23</td>
</tr>
<tr>
<td>Own bedroom</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>31</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.41, \text{df} = 1, \ p > 0.50 \]

Table 88: Shared bedrooms and speed of response

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-occupation</td>
<td>0</td>
</tr>
<tr>
<td>Sole occupation</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>31</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 1.55, \text{df} = 1, \ p > 0.20 \]

Table 89: Multi-occupied accommodation and speed of response

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of separation</td>
<td>2</td>
</tr>
<tr>
<td>No history of separation</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.008, \text{df} = 1, \ p > 0.90 \]

Table 90: History of separation and speed of response

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse familial circumstances</td>
<td>7</td>
</tr>
<tr>
<td>Other cases</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 5.17, \text{df} = 1, \ p < 0.05 \text{ (significant)} \]

Table 91: Adverse familial circumstances and speed of response

<table>
<thead>
<tr>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>School medical officer</td>
<td>17</td>
</tr>
<tr>
<td>Self-referral</td>
<td>6</td>
</tr>
<tr>
<td>General practitioner</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>27</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 2.47, \text{df} = 2, \ p > 0.20 \]

Table 92: Referral source and speed of response
Slow responders: median waiting period, 14 weeks; range 3 to 24 weeks (mean, 14.0 weeks)
Rapid responders: median waiting period, 12.5 weeks; range 4 to 22 weeks (mean, 13.4 weeks)
Mann-Whitney "U" = 429.5, z = 0.71, p = .48

Table 93: Waiting period and speed of response

<table>
<thead>
<tr>
<th></th>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recorded alarm failure</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Other cases</td>
<td>30</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>30</td>
</tr>
</tbody>
</table>
\[ \chi^2 = 0.20, df = 1, p > .50 \]

Table 94: Alarm failure and speed of response

<table>
<thead>
<tr>
<th></th>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-cooperation recorded</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Non-cooperation not recorded</td>
<td>30</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>30</td>
</tr>
</tbody>
</table>
\[ \chi^2 = 0.20, df = 1, p > .50 \]

Table 95: Non-cooperation and speed of response

<table>
<thead>
<tr>
<th></th>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recorded non-awakening</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Satisfactory awakening</td>
<td>24</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>30</td>
</tr>
</tbody>
</table>
\[ \chi^2 = 4.24, df = 1, p < .05 \] (significant)

Table 96: Non-awakening and speed of response

<table>
<thead>
<tr>
<th></th>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reported deep sleepers</td>
<td>30</td>
<td>24</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>30</td>
</tr>
</tbody>
</table>
\[ \chi^2 = 1.53, df = 1, p > .20 \]

Table 97: Deep sleep and speed of response

<table>
<thead>
<tr>
<th></th>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs prescribed with alarm</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Drugs not prescribed with alarm</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>28</td>
</tr>
</tbody>
</table>
\[ \chi^2 = 5.42, df = 1, p < .02 \] (significant)

Table 98: Prescription of drugs and speed of response
Slow responders  Rapid responders

<table>
<thead>
<tr>
<th></th>
<th>Slow responders</th>
<th>Rapid responders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drugs prescribed for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>holiday periods only</td>
<td>2</td>
<td>1 3</td>
</tr>
<tr>
<td>Drugs prescribed for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>other reasons</td>
<td>10</td>
<td>2 12</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>3 15</td>
</tr>
</tbody>
</table>

p > .05 (Fisher exact probability test)

Table 99: Prescription of drugs for holiday periods and speed of response

By Mann-Whitney "U", z = 1.54, p = .12

Table 100: Comparison of period from discharge to data collection; relapsed and non-relapsed cases

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>15</td>
<td>57 72</td>
</tr>
<tr>
<td>Girls</td>
<td>11</td>
<td>25 36</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>82 108</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.77, \text{ df} = 1, p > .30 \]

Table 101: Sex and relapse

Boys: median period before relapse, 21 weeks, range 2 to 56 weeks
Girls: median period before relapse, 33 weeks, range 15 to 85 weeks
Mann-Whitney "U" = 50, z = 1.04, p = .30

Table 102: Sex and period before relapse

Relapsed cases: median age, 7.5 years, range 4 to 15 (mean age, 7.96)
Non-relapsed cases: median age, 7.0 years, range 4 to 15 (mean age, 7.57)
Mann-Whitney "U" = 993, z = 0.53, p = .60

Table 103: Age and relapse

Spearman Rank \( r_s = -0.47, t = -2.48, p < .05 \) (significant)

Table 104: Correlation of age with period before relapse

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 or less</td>
<td>11</td>
<td>49 60</td>
</tr>
<tr>
<td>3-4</td>
<td>8</td>
<td>20 28</td>
</tr>
<tr>
<td>5 or more</td>
<td>7</td>
<td>12 19</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>81 107</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 3.07, \text{ df} = 2, p > .20 \]

Table 105: Number of somatic symptoms and relapse
<table>
<thead>
<tr>
<th>Number of Symptoms</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>2-3</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>4-5</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>6 or more</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>81</td>
</tr>
</tbody>
</table>

\( \chi^2 = 3.25, df = 3, p > .30 \)

**Table 106: Number of psychologic symptoms and relapse**

<table>
<thead>
<tr>
<th>Treatment History</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previously treated</td>
<td>12</td>
<td>31</td>
</tr>
<tr>
<td>Not previously treated</td>
<td>14</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>81</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.23, df = 1, p > .50 \)

**Table 107: Previous treatment experience and relapse**

<table>
<thead>
<tr>
<th>Extraversion (JEPI)</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over one SD above the mean</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Over one SD below the mean (using published norms)</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

\( p > .05 \) (Fisher exact probability test)

**Table 108: Extraversion (JEPI) and relapse**

<table>
<thead>
<tr>
<th>Neuroticism (JEPI)</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>9</td>
<td>25</td>
</tr>
<tr>
<td>Over 1 SD above the mean (using published norms)</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>30</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.40, df = 1, p > .50 \)

**Table 109: Neuroticism (JEPI) and relapse**

<table>
<thead>
<tr>
<th>Type of Enuresis</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>23</td>
<td>70</td>
</tr>
<tr>
<td>Secondary</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>81</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.0043, df = 1, p > .90 \)

**Table 110: Type of enuresis and relapse**
<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>20</td>
<td>48</td>
</tr>
<tr>
<td>Irregular</td>
<td>6</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>81</td>
</tr>
</tbody>
</table>

\( \chi^2 = 1.94, \ df = 1, \ p > .10 \)

**Table III - Irregularity of enuresis and relapse**

<table>
<thead>
<tr>
<th>Wet nights per week</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 or less</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>4-5</td>
<td>9</td>
<td>24</td>
</tr>
<tr>
<td>6-7</td>
<td>12</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>81</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.29, \ df = 2, \ p > .80 \)

**Table 112: Severity of enuresis and relapse**

<table>
<thead>
<tr>
<th>History of awakening</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of awakening</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>No history of awakening</td>
<td>19</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>81</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.0092, \ df = 1, \ p > .90 \)

**Table 113: Spontaneous awakening and relapse**

<table>
<thead>
<tr>
<th>Improved</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Did not improve</td>
<td>20</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>81</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.05, \ df = 1, \ p > .80 \)

**Table 114: Waiting-list improvement and relapse**

<table>
<thead>
<tr>
<th>0</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>54</td>
<td>66</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>2+</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>81</td>
</tr>
</tbody>
</table>

\( \chi^2 = 4.68, \ df = 2, \ p > .05 \)

**Table 115: Number of additional eliminative disorders and relapse**

- 248 -
### Table 116: Additional eliminative disorders and relapse

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgency of micturition</td>
<td>10</td>
<td>19</td>
<td>29</td>
</tr>
<tr>
<td>Frequency of micturition</td>
<td>8</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>Diurnal enuresis</td>
<td>3</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>42</td>
<td>63</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.04, \text{df} = 2, p > .98 \)

### Table 117: Multi-occupied accommodation and relapse

<table>
<thead>
<tr>
<th>Accommodation Type</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-occupation</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Sole occupation</td>
<td>22</td>
<td>79</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>81</td>
<td>106</td>
</tr>
</tbody>
</table>

\( \chi^2 = 2.03, \text{df} = 1, p > .10 \)

### Table 118: Absence of inside toilet and relapse

<table>
<thead>
<tr>
<th>Availability</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>No inside toilet</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Inside toilet</td>
<td>24</td>
<td>80</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>82</td>
<td>108</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.41, \text{df} = 1, p > .50 \)

### Table 119: Shared bedrooms and relapse

<table>
<thead>
<tr>
<th>Bedroom Type</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared bedroom</td>
<td>15</td>
<td>50</td>
<td>65</td>
</tr>
<tr>
<td>Own bedroom</td>
<td>11</td>
<td>31</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>81</td>
<td>107</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.02, \text{df} = 1, p > .80 \)

### Table 120: Social class and relapse

<table>
<thead>
<tr>
<th>Social Class</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>I and II</td>
<td>8</td>
<td>35</td>
<td>47</td>
</tr>
<tr>
<td>III</td>
<td>12</td>
<td>33</td>
<td>45</td>
</tr>
<tr>
<td>IV and V</td>
<td>4</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>77</td>
<td>101</td>
</tr>
</tbody>
</table>

\( \chi^2 = 1.18, \text{df} = 2, p > .50 \)

By Kruskall-Wallis analysis of variance, \( H = 0.97, \text{df} = 2, p > .50 \)

### Table 121: Social class and period before relapse
<table>
<thead>
<tr>
<th>No. of children</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>10</td>
<td>31</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>27</td>
</tr>
<tr>
<td>4+</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>26</td>
<td>82</td>
<td>108</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 1.24, \text{ df } = 2, \ p > .50 \]

**Table 122: Family size and relapse**

<table>
<thead>
<tr>
<th>Rank position among siblings</th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st or only</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>5th or above</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>26</td>
<td>82</td>
<td>108</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 3.45, \text{ df } = 4, \ p > .30 \]

**Table 123: Family position and relapse**

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed full-time</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Employed part-time</td>
<td>8</td>
<td>27</td>
</tr>
<tr>
<td>Not employed</td>
<td>17</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>82</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.78, \text{ df } = 2, \ p > .50 \]

**Table 124: Mother's employment and relapse**

Relapsed: median age, 33 years, range 26 to 56 (mean age, 35.17 years)
Non-relapsed: median age, 33 years, range 24 to 56 (mean age, 34.85 years)
Mann-Whitney "U" = 1435.5, \( z = 0.01, \ p = .99 \)

**Table 125: Mother's age and relapse**

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive family history</td>
<td>15</td>
<td>40</td>
</tr>
<tr>
<td>No family history</td>
<td>11</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>82</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.32, \text{ df } = 1, \ p > .50 \]

**Table 126: Family history and relapse**
<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youngest children</td>
<td>9</td>
<td>28</td>
</tr>
<tr>
<td>Eldest children</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>41</td>
</tr>
</tbody>
</table>

NB One-child families and twins excluded.

\[ \chi^2 = 0.65, \text{df} = 1, p > .30 \]

**Table 127: Youngest and eldest children and relapse**

By Kruskall-Wallis analysis of variance, \( H = 0.83, \text{df} = 2, p > .50 \)

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of separation</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>No history of separation</td>
<td>23</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>82</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.02, \text{df} = 1, p = .90 \]

**Table 128: Family size and period before relapse**

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse familial circumstances</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Other cases</td>
<td>22</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>82</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.02, \text{df} = 1, p > .80 \]

**Table 129: History of separation and relapse**

Relapsed: median extraversion (EPI) score, 13, range 7 to 23
(mean score, 12.65)

Non-relapsed: median extraversion (EPI) score, 11, range 2 to 21
(mean score, 11.32)

Mann-Whitney "U" = 659.5, \( z = 1.39, p = .16 \)

**Table 130: Adverse familial circumstances and relapse**

Relapsed: median neuroticism (EPI) score, 12, range 4 to 24
(mean score, 11.96)

Non-relapsed: median neuroticism (EPI) score, 11, range 2 to 20
(mean score, 11.49)

Mann-Whitney "U" = 807, \( z = 0.08, p = .94 \)

**Table 131: Mother's extraversion and relapse**

**Table 132: Mother's neuroticism and relapse**
Relapsed: median WPS score, 33, range 14 to 74 (mean score, 34.95)
Non-relapsed: median WPS score, 32, range 7 to 75 (mean score, 33.26)
Mann-Whitney "U" = 614, z = 0.39, p = .70

Table 133: Mother's anxiety (WPS) and relapse

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-referral</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>Other referral</td>
<td>19</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>82</td>
</tr>
</tbody>
</table>

$\chi^2 = 0.15$, df = 1, p > .50

Table 134: Self-referral and relapse

Relapsed: median duration, 12 weeks, range 5 to 47 weeks (mean, 16.65 weeks)
Non-relapsed: median duration, 15 weeks, range 4 to 56 weeks (mean, 18.39 weeks)
Mann-Whitney "U" = 865, z = 1.03, p = 0.30

Table 135: Duration of treatment and relapse

Spearman Rank $r_s = .34$, $t = 1.72$, p > .05

Table 136: Duration of treatment and period before relapse

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enuresis alarm</td>
<td>23</td>
<td>78</td>
</tr>
<tr>
<td>No enuresis alarm</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>82</td>
</tr>
</tbody>
</table>

$\chi^2 = 0.55$, df = 1, p > .30

Table 137: Type of treatment and relapse

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm plus adjuvant drugs</td>
<td>8</td>
<td>36</td>
</tr>
<tr>
<td>Enuresis alarm alone</td>
<td>15</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>78</td>
</tr>
</tbody>
</table>

$\chi^2 = 0.53$, df = 1, p > .30

Table 138: Use of adjuvant drugs and relapse

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-cooperation recorded</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Non-cooperation not recorded</td>
<td>25</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>82</td>
</tr>
</tbody>
</table>

$\chi^2 = 1.57$, df = 1, p > .20

Table 139: Non-cooperation and relapse
<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recorded alarm failure</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Other cases</td>
<td>24</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>82</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.34, \text{ df} = 1, p > 0.50 \)

Table 140: Alarm failure and relapse

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recorded non-awakening</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Satisfactory awakening</td>
<td>24</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>82</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.13, \text{ df} = 1, p > 0.70 \)

Table 141: Non-awakening and relapse

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep sleepers</td>
<td>21</td>
<td>68</td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>82</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.0019, \text{ df} = 1, p > 0.96 \)

Table 142: Reported deep sleep and relapse

Mann-Whitney "U" = 1016, \( z = 0.41, p = 0.62 \)

Table 143: Percentage of appointments missed and relapse

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overlearning</td>
<td>7</td>
<td>48</td>
</tr>
<tr>
<td>No overlearning</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>78</td>
</tr>
</tbody>
</table>

\( \chi^2 = 1.24, \text{ df} = 1, p < 0.02 \) (significant)

Table 144: Overlearning and relapse

<table>
<thead>
<tr>
<th></th>
<th>Relapsed</th>
<th>Non-relapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abandoned overlearning</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>No abandoned overlearning</td>
<td>24</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>82</td>
</tr>
</tbody>
</table>

\( \chi^2 = 0.012, \text{ df} = 1, p > 0.90 \)

Table 145: Abandoned overlearning and relapse

\( \chi^2 = 10.87, \text{ df} = 3, p < 0.02 \) (significant)

Table 146: Comparison of wetting frequencies between non-attenders and attenders
Table 147: Social class and PE score

<table>
<thead>
<tr>
<th>Social class</th>
<th>1-3</th>
<th>4</th>
<th>5</th>
<th>10</th>
<th>26</th>
<th>12</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-II</td>
<td>10</td>
<td>26</td>
<td>12</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>9</td>
<td>33</td>
<td>17</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV-V</td>
<td>2</td>
<td>10</td>
<td>7</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>69</td>
<td>36</td>
<td>126</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$\chi^2 = 1.70$, df = 4, $p > .70$

Table 148: Sex and PE score

<table>
<thead>
<tr>
<th>Social class</th>
<th>PE score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-3</td>
</tr>
<tr>
<td>Boys</td>
<td>14</td>
</tr>
<tr>
<td>Girls</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

$\chi^2 = 0.32$, df = 2, $p > .98$

Table 149: Social class and CE score

<table>
<thead>
<tr>
<th>Social class</th>
<th>CE score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-3</td>
</tr>
<tr>
<td>I-II</td>
<td>11</td>
</tr>
<tr>
<td>III</td>
<td>14</td>
</tr>
<tr>
<td>IV-V</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>33</td>
</tr>
</tbody>
</table>

$\chi^2 = 3.91$, df = 4, $p > .30$

Table 150: Sex and CE score

<table>
<thead>
<tr>
<th>Social class</th>
<th>CE score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-2</td>
</tr>
<tr>
<td>Boys</td>
<td>5</td>
</tr>
<tr>
<td>Girls</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>

$\chi^2 = 7.56$, df = 3, $p > .05$

By Kruskall-Wallis analysis of variance, $H = 0.11$, df = 2, $p > .90$

Table 151: Age and PE score

By Kruskall-Wallis analysis of variance, $H = 11.78$, df = 3, $p < .01$ (significant)

Table 152: Age and CE score

By Kruskall-Wallis analysis of variance, $H = 7.60$, df = 3, $p > .05$

Table 153: Severity of enuresis and CE score
By Kruskall-Wallis analysis of variance, \( H = 0.71, \) df = 2, \( p = .70 \)

Table 154: Severity of enuresis and PE score

<table>
<thead>
<tr>
<th>CE score</th>
<th>1-4</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>70</td>
<td>47</td>
</tr>
<tr>
<td>Secondary</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>74</td>
<td>55</td>
</tr>
</tbody>
</table>

\( \chi^2 = 2.13, \) df = 1, \( p>.10 \)

Table 155: Type of enuresis and CE score

<table>
<thead>
<tr>
<th>CE score</th>
<th>1-2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive family history</td>
<td>2</td>
<td>7</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>No family history</td>
<td>9</td>
<td>16</td>
<td>29</td>
<td>32</td>
</tr>
</tbody>
</table>

\( \chi^2 = 3.62, \) df = 3, \( p>.30 \)

Table 156: Family history and CE score

<table>
<thead>
<tr>
<th>PE score</th>
<th>2-3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive family history</td>
<td>5</td>
<td>26</td>
<td>17</td>
</tr>
<tr>
<td>No family history</td>
<td>19</td>
<td>51</td>
<td>20</td>
</tr>
</tbody>
</table>

\( \chi^2 = 4.13, \) df = 2, \( p>.10 \)

Table 157: Family history and PE score

<table>
<thead>
<tr>
<th>PE score</th>
<th>1-3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3</td>
<td>9</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>24</td>
<td>28</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td>20</td>
</tr>
</tbody>
</table>

\( \chi^2 = 12.0, \) df = 4, \( p<.02 \) (significant)

Table 158: Association of CE and PE scores
Table 159: PE score and termination

<table>
<thead>
<tr>
<th>PE score</th>
<th>1-3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminators</td>
<td>6</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Non-terminators</td>
<td>13</td>
<td>51</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>65</td>
<td>30</td>
</tr>
</tbody>
</table>

$\chi^2 = 1.23$, df = 2, $p > .50$

Table 160: PE score and speed of response

<table>
<thead>
<tr>
<th>PE score</th>
<th>1-3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow responders</td>
<td>9</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>Rapid responders</td>
<td>3</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>34</td>
<td>18</td>
</tr>
</tbody>
</table>

$\chi^2 = 0.43$, df = 2, $p > .80$

Table 161: CE score and speed of response

<table>
<thead>
<tr>
<th>CE score</th>
<th>1-2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow responders</td>
<td>8</td>
<td>12</td>
<td>17</td>
<td>37</td>
</tr>
<tr>
<td>Rapid responders</td>
<td>2</td>
<td>5</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>17</td>
<td>30</td>
<td>57</td>
</tr>
</tbody>
</table>

$\chi^2 = 2.14$, df = 2, $p > .30$

Table 162: CE score and termination

<table>
<thead>
<tr>
<th>CE score</th>
<th>1-2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminators</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Non-terminators</td>
<td>4</td>
<td>12</td>
<td>30</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>20</td>
<td>33</td>
<td>46</td>
</tr>
</tbody>
</table>

$\chi^2 = 11.05$, df = 3, $p < .02$ (significant)

Table 163: PE score and period before termination

By Kruskall-Wallis analysis of variance, $H = 4.92$, df = 2, $p > .05$

Table 164: CE score and period before termination

By Kruskall-Wallis analysis of variance, $H = 5.64$, df = 2, $p > .05$
By Kruskall-Wallis analysis of variance, $H = 1.69$, df = 1, $p > .10$

Table 165: PE score and wetting frequency at termination

By Kruskall-Wallis analysis of variance, $H = 0.21$, df = 2, $p > .90$

Table 166: CE score and wetting frequency at termination

<table>
<thead>
<tr>
<th>CRE score</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience of relapse</td>
<td>9</td>
<td>13</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Other cases</td>
<td>56</td>
<td>25</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>65</td>
<td>38</td>
<td>25</td>
<td>16</td>
<td>144</td>
</tr>
</tbody>
</table>

$\chi^2 = 7.81$, df = 3, $p > .05$

Table 167: Prior experience of relapse and CRE score

<table>
<thead>
<tr>
<th>PRE score</th>
<th>1</th>
<th>2</th>
<th>3-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience of relapse</td>
<td>8</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Other cases</td>
<td>26</td>
<td>58</td>
<td>15</td>
</tr>
<tr>
<td>34</td>
<td>67</td>
<td>23</td>
<td>124</td>
</tr>
</tbody>
</table>

$\chi^2 = 5.18$, df = 2, $p > .05$

Table 168: Prior experience of relapse and PRE score

<table>
<thead>
<tr>
<th>PRE score</th>
<th>1-2</th>
<th>3-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relapsed</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Non-relapsed</td>
<td>87</td>
<td>19</td>
</tr>
<tr>
<td>101</td>
<td>23</td>
<td>124</td>
</tr>
</tbody>
</table>

$\chi^2 = 0.01$, df = 1, $p > .80$

Table 169: PRE score and relapse

<table>
<thead>
<tr>
<th>CRE score</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relapsed</td>
<td>11</td>
<td>3</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Non-relapsed</td>
<td>54</td>
<td>35</td>
<td>19</td>
<td>14</td>
</tr>
<tr>
<td>65</td>
<td>38</td>
<td>25</td>
<td>16</td>
<td>144</td>
</tr>
</tbody>
</table>

$\chi^2 = 3.30$, df = 3, $p > .30$

Table 170: CRE score and relapse
By Kruskall-Wallis analysis of variance, $H = 1.53, df = 1, p > .20$

**Table 171: PRE score and period before relapse**

By Kruskall-Wallis analysis of variance, $H = 0.003, df = 1, p > .95$

**Table 172: CRE score and period before relapse**

Slow responders: median CMAS score, 12 range 1 to 28
Rapid responders: median CMAS score, 10.5, range 0 to 28
Mann-Whitney "U" = 275, $z = 0.50, p = .62$

**Table 173: CMAS score and speed of response**

By Kruskall-Wallis analysis of variance, $H = 3.01, df = 5, p > .50$

**Table 174: CMAS score and severity of enuresis**

Primary enuretics: median CMAS score, 16, range 0 to 34
Secondary enuretics: median CMAS score, 10, range 5 to 15
Mann-Whitney "U" = 281, $z = 1.87, p = .06$

**Table 175: CMAS score and type of enuresis**

Positive family history: median CMAS score, 16, range 1 to 29
No family history: Median CMAS score, 13, range 0 to 34
Mann-Whitney "U" = 908, $z = 1.00, p = .32$

**Table 176: CMAS score and family history**

By Kruskall-Wallis analysis of variance, $H = 1.60, df = 2, p > .30$

**Table 177: Association of PE and WPS scores**

By Kruskall-Wallis analysis of variance, $H = 0.004, df = 2, p > .90$

**Table 178: Association of PE and CMAS scores**

By Kruskall-Wallis analysis of variance, $H = 3.79, df = 3, p > .20$

**Table 179: Association of CE and WPS scores**

By Kruskall-Wallis analysis of variance, $H = 3.22, df = 3, p > .30$

**Table 180: Association of CE and CMAS scores**

Boys: median CCS score, 1.45, range 1.225 to 1.75
Girls: median CCS score, 1.40, range 0.80 to 1.70
Mann-Whitney "U" = 1652.5, $z = 0.34, p = .73$

**Table 181: CCS score and sex**
Boys: median PIS score, 1.45, range 1.25 to 3.10
Girls: median PIS score, 1.45, range 1.25 to 3.425
Mann-Whitney "U" = 1854, z = 1.21, p = .23

Table 182: PIS score and sex

Boys: median NV score, 13.5, range 1 to 25
Girls: median NV score, 13, range 2 to 25
Mann-Whitney "U" = 1327, z = 0.51, p = .61

Table 183: NV score and sex

Spearman Rank r_s = -0.17, t = 1.92, p>.05

Table 184: Correlation of PIS score with age

Spearman Rank r_s = 0.10, t = 1.05, p>.20

Table 185: Correlation of NV score with age

Spearman Rank r_s = 0.31, t = 3.50, p=.001 (significant)

Table 186: Correlation of CCS score with age

By Kruskall-Wallis analysis of variance, H = 1.69, df = 6, p>.90

Table 187: PIS score and wetting frequency

By Kruskall-Wallis analysis of variance, H = 4.48, df = 6, p>.50

Table 188: CCS score and wetting frequency

By Kruskall-Wallis analysis of variance, H = 3.24, df = 5, p>.50

Table 189: NV score and wetting frequency

Primary enuretics: median PIS score, 1.45, range 1.25 to 3.425
Secondary enuretics: median PIS score, 1.45, range 1.25 to 2.30
Mann-Whitney "U" = 696, z = 0.28, p = .78

Table 190: PIS score and type of enuresis

Primary enuretics: median CCS score, 1.40, range 0.80 to 1.75
Secondary enuretics: median CCS score, 1.50, range 1.325 to 1.70
Mann-Whitney "U" 524.5, z = 1.09, p = .28

Table 191: CCS score and type of enuresis

Primary enuretics: median NV score, 13, range 1 to 25
Secondary enuretics: median NV score, 13, range 9 to 24
Mann-Whitney "U" = 426, z = 0.22, p = .83

Table 192: NV score and type of enuresis
By Kruskall-Wallis analysis of variance, $H = 1.35$, df = 4, p > .80

**Table 193**: CCS score and social class

By Kruskall-Wallis analysis of variance, $H = 13.19$, df = 4, p < .02 (significant)

**Table 194**: PIS score and social class

By Kruskall-Wallis analysis of variance, $H = 10.91$, df = 4, p < .05 (significant)

**Table 195**: NV score and social class

Positive family history: median PIS score, 1.70, range 1.25 to 3.42
No family history: median PIS score, 1.45, range 1.25 to 3.10
Mann-Whitney "U" = 1987.5, $z = 0.16$, p = .87

**Table 196**: PIS score and family history

Positive family history: median NV score, 12, range 2 to 25
No family history: median NV score, 14, range 1 to 25
Mann-Whitney "U" = 1185, $z = 0.82$, p = .41

**Table 197**: NV score and family history

Positive family history: median CCS score, 1.40, range 1.25 to 1.70
No family history: median CCS score, 1.45, range 0.80 to 1.75
Mann-Whitney "U" = 1227.5, $z = 1.99$, p = .047 (significant)

**Table 198**: CCS score and family history

Spearman Rank $r_s = 0.16$, $t = 1.56$, p > .10

**Table 199**: Correlation of PIS with WPS scores

Spearman Rank $r_s = -0.09$, $t = 0.86$, p > .20

**Table 200**: Correlation of NV with WPS scores

Spearman Rank $r_s = 0.05$, $t = 0.45$, p > .20

**Table 201**: Correlation of CCS with WPS scores

Spearman Rank $r_s = 0.05$, $t = 0.54$, p > .20

**Table 202**: Correlation of CCS with PIS scores

Spearman Rank $r_s = 0.22$, $t = 2.09$, p < .05 (significant)

**Table 203**: Correlation of CCS with CMAS scores
Spearman Rank $r_s = 0.07$, $t = 0.69$, $p > .20$

Table 204: Correlation of CCS with NV scores

Spearman Rank $r_s = 0.12$, $t = 1.13$, $p > .20$

Table 205: Correlation of PIS with CMAS scores

Spearman Rank $r_s = -0.01$, $t = 0.10$, $p > .20$

Table 206: Correlation of PIS with NV scores

Spearman Rank $r_s = -0.23$, $t = 2.23$, $p < .05$ (significant)

Table 207: Correlation of NV with CMAS scores

By Kruskall-Wallis analysis of variance, $H = 7.62$, $df = 3$, $p > .05$

Table 208: Association of CCS and CE scores

By Kruskall-Wallis analysis of variance, $H = 5.12$, $df = 3$, $p > .10$

Table 209: Association of PIS and CE scores

By Kruskall-Wallis analysis of variance, $H = 0.31$, $df = 3$, $p > .95$

Table 210: Association of CE and NV scores

By Kruskall-Wallis analysis of variance, $H = 1.22$, $df = 2$, $p > .50$

Table 211: Association of CCS and PE scores

By Kruskall-Wallis analysis of variance, $H = 3.33$, $df = 2$, $p > .10$

Table 212: Association of PIS and PE scores

By Kruskall-Wallis analysis of variance, $H = 0.42$, $df = 2$, $p > .95$

Table 213: Association of PE and NV scores

Slow responders: median PIS score, 1.70, range 1.23 to 3.10
Rapid responders: median PIS score, 1.45, range 1.25 to 2.25
Mann-Whitney "U" = 313, $z = 1.50$, $p = .13$

Table 214: PIS score and speed of response

Slow responders: median NV score, 14, range 5 to 25
Rapid responders: median NV score, 12, range 2 to 25
Mann-Whitney "U" = 301, $z = 1.06$, $p = .29$

Table 215: NV score and speed of response
Slow responders: median CCS score, 1.375, range 1.25 to 1.75
Rapid responders: median CCS score, 1.40, range 1.225 to 1.75
Mann-Whitney "U" = 348.5, z = 0.23, p = .80

Table 216: CCS score and speed of response

Terminators: median CCS score, 1.40, range 0.80 to 1.75
Non-terminators: median CCS score, 1.45, range 1.225 to 1.75
Mann-Whitney "U" = 927.5, z = 0.37, p = .71

Table 217: CCS score and termination

Spearman Rank $r_s = 0.012$, t = 0.06, p>.10

Table 218: Correlation of CCS score with period before termination

By Kruskall-Wallis analysis of variance, H = 3.22, df = 2, p>.20

Table 219: CCS score and wetting frequency at termination

Terminators: median PIS score, 1.85, range 1.25 to 3.425
Non-terminators: median PIS score, 1.45, range 1.25 to 3.10
Mann-Whitney "U" = 822.5, z = 2.54, p = .01 (significant)

Table 220: PIS score and termination

Spearman Rank $r_s = 0.09$, p>.10

Table 221: PIS score and period before termination

By Kruskall-Wallis analysis of variance, H = 1.65, df = 2, p>.30

Table 222: PIS score and wetting frequency at termination
APPENDIX F

THE CHILDREN'S MANIFEST ANXIETY SCALE

Reproduced below is the modified form of the Children's Manifest Anxiety Scale (Castaneda, McCandless and Palermo, 1956) used in the present study (see chapter nine). Underlining, not present on the scales issued to children, is added to indicate words or phrases added to or replacing those of the original.

C.M.A.S.

Name

Read each question carefully. Put a circle round the word YES if you think it is true about you. Put a circle round the word NO if you think it is not true about you.

1. It is hard for me to keep my mind on anything
2. I feel nervous when someone watches me work
3. I feel I have to be best in everything
4. I blush easily
5. I notice my heart beats very fast sometimes
6. At times I feel like shouting
7. I wish I could be very far from here
8. Other people seem to do things easier than I can
9. I am secretly afraid of a lot of things
10. I feel that other people do not like the way I do things
11. I often feel alone even when there are people around me
12. I have trouble making up my mind
13. I get nervous when things do not go the right way for me
14. I worry most of the time
15. I worry about what my parents will say to me  
16. I often have trouble getting my breath  
17. I get angry easily  
18. My hands feel sweaty  
19. I have to go to the toilet more than most people  
20. Other children are happier than I am  
21. I worry about what other people think about me  
22. I have trouble swallowing  
23. I have worried about things that did not really make any difference later  
24. My feelings get hurt easily  
25. I worry about doing the right things  
26. I worry about what is going to happen  
27. It is hard for me to go to sleep at night  
28. I worry about how well I am doing at school  
29. My feelings get hurt easily when I am told off  
30. I often get lonely when I am with people  
31. I feel someone will tell me I do things the wrong way  
32. I am afraid of the dark  
33. It is hard for me to keep my mind on my school work  
34. Often I feel sick in my stomach  
35. I worry when I go to bed at night  
36. I often do things I wish I had never done  
37. I get headaches  
38. I often worry about what could happen to my parents  
39. I get tired easily  
40. I have bad dreams
41. I am nervous

42. I often worry about something bad happening to me

Colman, Mackay and Fidell (1972) have published English normative data for the CMAS, finding significantly higher scores among girls than boys, and noting a significantly lower score among 12 year old boys than 11 year old boys. Their data, for a sample of 395 children, is presented below:

<table>
<thead>
<tr>
<th>Age 11</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>98</td>
<td>18.46</td>
<td>6.58</td>
</tr>
<tr>
<td>Girls</td>
<td>93</td>
<td>21.22</td>
<td>4.48</td>
</tr>
<tr>
<td>Age 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>121</td>
<td>16.26</td>
<td>6.77</td>
</tr>
<tr>
<td>Girls</td>
<td>83</td>
<td>20.09</td>
<td>6.95</td>
</tr>
</tbody>
</table>
BIBLIOGRAPHY


J. Pediat., 58, 806-819.

New York, Appleton-Century, Ch. XXVII.

B.M.J., 2, 787-790.


Pediatrics, 17, 849-855.

The Medical Press, July 22nd.

Bicknell, F. (1959) Enuresis or bedwetting


Paper presented at colloquium on recent advances in knowledge of bladder control in children, Newcastle-upon-Tyne.

Prevalence among children aged 4-7 years.
Lancet, 1, 850-852.

Med. J. Aust., 2, 141-143.


II. Med. J. Aust., 2, 185-188.


Lancet, 2, 1167-1170.

Am. J. Psychother., 25, 564-578.

B.M.J., 1, 1345-1347.


University of London Press.


University of London Press.

J. Exp. Psychol., 45, 120-125.


Ferenczi, S. (1925) Psycho-analysis of sexual habits.


J. Counsel. Psychol., 6, 55-60.

B.M.J., 1, 211-213.

P. Sainsbury & N. Kreitman, "Methods of psychiatric research." Oxford University Press.

McGraw Hill.

Fraser, M. S. (1971) Reasons for failure in buzzer training.
Paper presented at colloquium on recent advances in
knowledge of bladder control in children, Newcastle-upon-Tyne.

Fraser, M. S. (1972) Nocturnal enuresis.
Practitioner, 208, 203-211.

Freyman, R. (1963) Follow-up study of enuresis treated with a bell apparatus,

B.M.J., 2, 91-94.

B.M.J., 1, 495-496.

Garfield, S. L., & Affleck, D. C. (1959) An appraisal of
duration of stay in outpatient psychotherapy.

psychotherapy.

Gelber, H., & Meyer, B. (1965) Behaviour therapy and encopresis :
complexities involved in treatment.
Behav. Res. & Therapy, 2, 227-231.

Gelfand, D. M., & Hartmann, D. P. (1968) Behaviour therapy with
children : a review and evaluation of research methodology.

Geppert, T. V. (1953) Management of nocturnal enuresis by
conditioned response.

Gerard, M. W. (1937) Child analysis as a technique in the
investigation of mental mechanisms : illustrated by a study
of enuresis.


Gill, S. E. (1940) Nocturnal enuresis : experiences with evacuated
children.
B.M.J., 2, 199-200.

Gillison, T. H. (1963) Enuresis. Correspondence,
B.M.J., 2, 1200.

enuresis by the electric alarm.
B.M.J., 2, 1268-1272.

Glicklich, L. B. (1951) An historical account of enuresis.
Pediatrics, 8, 859-876.

Glidewell, J. C. Mensh, I. N., & Gildea, M. C. L. (1957) Behaviour
symptoms in children and degree of sickness.
Am. J. Psychiat, 114, 47-53.

Gluck, M. R., et al. (1964) Follow-up evaluation of 55 child
guidance cases.
Behav. Res. & Therapy, 2, 131-134.


Leading article (1964) Lancet, 1, 1425-1426.


Behav. Res. & Therapy, 9, 187-195.


Lovibond, S. H. (1963a) Intermittent reinforcement and behaviour therapy. 
Behav. Res. & Therapy, 1, 127-132.

Behav. Res. & Therapy, 1, 17-21.

Pergamon Press.

Behav. Res. & Therapy, 10, 287-289.

New York, John Wiley.

Luborsky, L. et al. (1971) Factors influencing the outcome of psychotherapy: a review of quantitative research. 


Behav. Res. & Therapy, 4, 187-196.

MacKeith, R. C. (1964) Micturition induced by giggling. 


MacKeith, R. C. (1972) Is maturation delay a frequent factor in the origins of primary nocturnal enuresis? 

MacLean, R. E. G. (1960) Imipramine hydrochloride (Tofranil) and enuresis. 
Am. J. Psychiat., 117, 551.

Psychol. Rev., 64, 276-287.


McGraw Hill.

Slow Learning Child, 19, 53-59.

Simon, C. W., & Emmons, W. H. (1956) Responses to material presented during various levels of sleep.
J. Exp. Psychol., 51, 89-97.

Diss. Abs. Int., 30 (II-B), 5244.

Chicago, Aldine.


Academic Press.


George, Allen & Unwin.


J. Pediat., 70, 777-781.


J. Sch. Psychol., 8, 145-151.


"Success and failure in the conditioning treatment of childhood enuresis"

Problems occurring in the treatment of childhood enuresis were investigated at a behaviourally oriented special investigation clinic in north London. Four major problems were identified; non-attendance for the commencement of treatment, the termination of treatment through patient withdrawal, slow response to treatment and relapse. A wide range of patient, background and treatment variables were investigated, and measures of relevant patient and parental expectancies and attitudes (including child concern and parental intolerance) were developed.

Non-attenders were found to be characterized by a low proportion of referrals from general practitioners, a high proportion of referrals from health visitors and a longer period spent on the waiting list for treatment. A 9.7 per cent waiting list remission rate is reported, and non-attenders were found to be less severely enuretic than attenders following the waiting period.

A termination rate of 31.6 per cent of patients entering treatment is reported. Terminators were found to have progressed poorly in treatment, termination being associated with poor cooperation and appointment failure. A positive family history of enuresis, a low child prognostic expectancy and high maternal intolerance of the enuretic child were associated with termination. Termination occurred most slowly in four-child families, and the first ten appointments were identified as a "failure zone".

Failure to awaken to an auditory enuresis alarm stimulus was associated with both termination and slow therapeutic response. Slow response was also associated with maternal anxiety and a history of familial disruption. The patients' CAMAS and JASPI scores were not found to be associated with therapeutic response.

None of 38 patient, background and treatment variables were found to be associated with relapse, although older children tended to relapse more rapidly. The procedure of overlearning by increased fluid intake in conjunction with an enuresis alarm was evaluated, and was found to be strongly associated with a lower relapse rate.