DEVELOPMENT OF AN 'INDIVIDUALISED SENSORY ENVIRONMENT' FOR ADULTS WITH LEARNING DISABILITIES AND AN EVALUATION OF ITS EFFECTS ON THEIR INTERACTIVE BEHAVIOURS

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Appendices

CHAPTER 7: DISCUSSION OF RESULTS

7.1 Introduction to Chapter

This chapter is about the results of the empirical phase of the project. It is divided into two main parts. The first part discusses the results of the main study in relation to each of the experimental hypotheses and to the relevant literature. It reviews the potential routes of therapeutic effect and suggests reasons for the measured changes to engagement levels. The previously cited theories in **Chapter 2**, i.e. Sensory Integration Theory and the role of sensory reinforcement, are critically reviewed in this context, together with the established theoretical framework for the 'Individualised Sensory Environment' **(I.S.E.)**. The second part reviews the original aims of the study and discusses how far their objectives have been achieved.

7.2 Structure of Discussion

The discussion of the results is structured according to the experimental hypotheses which are presented in stages. The relevant points are discussed at the stage considered to be most appropriate, although the themes raised may relate to more than one hypothesis. The results are discussed in relation to the reported research findings of two main intervention procedures cited in the literature review of **Chapter 2:** Sensory Integration techniques; and sensory reinforcement and reactivity. Due to the unique nature of the intervention **(I.S.E.)** used in the current study, the limited relevance of the literature is pointed out. The issue of group as a factor in the interpretation of the results will also be examined.

The relevance of the theoretical areas cited in the literature review, i.e. Sensory Integration and neural processing; sensory reinforcement and environmental contingencies; and significant other behaviour, are discussed in relation to the findings of the current study. The results are related to the established theoretical framework of **I.S.E.** intervention and the routes of potential therapeutic effect.

7.2.1 Hypothesis One: Effects of Interventions Over Time

Hypothesis 1: There will be a significant improvement in the dependent variables over the four assessment points, including baseline and after each of the three subsequent phases of intervention.

The reader is introduced to the key questions to be addressed in the subsequent stages of the discussion where there will be more specific exploration of: (i) the relationship between the type and direction of change, and the interventions; and (ii) the route of therapeutic effect and the reasons.

1. Introduction to Results

Analysis of variance was carried out on the data within each experimental group and over the first four assessment points, including baseline and after each of the three subsequent phases of intervention. This was to determine if significant changes in engagement levels had occurred over the assessment points.

Experimental Group 1:

Analysis within Group 1 revealed significant changes in the level of the dependent variables, i.e. engagements. Follow-up data were excluded from this stage of the analysis. Inspection of the simple main effects showed significant changes to the levels of *self-active*, *person* and *object* engagements. Changes to the levels of *self-neutral* and *person-object* engagements were not significant.

Experimental Group 2:

Analysis within **Group 2** also showed significant changes to the dependent variable, i.e. engagement levels. The simple main effects revealed changes to the levels of *self-active*, *person* and *object* with non-significant changes to the levels of *self-neutral* and *person-object* engagements.

These are important results because they show that variations in the measures across assessment points exist within each experimental group. The simple main effects reveal

significance levels for identical types of engagement. That is, the results for both experimental groups over the first four assessments are similarly significant.

2. Interpretation of Results

This section outlines the specific questions for address in the discussion of the results in relation to each hypothesis. This is to introduce the reader to the structure of the discussion. Two questions have been identified: **(2.1)** What is the relationship between the type and direction of changes that have occurred to the two levels of the independent variable within each group [**Intervention A**: Individualised Sensory Environment' **(I.S.E.)**; and **Intervention B**: Attention Placebo **(A.P.)**]?; and **(2.2)** What has effected the changes to engagement levels and by which route has the therapeutic effect taken place? A key question that relates to each of the previous two is: *How do the changes in **Group 1** compare with those in **Group 2**?* This is so that any variations between the two groups may be considered. The first question **(2.1)** will be addressed over subsequent stages of the discussion, where the changeover points in consecutive interventions are examined. In order to address the second question **(2.2)**, the reader is given an outline of the potential routes of therapeutic effect. This provides the structure for the discussion in relation to the experimental hypotheses.

Three main routes of therapeutic effect are provided for address at each stage of the discussion: **a)** The **direct** route where change in participant engagement levels is a result of the **I.S.E.** intervention; **b)** The **indirect route**, where change in participant engagement levels has been brought about either by environmental contingencies or else by a change in the attitudes and overt communication behaviours of the significant others; **c)** The interaction of both the **direct** and **indirect** therapy routes. An outline of each route is now provided for the reader.

a) Direct Route of Therapeutic Effect (A to C):

Question: Are the changes in participant engagement a **direct** result of the **I.S.E.** intervention? The direct route is illustrated in the figure over the page.

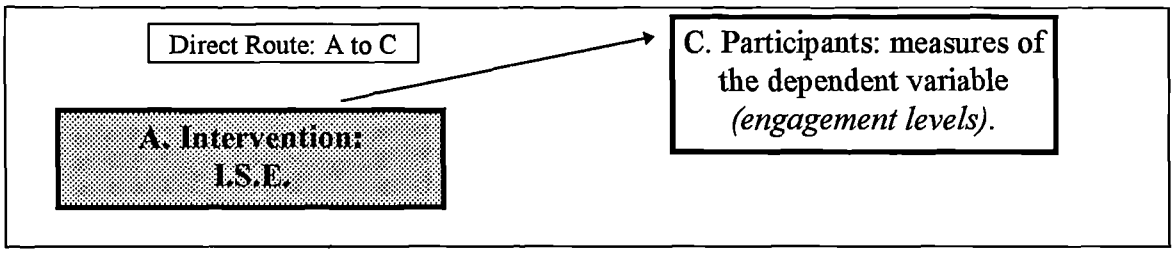

Figure 7.2.1.1: The Direct Route of Therapeutic Effect

The direct route assumes that the intervention is directly responsible for the changes observed in a participant. This is a route that has been supported, although not entirely, by the early Sensory Integration Theorists (Ayres, 1972; 1978). More latterly, some consideration has been given to the role of the environment within the therapeutic process (Fisher, Murray and Bundy, 1991). However, 'sensory integration' focuses primarily on the neurological process of change within the individual. In the context of sensory reinforcement, the direct route is defined as the establishment of participant amenability to environmental contingencies that are available.

b) Indirect Route (A to B to C):

Question: Are these changes in participant behaviour due to a more **indirect**, environmental effect through a change in the attitudes and overt communication behaviours of the significant others to their clients? The indirect route is illustrated in the figure below.

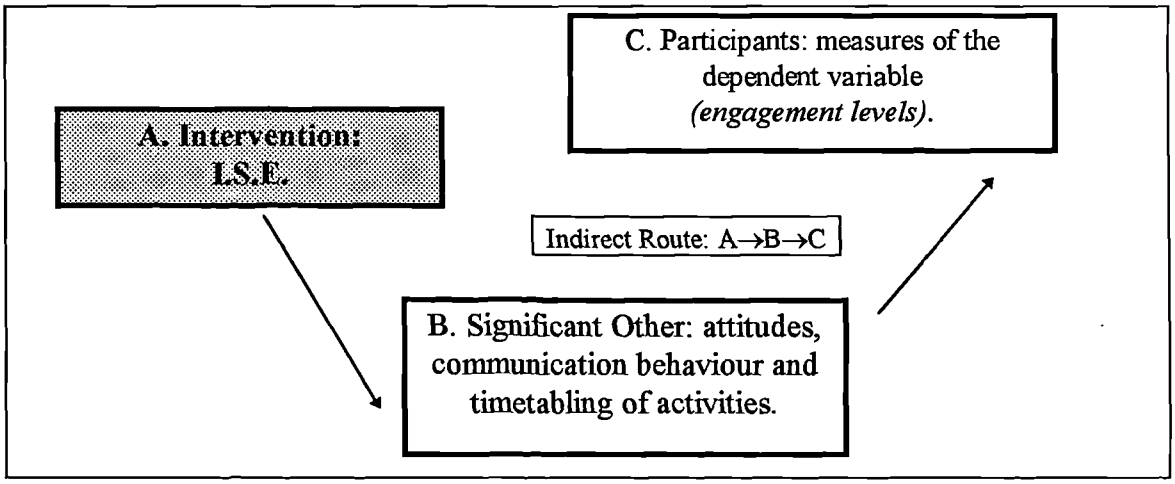

Figure 7.2.1.2: The Indirect Route of Therapeutic Effect

The indirect route considers the role of the significant other and the presence of environmental contingencies. It focuses on the changes to the communicative role of the significant other as a result of their involvement in the delivery of therapy. The role of 'Individual Helper' was carried out by the significant others, under the guidance of the Speech and Language Therapist. This role is outlined in the operational document in **Appendix A2.** Effectively, this meant that the significant others were apprenticed to the lead therapist who provided new opportunities for participant interactions where sensory stimulation was a key reinforcer. There was also the demonstration of a communicative role in relation to the participant, that incorporated a minimal core vocabulary and the presentation of activities within a response-contingency framework. In short, significant others learned new skills in relation to their communication partnerships with the participants.

As well as influencing the communicative role of the significant other in terms of the quantity and quality of their interactions with the participant, the indirect route may have influenced the environmental contingencies provided. That is, the significant others subsequently exerted their influence over the environment regarding the presence of contingent stimuli, by the purchase of new therapy equipment and the timetabling of sensory-based activities. Other researchers have stressed the importance of the environment to the behaviour of learning disabled adults. Changes in environment have been observed, not only to improve quality of life for learning disabled adults, but to significantly effect improvements in constructive engagements and declines in inappropriate behaviour (McHatton, Collins and Brooks, 1988). Larson and Lakin (1989) reported on statistically significant improvements to adaptive behaviour of institutionalised adults moving to community facilities.

Related to this, are the more general environmental effects that were observed by the researcher to take place, and although the evidence is largely anecdotal, gathered from the researcher's informal observations, it is considered pertinent to the discussion. For instance, 'favourite objects' of clients were gathered together and made accessible within team bases; alterations to timetabled activities occurred which reflected a more general interest in sensory based activities, such as 'aromatherapy'. It would seem that the project generated new ideas for educational sessions within the Day Centre. This may be

attributable to the new and different styles of interaction experienced by staff with their clients in the **I.S.E.** intervention, rather than their more usual verbal exchanges.

c) Interaction of the Direct and Indirect Routes (A to C and A to B to C):

Question: Are the changes in participant engagement due to an interaction of both the **direct** and **indirect** therapy routes? The interaction of these routes is illustrated in the figure below.

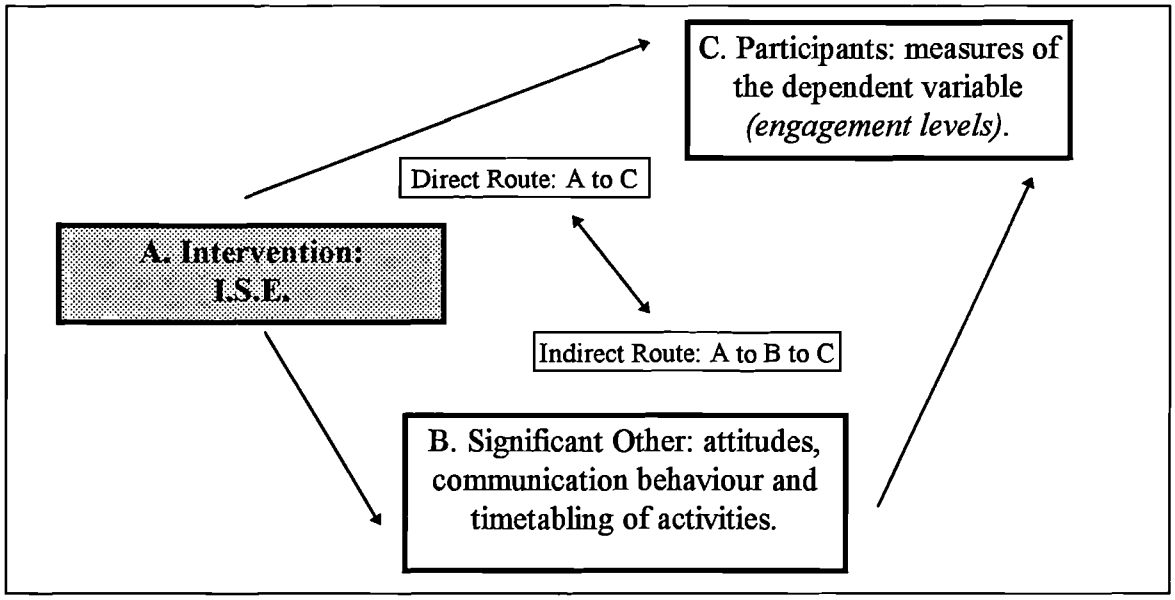

Figure 7.2.1.3: Interaction of the Direct and Indirect Routes of Therapeutic Effect

Naturally, if each of the **direct** and **indirect** routes of therapeutic effect are given separate consideration, the potential of their interaction must also be examined. Do the two routes mutually influence each other, such that the improved engagement levels of the participant effect the appropriate communication behaviours of the significant other, and vice versa? In order to address this question, the discussion will focus on both the synchronic and diachronic effects of therapy with reference to the 'Model of Sensory Integration Effectiveness' (Tickle, 1988). In short, what therapeutic effects take place within a therapy session (i.e. the synchronic model), and what therapeutic effects take place over time (i.e. the diachronic model).

3. Group as a Factor

The two experimental groups were composed by the random assignment of therapy groups of similar membership number. The therapy groups were formed on the basis of

the participant's Staff Team within the Day Centre, and the Staff Team was defined by the participant's residential location within the focal borough. Although all participants fulfilled the candidacy criteria outlined in the initial Referral Form, there were variations in engagement levels at baseline assessments between the two experimental groups. These differences will be more specifically addressed under **'Hypothesis 2'** which looks at engagement levels within groups at baseline assessment.

4. Summary for Hypothesis One

The data have provided support for the first hypothesis. Significant change has been shown to occur within each group over the intervention period. The types of engagement that have been significantly affected were the same for both groups, i.e. *self-active*, *person* and *object* engagements. Just why these particular engagements should be amenable to the effects of therapy will be addressed at later stages of the discussion.

Although significant effect has been shown to occur within each group over the intervention period, variations between the consecutive measurements appear to have occurred. This requires the specific examination of change before and after each episode of intervention within both groups, in order to determine the direction and extent of change over the intervention period.

In order to provide a full interpretation of the issues raised in relation to the results, the statistical analysis has been carried out over a number of stages to support individual hypotheses. The issues are: **2.1** The relationship between the type and direction of change and the two levels of the independent variable [**Intervention A**: Individualised Sensory Environment' **(I.S.E.)**; and **Intervention B**: Attention Placebo **(A.P.)**]; and **2.2** The explanation for changes in engagement levels and their relationship to the potential route of therapeutic effect.

7.2.2 Hypothesis Two: High Levels of Non-Purposeful Engagement

Hypothesis 2: There will be higher levels of non-purposeful behaviour (i.e. ***self-active*** and ***self-neutral***) than purposeful behaviour (i.e. ***person***, ***object*** and ***person-object***).

1. Introduction to Results

At baseline, both experimental groups displayed much higher levels of non-purposeful behaviour (*self-active* and *self-neutral*) than purposeful (*person, object* and *person-object*).

(i) Experimental Group 1:

The level of *self-active* engagement was more than double that of *self-neutral* in **Group 1.** Both categories of non-purposeful engagement were much higher than the levels of purposeful engagement (*person, object* and *person-object*).

(ii) Experimental Group 2:

The level of *self-neutral* engagement was more than double that of *self-active* in **Group 2.** This was the opposite of the baseline results of **Group 1**. Both categories of non-purposeful engagement were much higher than the levels of purposeful engagement (*person, object* and *person-object*).

2. Interpretation of Results

Discussion of baseline levels of engagement focuses on the potential factors of influence. Three main areas have been identified: **(i)** Skill Set and Learning Disability; **(ii)** Environment; **(iii)** Additional Sensory and Motor Impairments. The theoretical position of Sensory Integration is reviewed specifically in relation to the first area **(i)**.

(i) Skill Set and Learning Disability:

The interaction of the learning disability and functional skill set of the sample population is a likely factor influencing the high levels of non-purposeful activity. The participants of the current study were described in the **definition phase** of the project. Although the degree of learning disability was not identified precisely, a functional review of their skill sets revealed high levels of dependence. They had also fulfilled the candidacy criteria which related to the parameters of intentional communication and purposeful activity. In short, the sample comprised learning disabled adults who were not yet intentionally communicating and who were dependent on others to supply their needs. Their skill set use demonstrated little functional independence.

The high levels of non-purposeful engagement at baseline are consistent with the findings of a number of studies. Storey et al (1984) observed that self-stimulatory behaviour, defined as stereotypic and repetitive, was prevalent amongst the developmentally delayed population. Repp et al (1988) concluded in a review of documented surveys that stereotypic and self-injurious behaviours were indeed common forms of maladaptive responding amongst severely handicapped persons. Griffin et al (1986) reported on a much higher proportion of people with a severe-profound learning disability amongst those identified as being self-injurious, compared with those with mild-moderate disabilities, in a state wide survey of institutionalised adults. The current study has incorporated 'self-injurious' and 'stereotypic' behaviours within the engagement category *'self-active'*. Walsh (1994) found a prevalence rate for stereotypy of 57% in a survey of a residential complex (112 adults with learning disabilities) in West Ireland. He also found that the increased level of learning disability seemed to be associated with the presence of multiple stereotypies.

Other studies have explored the relationship between communication skills and engagement levels. In a study to investigate the relationship between communication ability and problem behaviours, Chamberlain et al (1993), found that those with the least functional communication skill sets, showed the most challenging behaviour, revealing correlations between their communication difficulties and behavioural problems. They concluded that the more able clients, having the skills to verbalise their feelings and internal judgements in a common code of reference with their staff, experienced comparatively reduced problem behaviour. The participants of the present study, lacking a communication skill set to intend effect over their environment, could be said to experience similar disability and isolation from environmental events. Unable to inform others of activity choice, or to send or respond to verbal communications, they demonstrated a limited ability to initiate purposeful engagements with *person*, *object* and *person-object*.

Does Sensory Integration Theory provide an adequate explanation for the high levels of non-purposeful behaviour?

The results of this level of analysis are not adequately explained by Sensory Integration Theory. The theoretical framework of Sensory Integration focuses on the internal ability of the individual to process incoming sensory information. This is referred to as a

'sensory integration deficit' (Ayres, 1972). The possibility of an 'environmental failure' effecting a lack of stimulation is not considered by the Sensory Integration Theorists (Arendt et al, 1988a). It is here that the major contradiction in this theory is seen. Proponents of Sensory Integration Therapy assume that the sensory integration deficit, acknowledged to be an internal C.N.S. processing/organisation problem, can be corrected by the provision of external or environmental, supplemental stimulation. Sensory Integration Theory not only fails to acknowledge the role of the environment in its diagnosis of the central deficit, but it then proceeds to provide intervention by the organisation of external variables, i.e. sensory stimulation. Hence, the rationale of Sensory Integration Therapy appears to be inconsistent.

Just how far the theoretical framework of Sensory Integration is applicable to people with learning disabilities must be put into question. Ayres (1979) did comment that this population do not have a sensory processing problem so severe as to cause the learning disability. However, a review of the literature revealed a number of studies that reported the use of Sensory Integration Therapy with the learning disabled (Bonadonna, 1981; Storey et al, 1984; Sandler and McLain, 1987; Brockle-Hurst Woods, 1990; Dave, 1992) amongst others. This raises the uncertainty regarding the precise relevance of Sensory Integration research to the current study. The controversy surrounding Sensory Integration Theory is debated in relevance to the appropriate stages of the discussion.

The literature has tended to focus specifically on *'maladaptive'* behaviour rather than *'neutral'* behaviour, both of which have been included within the definition of *'non-purposeful'* behaviour in this study. The prevalence of *'neutral'* behaviour has been reported on, in relation to institutional populations. Others have identified the degree of learning disability to be an important factor. Zigler et al (1986) concluded that lower levels of social responsiveness were related to the degree of learning disability. The appropriateness of task demands regarding the skill set of individuals and the availability of environmental contingencies may also be factors in the level of *self-neutral* behaviour.

The degree of learning disability and the functional skill sets of the participants in the present study, are considered to be factors in the high levels of non-purposeful behaviour found in both Experimental Groups at baseline assessment. However, these factors need to be viewed in the context of the environment and the quality of social interaction

opportunities provided by the staff. McLeod et al (1995), in their study of the effects of training on experienced and naive carers, concluded that experience alone did not 'teach' people good practice. The current study involved an 'experienced' staff team who had not received any formal training on social interaction and communication strategies for use with the sample population. Furthermore, the participants were considered to be the most communicatively challenging to the staff because of a lack of responding behaviour. The role and behaviour of the staff members, both in terms of quantity and quality of interactions, must be considered potentially relevant factors in the influence of the environment over the situation at baseline assessment.

(ii) Environment:

The participants of both groups were regular attendees of the same Day Centre. They were therefore exposed to the same general environment. The Staff Team bases of the therapy groups varied, i.e. **Group 1** comprised participants from staff teams A and B; **Group 2** comprised participants from staff teams A, C and D. Both groups had participants from Team A. However, in such a small study sample where differences in staff team existed, there may also have been variations in team environment regarding the communication behaviours of staff to clients and the creation of interaction opportunities. These were outside the control of the current study. The timetabling of activities within each team was similar according to the Day Centre's curriculum at that time.

Whilst acknowledging that variations between staff teams may have been an influential factor over participant engagement levels, the importance of both contingent and non-contingent stimulation is stressed. The level of environmental stimulation, both in terms of quantity and quality, in relation to surroundings, activity and interaction opportunities is important. A lack of stimulation may negatively influence levels of purposeful activity and may even effect a rise in non-purposeful behaviour. This is consistent with the view of Presland (1991) who suggested that a *'lack of materials and activities of interest'* may lead to the emergence of stereotypies as a *'way of passing the time'* (p. 67).

The findings of the current study relate to surveys of institutional populations where deprivation and a lack of stimulation have been highlighted as critical factors (Grant and Moores, 1976; Felce et al, 1980; Jones et al, 1984). Mansell at al (1982) commented on

the low levels of purposeful activity in facilities for persons with severe and profound learning disabilities.

It is acknowledged that the environment has a role to play regarding the engagement levels of learning disabled people and a lack of stimulation may lead to depressed levels of purposeful activity. The television reports from Romania at the end of the 1980's showed children in institutions displaying classic examples of stereotyped behaviour. However, the **presence** of stimuli may not be sufficient to affect the levels of non-purposeful behaviour. Jones et al (1995) cite a study by Dehaven, Rees-Thomas and Benton (1980), where little difference was shown in the high levels of stereotypy emitted by participants who were moved from institutional units to rooms with toys and minimal social interaction. Therefore, the indiscriminate presence of stimuli had no effect on the levels of stereotypy. The contingency of the stimulation and the type of reinforcement offered may be the significant factors. This will be discussed further in the next section which examines the effects of the intervention on the level of non-purposeful engagement.

The role or actual presence of the significant others may be important. Favell (1973) found that engagement levels were positively effected by presence of the experimenter who handed the participants toys. The current study was conducted in a Day Centre where the recommended staff to client ratio was one member of staff for every eight learning disabled adults. In reality, this was reduced by staff sickness, annual leave and temporary vacancies. Therefore, the provision of social interaction opportunities is likely to have been negatively effected by a lack of available staff, which in turn, may have influenced the level of non-purposeful behaviour at baseline assessment.

The relationship between the environment and *'maladaptive'* behaviour has been well documented in the literature (Presland, 1991). The other area of interest in the *non-purposeful* behaviour parameter of the current study was *'neutral'*. The high levels seen in **Group 2** at baseline assessment and less so, in **Group 1**, are consistent with the findings of some researchers. McHatton et al (1988) assessed a group of learning disabled adults prior to their move to a community residence. They found that 70% of mean time was spent in *neutral* engagement prior to their community move, when it increased. Therefore a relationship between the setting and the behaviour is suggested.

Bratt and Johnson (1988) observed changes in the engagements of young adults with profound handicaps following discharge from hospital care into a "second generation" housing project. Re-assessment of the residents in their new home revealed reductions in non-purposeful behaviour. However, it is unlikely that changes in engagement levels were solely due to the new, smaller community-based environment. The importance of social, educational and employment opportunities that may have been additionally provided as a result of a move to the community, should not be underestimated (Jones et al, 1995). The conclusion is that high levels of *neutral* behaviour are associated with limited environmental stimulation and a lack of social, educational and employment opportunities.

The characteristics of the environment, in terms of the presence of contingent and non-contingent stimuli, together with the quantity and quality of available social interaction opportunities provided by staff, are considered to be important factors associated with the high levels of non-purposeful behaviour at baseline assessment in the current study.

(iii) Additional Sensory and Motor Impairments:

The high incidence of additional sensory and motor impairments amongst the learning disabled has already mentioned (Dupont, 1981; Gustavson, 1981). The relationship between an increased level of learning disability and a higher incidence of additional impairments has also been reported (Dupont, 1981). Therefore, its significance to the baseline measures of the current study is acknowledged. Furthermore, the relationship between non-purposeful behaviour, in particular *maladaptive* engagement, and the presence of additional sensory impairments has been described by a number of researchers (Stainback and Stainback, 1980; Mulick and Rojahn, 1980; Eyman and Call, 1977; Ross, 1972). More specifically, Jones at al (1995) cite studies that relate stereotypic behaviours to individual types of impairment: eye pressing and light gazing in children with visual impairments (Jan et al, 1983); and multiple stereotypies including self-injury, tongue chewing, hand flapping and putting fingers in mouth, in deaf-blind children (Myrbakk, 1991; Aurand et al, 1989) amongst others.

The results at baseline indicate that the factor of additional sensory and motor impairments is more critical for **Group 1** with its higher prevalence. However, the missing assessment data for both groups means this is not conclusive. In **Group 1**, three

participants had hearing losses, two of the losses being greater than 60 decibels, compared with only one participant in **Group 2**. Interestingly, in **Group 1**, out of the four participants who emitted the highest levels of *self-active* behaviour at baseline, three had hearing losses. This suggests that the presence of a hearing loss may be a factor in the type of non-purposeful behaviour, i.e. *self-active*, and in relation to its level of emission (Presland, 1991).

3. Group as a Factor

Firstly, although the mean data for both groups at baseline assessment revealed high levels of non-purposeful behaviour, there were clear differences in the separate engagement levels of this parameter, i.e. *self-active* and *self-neutral.* **Group 1** displayed a higher level of *self-active* behaviour than **Group 2,** where the level of *self-neutral* was greater. This means that any direct comparisons between the two groups regarding the effects of intervention will need to take into account these differences. Are the differing engagement levels in each group similarly amenable to change? Does a different relationship exist between each experimental group and the levels of the independent variable: **'Intervention A' (I.S.E.)** and **Intervention B' (A.P.)**? The issue is merely pointed out to the reader at this stage. It will be addressed in the context of the interventions later on.

It is possible that variations in data across the experimental groups may partly be explained by the presence of one or two individual participants in **Group 2**, who exhibited minimal levels of *self-active* engagement and high *self-neutral* levels. However, comparison of all participants reveals that the higher levels of *self-active* engagement were shown by those in **Group 1**.

A second factor must be taken into consideration: the presence of additional sensory and motor impairments within each group. There was a higher incidence of additional sensory and motor impairments in **Group 1** compared with **Group 2**. Although unplanned, this may have a been an important factor regarding engagement levels at baseline. **Group 1** participants exhibited higher levels of *self-active* behaviour. This was more than double the level recorded for **Group 2**. **Group 2** participants displayed a level of *self-neutral* behaviour that was more than double the level of **Group 1**.

The prevalence of additional sensory impairments is generally known to be higher amongst the more severely learning disabled population (Dupont, 1981; Kropka et al, 1984; Yeates, 1992 a & b). Furthermore, a lack of reliable assessment data may lead to a deficiency in essential personal and environmental adaptations, which may in turn further negatively influence engagement levels.

Nevertheless, and for whatever reason, it is clear that the learning disabled participants of both groups do indeed engage in much higher levels of non-purposeful engagements than purposeful interactions.

4. Summary of Hypothesis Two

Overall, the data are in support of the second hypothesis. The levels of *self-active* and *self-neutral* behaviour are much higher than the engagement levels of *person, object* and *person-object* interactions at baseline assessment. Variations have been shown to exist between the two experimental groups regarding the type of non-purposeful behaviour that was emitted at baseline assessment: **Group 1** showed higher levels of *self-active* (maladaptive); **Group 2** showed higher levels of *self-neutral* behaviour..

The literature has suggested a correlation between stereotypy and certain factors that may apply to the current study. The **first factor** is the degree of learning disability and the functional independence of the participant's skill set. This may have a bearing on the ability of the individual to engage in purposeful activities. This is consistent with the characteristics of the sample population in the current study. They have been described as having limited communication skills and restricted functional independence. Obviously the degree of learning disability and skill set of participants must be related to the types of opportunities that are provided in the environment and their appropriateness to the individual's skills. The **second factor** is a lack of contingent and non-contingent environmental stimulation or even general deprivation as observed in the studies of institutionalisation. The role of significant others regarding the quantity and quality of their social interactions with participants is also considered in the environmental context. The **third factor** is the presence of additional sensory and motor impairments. Although inconclusive, the findings of the current study suggest a possible link between hearing impairment and *self-active* behaviour (i.e. maladaptive).

The explanation for higher levels of non-purposeful behaviour than purposeful lies with an interaction of at least three possible factors of influence: (i) skill set and learning disability; (ii) environment; and (iii) additional sensory or motor impairment. A two way interaction of environment and learning disability is likely for both groups. The three way interaction including additional sensory and motor impairment is more directly applicable to **Group 1**, where a high prevalence has been identified.

If the construct 'non-purposeful behaviour' is observed according to its dual definitions of *self-active* and *self-neutral* engagement, then it is true that learning disabled adults who are not yet intentional communicators, do engage in high levels of this behaviour, as compared with minimal levels of *person*, *object* and *person-object* engagements.

7.2.3 Hypothesis Three: Decrease in Non-Purposeful Engagement

Hypothesis 3: The introduction of the **I.S.E. (Intervention A)** will effect a reduction in the level of non-purposeful behaviour (i.e. ***self-active*** and ***self-neutral***).

1. Introduction to Results

Changes to the engagement levels after the first intervention were significant for both Experimental Groups.

(i) Experimental Group 1:

The introduction of first intervention **(A: I.S.E.)** effected a significant decline in the level of *self-active* engagement.

(ii) Experimental Group 2:

Similar to **Group 1**, there was a significant reduction in the level of *self-active* engagement after the first phase of intervention **(B: A.P.)**

2. Interpretation of Results

2.1 Relationship Between the Type and Direction of Change, and the Intervention

Both interventions (**A: I.S.E.** and **B: A.P.**) have effected initial reductions in the levels of *self-active* behaviour. The extra attention provided by the placebo condition has had a similar effect to that of the **'Individualised Sensory Environment'**, therefore the type of intervention does not seem to be significant to the effects on non-purposeful behaviour.

It was hypothesised that the level of *self-neutral* would have shown a reduction similar to that of *self-active* engagement. In particular, one might have expected that the higher level of *self-neutral* at baseline assessment within **Group 2,** would have rendered it more amenable to change, i.e. there is greater space for therapeutic effect. However, from this set of results, it appears that the type of non-purposeful engagement is a critical factor of the change. In this case, it was *self-active* that was amenable to the effects of both the interventions and decreased its baseline level. However, if one examines the changes between assessments (2) and (3) within **Group 2**, after their first **I.S.E.** intervention, a significant decline in *self-neutral* engagement is revealed. It could be interpreted that the extra attention provided by the placebo condition (**A.P.**), whilst adequate to effect a reduction in *self-active* behaviour, was insufficient to influence a decline in the level of *self-neutral.* The **I.S.E.** intervention, however, delivered as the second intervention episode to **Group 2**, did effect the reduction of *self-neutral* engagement.

A number of reasons for the decline of *self-active* engagement in response to both interventions are suggested, and for the placebo's lack of effect on the level of *self-neutral.* **Firstly**, if stereotypic behaviour is associated with the degree of available environmental stimulation as suggested by Barton and Broughton (1980) in their review of the literature, then it follows that manipulation of one, e.g. the environment, should affect the other, e.g. the level of *self-active* behaviour. This is consistent with separate studies by Murphy et al (1986) and O'Brien (1980) where an increase in environmental stimulation effected reductions in stereotypies. **Secondly**, that *self-neutral* behaviour is not so immediately reactive to the effects of the extra attention provided by both interventions because it is not a function of low environmental stimulation.

Thirdly, that the high levels of *self-neutral* behaviour are due to other reasons, e.g. inappropriate task demands and a lack of facilitation skills by the staff members, such that the participant remains neutral to a task that demands responses beyond the individual's skill set. Burke (1991) commented that the level of stimulus complexity was important to the stage of development and skills of the child. If this is the case, it serves to explain the amenability of *self-neutral* engagement to the more accessible activities of the **I.S.E.** intervention at a later stage. An alternative explanation might be that its reduction after a later episode of therapy, is attributable to the staff members who had acquired the confident use of facilitation strategies in task presentation to their clients. This will be explored at a later stage of the discussion.

2.2 Route of Therapeutic Effect and Reason for Change

(a) Direct Route of Therapeutic Effect [Intervention to Participant (A to C)]:

These findings are consistent with interventions using sensory stimulation, and those where extra attention has been provided. Both will be considered in relation to the findings of the current study.

(i) Sensory Integration Therapy and Sensory Awareness Training:

The current study involved an original intervention where sensory stimulation was dependent on the participant producing target responses. This is not necessarily the case for some of the studies cited in relation to the results at this stage of the analysis. However, their use of sensory stimulation as a key artefact in the therapy procedure and their reported reductions in specific examples of *self-active* behaviour, make them relevant to the discussion. The studies cited have focused on sensory stimulation procedures (i.e. Sensory Integration procedures and sensory awareness training); the role of sensory reinforcement and the reactivity of stimuli (i.e. environmental contingencies). The limited relevance of the cited studies is summarised at the end of this section, thereby providing direction for the **I.S.E.** intervention.

Researchers who have employed sensory based techniques to reduce stereotypic behaviour have reported mixed results. Storey et al (1984) employed sensory awareness training to effect a reduction in self-stimulatory behaviours of a profoundly learning disabled female. They reported its general decline although it was not statistically

significant. They compared the effects of the sensory awareness training with the engagement levels recorded in the baseline period. A placebo condition was not used, therefore the extra attention provided by the intervention was not neutralised and the reason for the reduced self-stimulation remains unclear. Arnold et al (1985), found a significant reduction in the level of hyperactivity in children with attention problems, as a result of vestibular stimulation. Reduction in the self-stimulatory behaviour of autistic adolescents with severe learning disabilities, has been suggested as a result of sensory integrative procedures by Ayres and Mailloux (1983), although levels of significance were not reported.

Dura et al (1988) found reductions in the self-injurious and stereotypic behaviour of a single case, but no significant difference was observed between the effects of the intervention (vestibular input) and an attentional control condition. Mason and Iwata (1990) reported the various reactions of three participants to sensory stimulation, compared with successful responses to behavioural interventions, that resulted in a reduced self-injury. Dave (1992) also documented mixed responses amongst her three participants to the application of linear vestibular stimulation suggesting that the criteria for participant candidacy and a lengthier treatment period were issues for consideration in any further research.

Brocklehurst-Woods (1990) reported statistically significant treatment effects in single case studies of two learning disabled adults. Vestibular stimulation was applied in a therapy regime together with tactile stimulation for the reduction of stereotypic behaviours. Selected behaviours were observed although their rates were reportedly 'variable'. The split middle method to determine a celeration line from the baseline data and extended into the treatment phase was used (Ottenbacher, 1986), although the results were not felt to be clinically significant because of the *'variability of these behaviours'* (Brocklehurst-Woods, 1990)(p.540).

The findings of the current study, are strengthened by the use of a placebo condition within an alternating treatments design. This has served to control for the effects of extra attention over engagement levels. This has not been the case for the majority of studies that have investigated the effects of sensory stimulation. The relationship of the current study's findings to the research of those cited is limited by certain differences. The

current study, as well as alternating the **I.S.E.** intervention with an attention placebo condition, also used: assessment methods that were independent of the actual therapy session; reliability of measures; and an operationally defined intervention **(I.S.E.)** that invoked the use of a response-contingency procedure.

(ii) Sensory Reinforcement and Reactivity:

The use of sensory reinforcement within behaviour modification programmes has been reported to effect similar reductions in stereotypy and self-injury (included in the *self-active* classification of the current study). Jones et al (1988) applied vibrations to a learning disabled person to reinforce time not spent emitting the undesirable behaviours. A significant decline was reported.

The degree of sensory reactivity of present items has also been reported to effect reduced levels of stereotypy. Smith, Iwata and Shore (1995) cited a number of studies which investigated the reinforcing effects of stimuli on maladaptive behaviour and adaptive skills development. By presenting learning disabled children with specially adapted toys which provided potent stimuli in response to the participant's manipulations, Murphy et al (1986) were able to observe them emit fewer stereotypies. Others have reported mixed results. Steege et al (1989), reported reductions in the frequency of problem behaviour amongst severely learning disabled children, which they attributed to the presentation of stimuli acknowledged to have reinforcing consequences for the individual participants.

Is the choice of reinforcer a factor?

The choice of reinforcer may be a factor. Mason, McGee, Farmer-Dougan and Risley (1989) reported a reduction in maladaptive behaviour when observing on-task performance under two separate conditions: teacher selected reinforcing stimuli; participant selected reinforcing stimuli, Although the greater effect was observed in the second condition, it may have been a consequence of the experimental procedure, i.e. the superior assessment procedure of the second condition, whereby a reinforcer assessment package based on a range of stimuli to which participant approach behaviour had already been observed, made for a higher quality intervention, rather than the randomly teacher-selected version of the first condition.

The current study incorporated the participant's preferences in **Intervention A: I.S.E.** by leaving out all items that produced an aversive response, i.e. participant withdrew self or pushed the item away. The placebo condition (**Intervention B: A.P.**), comprised items selected for their general visual and auditory properties, and for their commercially, recommended use with special need's clients. It was not based on individual preferences. Smith et al (1995) reviewing the Mason et al (1989) study, commented that the primary dependent variable *maladaptive behaviour* had not been related to an increase in appropriate responding. They concluded that this did not, therefore, explain the reduction in maladaptive behaviour. In the current study the dependent variable *self-active* engagement is seen in a related context with the purposeful interactive behaviours of *person, object* and *person-object.* This will be dealt with in the discussion of the next hypothesis.

(iii) Extra Attention:

Few of the studies cited in the Sensory Integration literature have utilised an attention-placebo condition within their research design, thereby controlling for the effects of extra attention on participant behaviour. One example, a study by Dura et al (1988), attempted to control for attention by the provision of alternative activities. Reductions in stereotypic behaviour were found under the placebo condition. This is consistent with the findings of **Group 2** whose initial intervention comprised placebo activities. Reisman (1993) suggested that the placebo activities used in the Dura et al (1988) study, may have been too stimulating for the participants, providing more than just extra attention. The same could be said of the current study where some of the activities in the placebo condition provided visual and auditory reinforcement. That is, the introduction of **Intervention B: A.P.** provided sufficient attention and stimulation to effect a reduction in the non-purposeful behaviour (i.e. *self-active*) of **Group 2.**

Extra attention given to learning disabled adults by the implementation of room management strategies have reported reductions in non-purposeful behaviour (Sturmey and Crisp, 1989). Pope (1988) reported a significant increase in pupil engagement in a classroom setting during an applied room management strategy, and also in the frequency of staff contacts. Thus it would seem to indicate that extra attention may be sufficient to effect, at least an initial change, in the levels of non-purposeful engagement. The endurance of the newly reduced levels of non-purposeful engagement needs to be

considered over subsequent stages of the discussion and in relation to any increases in purposeful behaviour.

(iv) Relevance to Current Findings:

It is important to understand that, although vestibular and tactile stimulation were frequently mentioned components of the sensory-based interventions reported on, operational procedures varied. The findings of cited studies are recognised to have a limited relationship to the present study, where an original clinical intervention was implemented (i.e. **I.S.E.**). Importantly, this research was primarily concerned with the reinforcer potency of the provided sensory stimulation. Therapy was operationalised through a response contingency model where the participant produced target behaviours in order to receive the motivating consequences.

The discussion thus far, suggests that techniques where sensory stimulation is a key artefact, e.g. Sensory Integration Therapy; reinforcement schedules of behaviour modification programmes; and when extra attention is provided, may similarly effect a reduction in the non-purposeful behaviour, *self-active*. However, it seems that only the placebo condition was not sufficient to effect a reduction in *self-neutral* behaviour, unlike an episode of the **I.S.E.** intervention with its accessible contingencies and motivating consequences.

b) Indirect Route of Therapeutic Effect [Intervention to Significant Other to Participant (A to B to C)]:

The current study employed staff team members to assist in the running of the therapy sessions for the appropriate clients from the same team base. Therefore, their role as potential agents of change must be considered throughout the discussion. They were exposed to a number of skills used by the therapist within both types of intervention sessions: (i) the provision of appropriate social opportunities; (ii) the use of a hierarchy of support cues to facilitate participant responding; (iii) the use of novel equipment; (iv) the use of a structured procedure that targeted participant responses. Additionally, they had the experience of **observing** the responding behaviour of participants within a structured setting, which may have led to more positive attitudes amongst staff and the consequential provision of more social interaction opportunities outside the therapy session. This is consistent with the view of O'Brien (1981) who stressed the importance

of primary attitudes to learning disabled people, to the expectations of carers and the provision of appropriate opportunities.

c) Interaction of the Direct and Indirect Routes (A to C and A to B to C):

In the current study, it is impossible to state the exact extent of the indirect route and therefore its real influence on the reduction of non-purposeful behaviour. The interaction of both the direct and indirect routes of change as defined in **c)** Intervention to Significant Other to Participant **(A to B to C)** and Intervention to Participant **(A to C),** is the explanation that acknowledges all the key factors of the intervention.

3. Group as a Factor

Although the level of *self-neutral* engagement was more than double that of *self-active* in **Group 2,** the significant change to the level of *self-active* was similar to that of **Group 1**. No difference existed between the two groups regarding the hypothesis.

4. Summary of Hypothesis Three

The data provide partial support for the third research hypothesis. Similar reductions in the non-purposeful behaviour of both experimental groups would seem to suggest that the effects of the placebo condition were similar to those of the **Intervention A: I.S.E.,** at least after the first phase of intervention.

The introduction of the **I.S.E. (Intervention A), (to Group 1)** has effected an initial reduction in the levels of *self-active* engagement. The **A.P.** condition has also had a similar effect on the *self-active* level of **Group 2**. *Self-neutral* behaviour has, however remained virtually unchanged within **Group 1**. After the first intervention for both groups, it would appear that *self-neutral* is less amenable to change regardless of its level at baseline (it was much higher in **Group 2** than in **Group 1**). However, the **I.S.E.** intervention representing **Group 2**'s second episode, has effected a significant decline in *self-neutral.* Therefore, it was not amenable to the **A.P.** condition delivered first, but it was responsive to the **I.S.E.** intervention delivered second.

The reductions in *self-active* behaviour seen in both experimental groups appear to be unaffected by the variations in their baseline engagement levels. However, it is not

assumed that the extra attention of the placebo condition would have effected a similar change in **Group 1**, with its *self-active* level more than double that of **Group 2** and its higher incidence of additional sensory and motor impairments. In short, the differences between the two groups revealed at baseline assessment, may be factors in the response of engagement levels to either the **I.S.E.** or **A.P.** interventions. If this is the case, the candidacy criteria for each intervention must be questioned. This will be discussed in more detail in the following Chapter which provides a critique of the current study and directions for future work.

7.2.4 Hypothesis Four: Increase in Purposeful Engagements

Hypothesis 4: The application of the **I.S.E. (Intervention A)** will effect an increase in the level of purposeful behaviour (i.e. ***person***, ***object*** and ***person-object***).

1. Introduction to Results

ANOVAs were performed on pairs of consecutive assessment data within each experimental group, i.e. assessment (1) to assessment (2); assessment (2) to (3) and so on. This part of the discussion focuses on the before and after comparisons of the different phases of intervention within each group. This is to examine: **(i)** where the changes in engagement levels have occurred in relation to the two levels of the independent variable, i.e. **I.S.E.** and **A.P.;** and **(ii)** what type change has occurred and in what direction. In order that any similarities or differences between the two groups may be explored, the results of *each* paired assessment are discussed for first **Group 1** and then **Group 2**, before moving onto the next paired assessment.

2. Interpretation of Results

2.1 Relationship Between the Type and Direction of Change, and the Intervention

(i) From Baseline to After the First Intervention

Although there were significant changes to the dependent variables in both Experimental Groups, only one group revealed significant increases in the levels of purposeful

engagement. **Group 1** who received the **I.S.E.** intervention, showed initial and significant gains in *person* and *object* engagements.

There are clear differences between the two groups after the first phase of intervention. Although both levels of the independent variable (**A: I.S.E.** and **B: A.P.**) effected initial reductions in the levels of *self-active* behaviour, only **Intervention A: I.S.E.** appears to have effected a positive rise in *person* and *object* interactions. The extra attention provided by the placebo condition (**A.P.**) has not had a similar, significant effect.

(ii) From After the First Intervention to After the Second Intervention

The results are significant for both groups. However the type and the direction of the change to engagement levels is relevant to the discussion. **Group 1**, who had received a phase of **A.P.**, showed a significant decline in *object* engagement. That is, the previous increase in purposeful engagement after the initial episode of **I.S.E.** has been maintained in all areas, apart from one, i.e. *object*, which has reversed. The introduction of the **I.S.E.** intervention to **Group 2** revealed a gain in purposeful engagement, i.e. *person* engagement, that had not been seen under the first episode of **A.P.** It also showed a small but non-significant rise in *object.* Although there was no further decline in the level of *self-active* engagement recorded after the first intervention, there was a significant decrease in *self-neutral* engagement.

(iii) From After the Second Intervention to After the Third Intervention

The interaction between the assessment points and the measures of the dependent variable was not significant for **Group 1,** who had received the **I.S.E.** intervention. However, it is worth pointing out that there was a small, non-significant increase in *object* engagement. This probably represents a part reversal of its decline seen under the previous episode of therapy, i.e. **A.P.** The interaction was significant for **Group 2,** whose third intervention was the placebo condition (**A.P.**). Simple main effects revealed a significant decline to the level of *object* engagement and a smaller, not quite significant decrease in *person* engagement.

The lack of significant effect to **Group 1** after their repeated **I.S.E.** intervention may be explained by the changing needs of the participants. This would be consistent with the

view of Burke (1991), who stressed the importance of child-environment interactions to normal behavioural and neurophysiological development. He commented on the changing influence of certain stimulus features and parameters which inform the individual's preference. Most certainly, this was observed to be the case amongst participants in **Group 1** during their repeated **I.S.E.** phase (final episode of intervention). Although not objectively measured, these clinical observations are considered relevant to the discussion. The researcher observed the rejection of previously preferred items (i.e. in the initial episode of **I.S.E.**), in favour of others. Participants were seen to be more proactive regarding the selection of stimuli and the focus of their engagements. The question posed by the researcher is: *"Had a more qualitative measuring device been employed that examined the levels of choice making and the complexity of purposeful responses, would changes have been observed?"*. This will be discussed in detail in the critique of the research in the final chapter.

2.2 Route of Therapeutic Effect and Reason for Change

a) Direct Route of Therapeutic Effect [Intervention to Participant (A to C)]:

The findings of the current research appear to relate to the findings of studies that have employed Sensory Integration techniques and some that have used sensory reinforcement within the therapeutic procedure. The reader is reminded that results reported by Sensory Integration Therapists have often been based on clinical observations rather than statistical proof. The precise interventions are not the same as those employed in the current study. Indeed, the majority seem to use different operational definitions of Sensory Integration Therapy, i.e. variations on a theme. Ottenbacher (1991) commented on the critical importance of the difference between controlled sensory stimulation and Sensory Integration but did not define what that difference was. Furthermore, therapy objectives have varied considerably across reported studies, together with the candidacy requirements. The studies cited in the discussion are restricted to those where the intervention has been delivered to people with learning disabilities and/or autism. It is acknowledged that the direct applicability of such studies to the current research is limited. They are merely cited to provide another dimension to the discussion, for the later exploration of the process of change and for the critique of the established theoretical framework in the current study .

(i) Sensory Integration Techniques:

Studies that have employed Sensory Integration techniques have reported various gains in specific examples of *'purposeful engagement'*. Resman (1981) applied repeated episodes of vestibular stimulation in a single case study and found an increase in the duration and frequency of eye contact. Therapy was delivered as non-contingent stimulation and outcomes were based on the researcher's own clinical observations. Two studies (Magrun et al, 1981; Kantner et al, 1982) reported positive changes in language development although not statistically significant. Huff and Harris (1987) observed improvements in sensori-motor development. Improvements in language and other interactive behaviours were observed amongst autistic children in separate studies by Ayres and Tickle (1980); Ayres and Mailloux (1981); and Reilly et al (1983). Again outcomes of treatment were based on the clinician's own observations.

How far are the findings from Sensory Integration research consistent with the current study?

Studies that have employed Sensory Integration Therapy techniques have frequently been descriptive rather than research specific. Their relevance to the findings of the current study lie in the use of tactile and vestibular forms of stimulation. Any specific relationship to the current study is confounded by uncontrolled variables such as baseline variation, inconsistent definition and application of intervention, lack of observer agreement and independent measurement of outcomes. In short, the limitations of the cited research brings into question its validity as a therapeutic technique.

(ii) Sensory Reinforcement and Reactivity:

What is the importance of reinforcement based on individual preferences over generally selected reinforcement?

The results of the current study are consistent with those of Pace et al (1985) and Murphy et al (1986). The first study reported the successful facilitation of adaptive skills through the presentation of stimuli known to be reinforcing to the subjects concerned. The second used a response contingency model where increases in the object exploration and manipulation of young handicapped children, were recorded. These findings and those of the current study support the view of Sandler and McLain (1987) that the type of stimulation is important to the therapeutic effect. They investigated the reinforcing properties of vestibular stimulation on multiply handicapped children and as a result

suggested that vestibular stimulation was the preferred reinforcer over food, praise, visual and auditory stimulation. Kiernan (1974) suggested that the provision of a sensory event was the most effective form of reinforcement as its satiation level could not be reached quite so easily as others, i.e. food and drink.

The effectiveness of the sensory events provided in the **I.S.E.** is considered to be relevant to the observed gains in purposeful engagement. Bambara et al (1984) observed the positive effects of object reactivity on engagement times of learning disabled children, concluding that contingent feedback features were crucial to the maintenance of participant manipulative activity.

General sensory stimulation has also been shown to effect increases in aspects of purposeful activity. The positive effects of contingent and non-contingent stimuli within a sensory leisure environment, e.g. *'Snoezelen'*, have been evaluated. Ashby et al (1995) found significant improvements in the concentration of two out of eight participants during task activity. However, measures were only taken immediately after each intervention session, thereby ignoring the importance of a generalised effect. The results could relate more to the demands of the task in relation to each participant's skill set, rather than an actual therapeutic effect. Furthermore, the choice of stimuli in the sensory environment was also not specific for individuals. The current study has identified a positive and more integrated effect on the purposeful behaviour of its participants, i.e. measures were taken at different times on different days that were independent of any ongoing activity. Measurement of the effects of the intervention were removed from the actual therapy session.

b) Indirect Route of Therapeutic Effect [Intervention to Significant Other to Participant (A to B to C)]:

The role of the staff members as potential agents of change within the therapy process needs to be constantly reviewed. The emergence of new responses to *person* and *object* contacts by participants in **Group 1** during **Intervention A: I.S.E.**, may have had a positive effect on the confident use of appropriate facilitation skills by staff with their clients. The intervention sessions had provided a 'safe' environment for the practice of new interaction strategies. This has addressed the need for a link to be established between the 'classroom' and the 'natural environment' regarding the transference of

skills learned (McLeod et al, 1995). In their study of the effects of staff training on communication strategies for carer use with the learning disabled, they reported that some participants expressed apprehension regarding the 'trying out' of their new skills. The presence of this link in the indirect route of therapeutic effect is evident in the significant other's role of 'individual helper' in therapy sessions.

The exact influence of the indirect route is not calculable in the context of the current study and does not provide a sole explanation for the various changes in engagement levels. The lack of measurement of the indirect route will be discussed in the critique of the current study in the final chapter.

c) Interaction of Direct and Indirect Routes (A to C and A to B to C):

The interaction of the direct and indirect routes in the context of the components of each separate intervention, is the most likely explanation for therapeutic effects.

3. Group as a Factor

It might have been expected that the higher incidence of sensory and motor impairments in **Group 1** made the participants particularly amenable to the techniques of tactile and vestibular stimulation used in **Intervention A: I.S.E.** The use of tactile cues has long been recognised in communication strategies with the deaf-blind (Mountain, 1984). However, similar gains were also observed in **Group 2** after the second episode of intervention **(I.S.E.)**. Therefore, this was not a significant factor regarding the group effects of the **I.S.E.** intervention.

4. Summary of Hypothesis Four

The data are in partial support of the fourth hypothesis. It appears that the **I.S.E.** intervention with its response contingent presentation of stimuli, together with the relationship between the properties of stimuli and the responses of the individual, are critical to the gains in purposeful engagement (*person* and *object)* seen in **Group 1**, after the first episode of intervention **(I.S.E.)**. The lack of progress in **Group 2** who received the placebo condition **(A.P.)**, may be due to critical differences in the **A.P.** intervention, i.e. to the **I.S.E.** components already mentioned.

Furthermore, the second episode of intervention (**A.P.**) delivered to **Group 1** resulted in, not only a lack of increase in purposeful engagement, but a significant decline in *object* interactions. That is, the previous increase after the initial episode of **I.S.E.** had been maintained in all engagements, apart from one, which had reversed. Similar effect was shown by **Group 2** after their third intervention **(A.P.)** with a decline to the level of *object* engagement and a smaller, not quite significant decrease in *person* engagement.

The second episode of intervention **(I.S.E.)** delivered to **Group 2** revealed a gain in purposeful engagement that had not been seen under the first episode of **A.P.**, i.e. *person* engagement. It also showed a small but non-significant rise in *object.* Interestingly, although there was no further decline in the level of *self-active* engagement recorded after the first intervention, there was a significant decrease in *self-neutral* engagement. It may be that the type of intervention is critically important to the successful manipulation of *self-neutral* engagement levels.

The third phase of intervention experienced by **Group 1** was **I.S.E.** Further gains in purposeful engagements might have been expected, consistent with the findings of the previous episode of **I.S.E.** therapy. However, this was not the case, apart from a small, non-significant increase in *object* engagement. This probably represented a part reversal of its decline seen under the previous episode of **A.P.** therapy. Two possible explanations are suggested. **Firstly**, that the effects of the **I.S.E.** intervention had reached saturation point after the first episode of intervention providing limited facility for change. **Secondly**, the apparent lack of new gains may be due to the limited sensitivity of the assessment tool in measuring changes in response complexity, i.e. the current method of assessment observed quantity of response types rather than quality.

I.S.E. appears to have effected gains in purposeful engagements, at least in its primary phase. **A.P.** has not only *not* effected gains in purposeful engagement, but has influenced a reversal in previous gains observed under the **I.S.E.** intervention.

Finally, it is true that, consistent with a reduction in the level of *self-active* engagement, the application of the **I.S.E. (Intervention A)** has effected a significant increase in the levels of *person* and *object* within **Group 1** and **Group 2**. Additionally, it was found

that after an initial decline in *self-active* after the **A.P.** intervention, **Group 2** who had a higher level of *self-neutral* at baseline, showed its reduction. Not only were the effects of the **I.S.E.** greater than those of the **A.P.**, but there were no significant increases recorded after the delivery of **A.P.** to either group. The **I.S.E.** appears to have been the more potent of the two interventions. That is, whilst the extra attention provided by the placebo condition effected an initial reduction in *self-active* behaviour, it was not sufficient to effect rises in *person* or *object* engagements.

7.2.5 Hypothesis Five: Changes in Engagement Levels from Baseline

Hypothesis 5: There will be a significant increase in the level of purposeful behaviour, (i.e. ***person, object*** and ***person-object***), and a reduction in the level of non-purposeful behaviour (i.e. ***self-neutral*** and ***self-active***) compared with baseline.

1. Introduction to Results

ANOVAs were performed on pairs of assessment data within each experimental group, from baseline to after the third and fourth interventions, i.e. assessment (1) to assessment (3);. Changes in engagement levels over each paired assessment points were significant. The results are discussed according to the type of intervention most recently administered to the group, i.e. **(i) I.S.E.** or **(ii) A.P.** This part of the discussion focuses on comparisons between the baseline assessment and after subsequent interventions. This is to examine the cumulative effects of the interventions on the engagement levels of participants compared with baseline measurements. In order that any similarities or differences between the two groups may be explored, the results of *each* paired assessment are discussed according to the most recent intervention: **I.S.E.** or **A.P.**

2. Interpretation of Results

2.1 Relationship Between the Type and Direction of Change, and the Intervention

(i) Most Recent Intervention: I.S.E.

Experimental Group 1 [after the third intervention phase - assessments (1) to (4)]:

A significant decline in *self-active* is revealed. This is a similar result to that after the first phase of **Intervention A: I.S.E.** The significant effect seen here may not be new. It may have been due to the maintained effects of the first intervention throughout following phases of therapy. Similarly, the significant increases in *person* and *object* engagements both appeared after the first episode of **I.S.E.** There was a small, significant gain in *person-object* engagement. This has not been revealed in any of the other sets of results. Therefore its change has been minimal over consecutive phases of therapy and is only shown to be significant in a paired comparison of the baseline assessment and after the final intervention. Furthermore, *person-object* engagement is acknowledged to be the most complex of the engagement classifications by virtue of the duality of its interactive components.

The repeated episode of **I.S.E.** intervention applied to **Group 1** appears to have brought no further effect to the level of *self-active* although it remains significantly below the baseline level. This may be due to the minimal level having been reached for this group after the first intervention, i.e. there is no room for further decline. Alternatively, this is the ceiling response for participants to **I.S.E.** intervention and a different therapy or intervention strategy is required to bring about any further changes, such as more intensive timetabling of suitable activities.

Experimental Group 2 [after the second intervention phase - assessments (1) to (3)]:

This comparison revealed significant changes to not only *person* and *object* engagements, but also to the more complex interactive behaviour of *person-object.* This result shows the cumulative effect of interventions overtime and that after the **I.S.E.** intervention (assessment point 3), its change from baseline is significant. This is similar to the previous comparison for **Group 1**. Where **I.S.E.** is the most recent intervention and does not represent the primary episode of therapy, the gains in *person-object* engagement are significant.

(ii) Most Recent Intervention: A.P.

Experimental Group 1 [after the third intervention phase - assessments (1) to (3)]:

Self-active engagement is still significantly less than its baseline measurement thus indicating that the change achieved after the first intervention **(I.S.E.)** was relatively stable during the placebo condition of the second intervention **(A.P.)**. A significant increase in *person* is observed which again would seem to indicate the maintenance of the initial effect seen after the first intervention, although *object* engagement shows no significant difference to its baseline measurement. It should be noted that the level of *object* engagement showed a decrease in the before and after comparison of the **A.P.** intervention, i.e. assessments (2) to (3). One factor may have been the inappropriate response demands of **A.P.** stimuli. Another factor may have been the lack of motivating consequences defined by individual preferences.

Experimental Group 2 [after the second intervention phase - assessment (1) to (4)]:

An almost significant decline in *self-active* was shown. A small rise was previously observed in the before and after comparison of the **A.P.** intervention [between assessments (3) and (4)]. Therefore the significant reduction in *self-active* seen after the initial episode of intervention **(A.P.)**, was not maintained throughout the intervention period. This is the opposite of the changes seen in **Group 1** after their final intervention. There is no significant change to the values of the other categories of engagement.

(iii) Summary of Relevance:

The stability of changes brought about by **I.S.E.** in the first episode of therapy in **Group 1** has been shown to be greater than for those brought about by the placebo condition **(A.P.)** in **Group 2**. This stage of the analysis has revealed small but significant gains in *person-object* engagement in both groups where **I.S.E.** was the most recent intervention. This is perhaps, the most interesting finding from this stage and will be explored in the following discussion.

2.2 Route of Therapeutic Effect and Reason for Change

a) Direct Route of Therapeutic Effect [Intervention to Participant (A to C)]:

Intervention A: I.S.E. specifically targeted *person-object* in its organisation of social interaction opportunities within the therapy sessions for those participants who had

demonstrated an ability to *relate object(s) to other person.* It was acknowledged that this was the most sophisticated level of engagement to be measured in the study and therefore, would probably be the latest to emerge and with the smallest effect. The findings at this stage of the analysis are consistent with this premise. The gains shown in *person-object* engagement may relate to the sensory feedback features of objects selected for use in the **I.S.E.** Their enhanced features may have facilitated *object* engagement and therefore, *person-object* engagement. This will be discussed with regard to the different gains in purposeful engagement between the two interventions.

Greater changes to the engagement levels have been revealed when **I.S.E.** was the most recent intervention: significant decline in *self-active*; rises in *person, object* and *person-object.* Changes where **A.P.** was the most recent intervention, were limited to a significant gain in *person* which had already been seen after the previous **I.S.E.** intervention, and an almost significant decline in *self-active* which had also been significant after the previous **I.S.E.**

Why gains in *person* engagement from a prior **I.S.E.** phase should be more enduring than *object* engagement in the following **A.P.** phase, is worth considering. The objects presented in the **I.S.E.** intervention were selected for their sensory reactivity potential. Each item produced sensory feedback when manipulated or touched by the participant, i.e. the vibro-bubble produced vibrations upon touch contact of its metal sensors. Some of the objects in the **A.P.** demanded a more sophisticated, functional response from participants, i.e. the selection of familiar objects such as toothbrush and comb required the symbolic demonstration of their use. Others, although selected for their commercial recommendation as 'Special Needs' equipment, comprised various levels of response demand with different forms of visual and auditory feedback.

Did the difference in response demands of the objects used in each intervention affect the endurance of object engagement?

Burke (1991) commented, in his review of the implications of a disturbance in responding to complex environmental stimuli, that certain stimulus features may influence a child's engagement, such as, rate of presentation, novelty, predictability and stimulus complexity. This would be consistent with the findings of the current study. The **I.S.E.** intervention used novel items where their simple response demands, i.e. basic

touch contact, were sufficient to operate the stimulus feedback feature, i.e. vibration. The simplicity of access would have influenced the rate of operation (i.e. presentation). Furthermore, there were a number of items that had slightly different methods of operation, i.e. touch contact; light pressure to operate vibrating cushion; move tube into the upright position for the emission of vibrations, which varied the demands but still produced the same, predictable feedback feature. The **A.P.** items provided inconsistent feedback and response demands were various.

b) Indirect Route of Therapeutic Effect [Intervention to Significant Other to Participant (A to B to C)]:

Why do the greater changes from baseline occur after I.S.E. as the most recent intervention?

In the context of the indirect route of therapeutic effect, does this mean that the significant others were more susceptible to the **I.S.E.** therapy than the **A.P.**? In short, the components of the **I.S.E.** intervention could have been as important to the staff members as to the participants. Their interaction and communication strategies in the natural environment may have been linked to the ongoing sessions of **I.S.E.** which provided them with the opportunities to practise the relevant skills. Discussion regarding the significance of staff behaviour to the measured changes in engagement levels will be discussed under the next stage.

c) Interaction of Direct and Indirect Routes (A to C and A to B to C):

The enhanced feedback features of the **I.S.E.** stimuli together with their response demands have been seen to variously apply to the responding behaviour of both the participants and their significant others. The interaction of the direct and indirect routes of therapeutic effect is once again considered to be relevant to the research findings.

3. Group as a Factor

The responses of the two groups were fairly consistent. The variations which existed at baseline assessment do not appear to have had an influence over the outcomes of the interventions. The only difference was in the number of episodes of each intervention: **Group 1** received two episodes of **I.S.E.**; **Group 2** received two episodes of **A.P.** intervention. This may be a factor in the maintenance of previous gains in purposeful behaviour, seen in **Group 1** after their final intervention. The significant decline in *self-*

active seen in **Group 2**, after an initial phase of **A.P.** was not maintained after a repeated episode of **A.P.**

4. Summary of Hypothesis Five

The data provide support for the fifth hypothesis. Measurements from baseline assessment to after each phase of **I.S.E. (Intervention A)** have shown significant increases in the levels of purposeful behaviour, i.e. *person, object* and *person-object,* and a reduction in the level of non-purposeful behaviour, i.e. *self-active.* This has compared favourably with the same measures taken after each **A.P. (Intervention B)** where only **Group 1** showed the maintained reduction of *self-active* (achieved after the first episode of **I.S.E.**), and **Group 2** revealed its re-emergence. Purposeful engagement was demonstrated by the **A.P.** in the sole rise of *person* engagement. However, the almost significant decline in *object* engagement was also revealed.

7.2.6 Hypothesis Six: Contrasting Effects of the Two Interventions (I.S.E. & A.P.)

Hypothesis 6: The effects of an initial phase of **I.S.E. (Intervention A)** will be significantly greater than the effects of an initial phase of the attention-placebo **(Intervention B)**.

1. Introduction to Results

For the closer examination of the differences between the two interventions and their potential as agents of change, assessment data from after the first phase of **I.S.E.** intervention was combined for both experimental groups (i.e. first episode for **Group 1**; second episode for **Group 2**). The corresponding data for the attention-placebo condition **(A.P.)** was dealt with in a similar way.

2. Interpretation of Results

2.1 Relationship Between Type and Direction of Change, and the Intervention

(i) After the First Phase of I.S.E. Intervention:

The change to the engagement levels between the assessment points was found to be highly significant. Significant effects to the engagement levels were shown in a decline of *self-active* and an increase in *person* and *object* engagements.

(ii) After the First Phase of A.P. Intervention:

The change to the engagement levels between the assessment points was not significant.

2.2 Route of Therapeutic Effect and Reason for Change

a) Direct Route of Therapeutic Effect [Intervention to Participant (A to C)]:

Consideration is now given to the specific components of the **I.S.E.** intervention that have brought about these changes to the engagement levels. It is useful to consider the findings of the current study in relation to the theoretical writings outlined in the earlier literature review, i.e. Sensory Integration Theory and the role of sensory reinforcement.

(i) Sensory Integration Theory:

Sensory Integration Theory outlines a number of roles that are considered to be crucial factors within the therapy process. These are now critically reviewed.

Functional interdependence was defined as part of the neurological process of development by the Sensory Integration Theorists (Ayres, 1972, 78, 89; Fisher, Murray and Bundy, 1991). The totality of brain function supports the idea that selectively stimulating one sensory modality will affect the functioning of others. This was critical to Sensory Integration Therapy where stimulation was provided in order to enhance whole body adaptation. Treatment through one modality was assumed to effect the functioning in another. Thus Resman (1981), applied intensive vestibular stimulation to improve eye contact in his participants. Fisher et al (1991) incorporated the role of the environment in their explanation of therapeutic change but not in great detail. The presence of functional

interdependence is acknowledged by the researcher, although it is important to recognise the difference between the current study and the work of Ayres and her colleagues.

Although the sensory modalities of tactile and vestibular were targeted for sensory reinforcement within the **I.S.E.** intervention procedure, similar to Sensory Integration Therapy, it was part of an active, integrated process. This process was dependent on the motor responses of the individual and a hierarchy of auditory and visual cues, i.e. a core vocabulary of spoken words and signs was used. Functional interdependence of the sensory-motor modalities is acknowledged at every level of the **I.S.E.** intervention process, from the social interaction opportunities provided, to the response-contingency of therapy and the organisation and interpretation of sensory data. The environment is integral to this process. Furthermore, if the notion of functional interdependence is fundamental to the individual's ability to process information for use, it must apply to all interventions equally. In short, this does not explain the difference between the effects of the two interventions (**A.P.** and **I.S.E.**).

The role of brain mechanisms was defined as an open system of interrelated structures at various levels of the C.N.S. where sensory integration is said to occur. The notion of an existing hierarchy of C.N.S. structures potentially neglects the totality of brain function. Furthermore, it separates the C.N.S. from the environment. The current study views the environment in a three dimensional relationship with the central processing of the human organism and the adaptive responding as shown in the earlier model of the **I.S.E.** intervention (p. 97).

The changes effected by the **I.S.E.** are not explained by the *specific* targeting of lower mechanisms so that higher mechanisms may be influenced, but by the organisation of the environment. Social interaction opportunities suited to the skills of the individual were provided. However, it could also be said that the activities in the placebo condition afforded the participant various opportunities to respond in a certain way as well. It would appear that it is the components of those opportunities, i.e. the distinctive features of stimuli and the response demands of activities, that are critical to the explanation of therapeutic change. This will be discussed further.

The Role of Neural Plasticity has been defined as the inherent flexibility of neural structures, such that their quality can be influenced by existing activity without loss of utility. The phenomenon of neural plasticity would serve to explain the emergence of new adaptive behaviours during the course of therapy allowing for the assimilation and accommodation of incoming information. It has been related to the ***Role of Neural Synapse,*** i.e. synaptic enrichment is viewed as part of the process of therapeutic change which also occurs in normal development (Fisher et al, 1991).

However, neural plasticity and the notion of synaptic enrichment ignore the importance of environmental contingencies to the emergence and generalisation of adaptive responses. There must surely be a link with the changing role of the significant others as a result of their involvement in the intervention. This will be discussed under the **'indirect route of therapeutic effect'**. Neural plasticity of the client needs to be viewed in the same context as the flexible role of the significant other. It does not provide a satisfactory explanation of the different effects of the two interventions, which must have had similar potential for both neural plasticity and significant other adaptation. Nor does it explore the permanency of change. If the neural structures of participants had changed or been enriched as a result of the **I.S.E.** intervention, what explanation is afforded to the decline of *object* engagement in **Group 1,** after their second intervention**: A.P.** The role of environmental contingency must be important, together with the quality of stimuli and the response demands of the activities. This will be addressed in detail with regard to **Hypotheses 7** and **8** (follow-up assessments).

The role of sensation refers to the interactions amongst sensory stimulation, C.N.S. activity and adaptive responding. Importantly, it highlights the environment. Sensory Integration Therapy involves the application of direct sensory stimulation that treats the sensory integration deficit in the individual with the purpose of eliciting a more appropriate response (Fisher et al, 1991). The **I.S.E.** intervention provided sensations identified to be personally motivating to the individual such that they served to reinforce their adaptive responses. Therefore, the underlying rationale for the selection of stimuli and its relationship to the process of change, differs between the current study and Sensory Integration Therapy.

There was a fundamental difference between the two interventions used in the current study. The placebo condition involved the use of some non-contingent stimuli although not exclusively, such as general objects and flash cards. The special needs equipment used, provided contingent feedback in terms of visual and auditory sensations but it was not selected by its motivating properties to the individual. Therefore the changes asserted by the **I.S.E.** intervention appear to have been due to the response contingent presentation of stimuli and the relationship between the properties of stimuli and the responses of the individual. In short, it is not the amount of extra attention that has effected gains in purposeful engagements but the quality of the therapy content, i.e. the role of sensation in relation to individual preferences and the response contingency procedure.

The role of organism - environment interaction has been referred to in Tickle's synchronic model of Sensory Integration effectiveness (1988). She defined the feedback loop that provides the person with information about their own actions on the environment. The feedback mechanism is important to human functioning. For example, the communication skills of the person who acquires a hearing problem will deteriorate with the loss of the auditory feedback loop. The person with a loss of feeling in a limb may hurt it without knowing. Thus the individual's actions provide information about the environment and the motor action executed. Presumably, this feedback loop was in operation for both interventions. However, the quality of sensory information available in relation to motor action feedback may be the distinguishing feature. In the **I.S.E.** the sensory information was structured according to the individual preferences of participants. This was not the case in the placebo condition.

(ii) Sensory Reinforcement and Reactivity Potential:

Does the sensory reinforcement of the social interaction opportunities provided in the intervention, prepare the person to access other available, environmental contingencies?

The **I.S.E.** intervention employed procedures similar to those used in behaviour modification programmes such as the 'differential reinforcement of alternative behaviour' (D.R.A.), where desirable behaviours are targeted for reinforcement (Jones et al, 1995). There have been very few studies reporting the use of D.R.A. procedures. Eason, White and Newsom (1982) investigating the effects of toy play on stereotypic behaviour using

extrinsic reinforcers, concluded that the toy play was successful in effecting a decline in the stereotypies. Important differences exist in the current study which did not require the total absence of any stereotypy in order for the stimulating consequence to be provided. It was possible for a participant to engage in *person* contact at the same time as *self-active* behaviour. Furthermore the sensory reinforcement was **intrinsic** to the interaction opportunities. The schedule used was one of immediate sensory reinforcement for purposeful responding. Sensory stimulation was applied to the participant upon the emission of the target behaviour(s).

Assessment of participants was carried out in the natural environment. The significant gains in *person* and *object* engagements, together with the decline in *self-active* might be explained by the behaviour modification principles outlined above. The expanded use of the participant response repertoire in the intervention serves as an introduction to the contingencies present in the natural environment. That is, after the reinforcement experiences in the therapy sessions, the participant was more amenable to stimuli in the natural setting. A connection between a purposeful behaviour and a motivating consequence had been established.

Is the potency of sensory stimuli an important component of I.S.E. intervention?

The amenability of participants to environmental contingencies may be related to the potency and reinforcement of the sensory stimuli used in **Intervention A: I.S.E.**. The activities in the **A.P.** had neither been identified according to the responding behaviour of individuals or designed specifically with their contingent reinforcement in mind, i.e. picture-object matching and identification of items. Furthermore, the response demands of the activities did not focus on the communication partnership of the significant other and client, i.e. in the **A.P.** all participants were variously facilitated to produce Makaton signs in relation to stimuli. The placebo condition (**A.P.**), although sufficient to effect an initial reduction in *self-active* behaviour, was not enough to produce significant gains in *person* or *object* interactions.

The explanation of the different responses to the two interventions needs to be discussed in relation to the potency of stimuli, their reactivity to participant responding and the response demands. The **I.S.E.** equipment was defined according to the sensory feedback features of the tactile and vestibular systems. A dimensional analysis and specification of

the equipment can be found in **Appendix C1**. **A.P.** equipment was defined by its symbolic functions or uses, (i.e. hairbrush; cup; plate; fork etc.) and the feedback features of the visual and auditory systems, (i.e. equipment which emitted sounds upon operation or else possessed distinctive attributes regarding colour, form, texture, light and movement). The equipment selected was designed for special educational needs and ordered from the relevant commercial catalogues. Therefore, major differences existed between the two interventions regarding sensory potency, reactivity and the response demands of opportunities provided.

The phenomenon of sensory reactivity in the current study was investigated by Bambara et al (1984). They used two sets of identically, reactive toys, one set being modified so that the sensory feedback features were eliminated. The severely learning disabled children in the study showed greater visual attention and manipulative activity with the reactive items. Murphy et al (1986) also found that enhanced sensory feedback improved the quantity and quality of toy contact amongst profoundly learning disabled children. Sensory reactivity is a distinguishing feature of **I.S.E.** therapy.

What other key differences existed between the two interventions?

I.S.E. utilised a defined hierarchy of support cues characterised by minimal verbal coding (i.e. a standard core vocabulary); and enhanced by iconic signs, i.e. Makaton. The most appropriate cues for the individual were identified through the administration of the Decision-Making Schedule. The cues were designed to facilitate the target response upon the presentation of the contingency, i.e. the sensory stimuli. Thus the therapist would attract the participant's attention whilst showing the potential consequence, i.e. an outstretched hand with lotion squirted on it, to provoke the appropriate responding behaviour, i.e. an arm reach directed to the therapist.

A.P. also utilised a defined hierarchy of support cues and instructions according to the requirements of the activities. These were characterised by standard verbal phrases and iconic signs. Use of the cues varied according to the participant's responding behaviour. Their main purpose was to direct the participant's actions but without the contingency, i.e. therapist asked participant to 'Find the brush' whilst holding up a matching picture of the object. One key difference in the two interventions lies in the fact the choice of support cues in **I.S.E.** were inextricably linked to the motivating consequences preferred

by the individual. This is based on the observation that the participant required less support when motivated. This is consistent with the view expressed by Sandler and McLain (1987) in their study of the effects of response contingent vestibular stimulation on multiply handicapped children.

I.S.E. activities were based on the clinical rationale defined in the final section of **Chapter 2**, and by the administration of a Decision-Making Schedule to each participant. Its main purpose was operationalised in four key areas: (i) to identify those feedback features which represented motivating consequences to the individual; (ii) to describe his/her response repertoire; (iii) to ascertain which constituents of the interaction were meaningful to the participant, i.e. person, object or event; and (iv) to identify the means by which the individual rejects presented items. Activities were thus devised to reflect the information collected by the administration of the Decision-Making Schedule.

A.P. activities were based on the development of symbolic understanding and commercially recommended activities and equipment for people with special educational needs. They were not based on individual preferences. The **I.S.E.** therapy procedure was based on a response contingency model. The application of sensory stimulation was dependent on the emission of the target response(s) by the participant. Thus it reinforced the purposeful actions of the individual. **A.P.** therapy involved the demonstration of object use; visual matching of items; appropriate sign production; visual attention and cause-effect activities. Social praise as a reinforcer of participant activity was employed, i.e. *'that's right'*, *'well done'*, etc. This has been found to be less effective as a reinforcer by Sandler and McLain (1987),

b) Indirect Route of Therapeutic Effect [Intervention to Significant Other to Participant (A to B to C)]:

Both **I.S.E.** and **A.P.** therapy had a similarly identified purpose. This was in order that the attitudes of keyworkers/significant others, who might variously be involved in the assessment and intervention procedures, should be similar regarding the two interventions. The researcher wished to control for potential product bias thereby giving each an equal chance to work. The broad aim was to improve the interactions and communications of all participants.

However, certain staff behaviours led the researcher to conclude that the enhanced sensory feedback features of the **I.S.E.** stimuli were more motivating to work with than those in the **A.P.** Although this evidence is based on the clinical observations of the researcher, it is worth mentioning in the context of this discussion. Firstly, the staff were observed to 'try out' the sensory equipment themselves throughout the therapy sessions, commenting informally on their sensory experiences. Secondly, they made requests to the researcher to 'borrow' the equipment at other times and when the participants were concurrently receiving the **A.P.** intervention. Thirdly, at least two of the staff teams in the centre started to purchase and collect their own sensory equipment for use outside the researcher's control!

c) Interaction of Direct and Indirect Routes (A to C and A to B to C):

In summary, it appears that the core components of the **I.S.E.** intervention, i.e. the potency and reactivity of sensory stimuli; the support cues that helped to create the opportunity for the participant's responses; the selection of sensory reinforcing activities based on personal preferences; and the therapy procedure incorporating a response contingent model; have been crucial to the effects on engagement levels. The listed components are the essential features that distinguish the **I.S.E.** from the attention placebo condition, i.e. **A.P.** Their effects on staff behaviour regarding the provision of social interaction opportunities outside the therapy sessions is a possible factor of influence that needs to be considered in future research initiatives.

3. Group as a Factor

The variation in groups is not considered to be a factor as this part of the analysis combines similar data from both groups.

4. Summary of Hypothesis Six

The data provide confirmatory evidence for the sixth hypothesis. The combined effects of an initial phase of **I.S.E. (Intervention A)** on both experimental groups, are indeed significantly greater than the combined effects of an initial phase of an attention-placebo condition **(Intervention B)**. In fact, only analysis of the **I.S.E.** data shows the interaction between the assessment points and the measures of interactive behaviours to be significant. The placebo condition **(A.P.)** appears to have had no significant effect on engagement levels in a before and afterwards comparison.

This would seem to highlight the potency of the **I.S.E.** construct and indicates that extra attention is not sufficient in itself to effect a reduction in non-purposeful behaviour, and the consequential growth in purposeful interaction. Thus, the type of sensory stimuli used in the therapy programme together with its behaviourist application is considered to be of prime importance. These findings support the validity of the intervention approach termed: **I.S.E.**

7.2.7 Hypothesis Seven: Maintenance of Effects One Month After

Hypothesis 7: The positive effects of the **I.S.E. (Intervention A)** will be maintained up to one month after the withdrawal of the intervention.

1. Introduction to Results

Pairs of assessment data were analysed: (i) From After The Final Intervention to One Month Follow-up; and (ii) From Baseline to One Month Follow-up. This was to examine the endurance of the effects of the two interventions once therapy had been terminated. One participant from each experimental group was unavailable for follow-up assessment. This left six participants in **Group 1** and eight participants in **Group 2**.

2. Interpretation of Results

2.1 Relationship Between Type and Direction of Change and the Intervention

(i) From After The Final Intervention to One Month Follow-up:

The results for **Group 1** showed no change in the engagement levels one month after the termination of the last intervention **(I.S.E.)**. These results show that the effects of therapy have been maintained during the one month follow-up period. The level of *person* engagement revealed the initial stages of decline, although this was not a significant effect.

The results were similar for **Group 2**. There was no significant change to the engagement levels over the two assessment points, i.e. the effects of intervention are virtually stable up to one month after the withdrawal of therapy. A small but non-

significant gain in *object* engagement was also shown. It is unclear why this should have occurred and it is suggested that other environmental contingencies may have caused this effect, i.e. the timetabling of appropriate activities by staff who were involved in the therapy sessions; the purchase and provision of similar items to those used in the **I.S.E.** intervention.

(ii) From Baseline to One Month Follow-up:

One month after the withdrawal of therapy (**I.S.E.** was the last episode), the engagement levels of **Group 1** were significantly different than their baseline measurement. In particular, significant effects were shown in a decline of *self-active*; and increases to *person* and *object* engagements. This means that the engagement levels at the one month follow-up are significantly different from the baseline measures.

In contrast, the engagement levels of **Group 2** showed no significant change from baseline assessment to one month after the withdrawal of therapy (**A.P.** was the last episode), although two of the simple main effects (i.e. *person* and *object*) shown as gains, were almost significant. This lack of significance may be indicative of the initial deterioration of these engagement levels after the withdrawal of therapy, i.e. their significance shown in the former analysis of baseline to after the last intervention, is no longer evident one month after the withdrawal of therapy.

The differences between the results of the two groups may be due to the type of last intervention received by each group. **Group 1**, who had received **I.S.E.** showed the maintenance of therapeutic effects by a significant difference between the engagement levels at baseline and at the first follow-up. **Group 2** did not show a significant difference in an identical analysis and even revealed the emerging decline to the previously increased *person* and *object* engagements. The effects demonstrated by the **I.S.E.** intervention are observed to be more robust than those under the **A.P.** condition, i.e. there was no change to levels at the one month follow-up assessment. The central question to be asked is: ***How are the changes in engagement levels maintained one month after the withdrawal of therapy?*** This will be addressed in the following discussion and in relation to the theoretical framework of the current study.

2.2 Route of Therapeutic Effect and Reason for Change

a) Direct Route of Therapeutic Effect [Intervention to Participant (A to C)]:

Does the process of sensory integration account for the endurance of therapeutic effects?

What explanations are offered by the various clinical rationales that account for the maintenance of therapeutic effects in the groups? The goal of Sensory Integration Therapy has been referred to as the provision of sensory stimulation *'to improve the sensory processing capabilities of the brain as a precursor to learning'* (Arendt et al, 1988a; p. 403). Sensory Integration Theory would account for the maintenance of therapeutic gains by improved C.N.S. organisation together with synaptic enrichment. If neural reorganisation is the central outcome of therapy, then changes in engagement behaviours should be enduring (Arendt et al, 1988b). This provides one possible explanation for the maintenance of therapy effects at the one month follow up assessment. However, there is no evidence to prove this theoretical assumption, nor have there been research studies to investigate this level of outcome. This aspect of Sensory Integration Theory will be discussed in more detail in the context of the second follow-up assessment, four months after the withdrawal of therapy.

Has the role of sensory reinforcement affected the endurance of therapy outcomes?

The maintenance of therapy outcomes may also be explained by the principles of behaviour modification, i.e. D.R.A. It has been pointed out that this type of schedule has the potential to expand the response repertoire of the individual whilst reducing the stereotypy (Jones et al, 1995). The findings of the current study are related to those of Eason et al (1982), who thought that the generalisation and maintenance of therapy outcomes was probably due to the experience of structured toy play, which had introduced the participant to the contingent reinforcement in the natural environment. This provides one possible explanation for the maintenance of therapeutic gains one month after the withdrawal of therapy.

Is the permanency of the changes in engagement levels dependent on the provision of environmental contingencies?

The participant may be more amenable to environmental stimuli after a period of intervention but there is a mutually dependent relationship between the participant's

response repertoire and the provision of appropriate environmental contingencies. The role of the staff members is an important component of this discussion. This is addressed in the next section.

b) Indirect Route of Therapeutic Effect [Intervention to Significant Other to Participant (A to B to C)]:

Has the changing role of significant other effected the maintenance of therapeutic effects?

The provision of appropriate interaction opportunities and environmental contingencies within the natural environment has been stressed with regard to the maintenance of therapeutic effects. One cannot consider the role of the environment without examining the role of the significant others. Their involvement in the running of sessions as individual helpers has already been outlined. In the context of the intervention, staff were facilitated to provide participants with social interaction opportunities in a response contingency model. In short, the staff members observed and tried out new strategies for interacting with their clients, during the course of therapy.

The staff members were potential agents for the maintenance of therapeutic effects. By using the learned strategies and presenting similar opportunities for contingent reinforcement to the participants, they could have had an effect over the situation. Their interactive behaviours with the participants, although unproved in the current research, may have changed as a result of the intervention. In some teams in the Day Centre, the generalisation of therapy strategies was observed to go further. Certain stimuli and activities were replicated by staff members thereby simulating the conditions of the actual intervention. This was particularly noticeable of the sensory-based stimuli in the **I.S.E.** condition. The researcher also noticed the purchase, acquisition and use of sensory items by staff members.

c) Interaction of Direct and Indirect Routes (A to C and A to B to C):

Once again, the interaction of both the direct and indirect routes of therapeutic effect is considered to be likely as the very nature of the intervention was a combination of the two approaches, i.e. the direct therapy sessions assigned the role of 'individual helper' to staff involved their coaching in relevant clinical skills. The potential effects of either approach cannot be ignored. Furthermore, the direct route is essential to the changing

formulation of the indirect route, i.e. staff behaviour was modified in therapy sessions which may have affected the subsequent social interaction opportunities in the environment.

3. Group as a Factor

The lack of a significant decline in *self-active* in the baseline to first follow-up assessment of **Group 2** compared with **Group 1**, may be explained by differences in the two groups. The fact that the last episode of intervention delivered to **Group 2** was **A.P.**, may have effected the early reversal of previous therapeutic effects, i.e. an almost significant increase in *self-active* was shown before and after the final **A.P.** intervention. This means that the type of intervention delivered in the last episode is probably a significant factor in the maintenance of therapeutic effects.

4. Summary of Hypothesis Seven

The data provide support for the seventh hypothesis. The positive effects of the **I.S.E. (Intervention A)** have been maintained up to one month after the withdrawal of the intervention. Maintenance of engagement levels has been observed for both groups, from after the last intervention to the first follow-up, i.e. there was no significant change between assessments (4) and (5). Further examination of the simple main effects for **Group 1**, between baseline assessment and (5), showed significant increases in the purposeful interactions of *person* and *object,* with a significant decline in *self-active*. That is, the gains attained from therapy, were still present up to one month after its withdrawal.

Group 2 also showed the virtual stability of engagement levels at the one month follow-up assessment, although, when changes from the baseline to the first follow up were computed, no significant difference was revealed. However, examination of the simple main effects showed small but non-significant increases in *person* and *object* engagements. Inspection of a previous stage of **Group 2's** analysis, reveals that reversion to baseline levels occurred after the third therapy phase (**A.P.**). It appears that the gains seen after the second episode of intervention (**I.S.E.**), have regressed after the following placebo condition. Specifically, *object* engagement reduced significantly and *person* engagement also showed a decline that was almost significant. Therefore the

positive effects of the **I.S.E.** intervention appear to be more robust or enduring than those of the **A.P.** Furthermore, the **A.P.** has had a detrimental effect on gains achieved under a previous episode of **I.S.E.** It has been suggested that the limited compatibility of the **A.P.** intervention and the participant's skill sets may be responsible, together with a lack of motivating consequences.

7.2.8 Hypothesis Eight: Maintenance of Effects Four Months After

Hypothesis 8: The positive effects of the **I.S.E. (Intervention A)** will be maintained up to four months after the withdrawal of the intervention.

1. Introduction to Results

This stage of the analysis was performed on pairs of data from each experimental group, in two parts: **(i)** from the first follow-up assessment to the second follow-up assessment, four months after the termination of therapy; **(ii)** from baseline assessment to the second follow-up assessment. The first analysis was done to examine the rate of change in the three months after the first follow-up. The second analysis was done to see if engagement levels had reverted to their former levels at baseline assessment, four months after the withdrawal of therapy.

Two participants were unavailable at this stage of follow-up assessment in **Group 1,** leaving five participants. One participant was unavailable at this stage of follow up assessment in **Group 2** leaving eight participants.

2. Interpretation of Results

2.1 Relationship Between Type and Direction of Change, and the Intervention

(i) From After One Month to Four Months After the Withdrawal of Intervention:

The overall changes to the levels of engagement for **Group 1** ware not significant, although two important, simple main effects were revealed. There was a significant rise in *self-active* engagement, the early signs of which had been detected in the previous analysis (i.e. Hypothesis 7), and a small decline, although not significant, in *person*

interaction. It would therefore seem that the positive effects of therapy, i.e. a reduction in *self-active*; and growth in *person*, *object*, and *person-object*; are not strong enough to withstand a withdrawal of intervention up to four months.

Similar to **Group 1**, **Group 2** did not show an overall level of significance over the two follow-up assessments. However, simple main effects revealed a significant decline to the *person* engagement, similar to the small but non significant effect seen in the first group.

(ii) From Baseline to Four Months After the Withdrawal of Intervention:

The overall changes are not significant for **Group 1**, thereby indicating that engagement levels have reverted to their former baseline status four months after the withdrawal of therapy. Similarly, the overall interaction for **Group 2** is not significant.

It is perhaps disappointing to note that therapeutic gains were not maintained for a period of four months after the withdrawal of intervention. However, this is also an important result in consideration of the potency of intervention methods with the learning disabled population, i.e. direct and indirect strategies. It also warrants discussion of the question: ***'What causes the maintenance of therapeutic effects?'***. This is germane to the professional role of the Speech and Language Therapist with learning disabled adults.

2.2 Route of Therapeutic Effect and Reason for Change

a) Direct Route of Therapeutic Effect [Intervention to Participant (A to C)]:

It is important to consider the theoretical positions of Sensory Integration Therapy and the role of sensory reinforcement if the results after the withdrawal of intervention are to be explained.

Does Sensory Integration Theory provide an explanation for changes?

Neuro-developmental organisation is a central aspect of Sensory Integration Therapy. The diachronic model of Sensory Integration effectiveness proposed by Tickle (1988), went so far as to identify *'anatomical/physiological changes at brain stem'* in the long-term effects of therapy. This was assumed to facilitate the *'adjustment in cortical functioning'* for the *'development of motor, cognitive and psychosocial performance'*. As Arendt et al (1988a) pointed out, there is no hard evidence of these neurological and

anatomical changes. They referred to the *'neurological theorising'* of Sensory Integration Therapists (1988b) and suggested that the term 'Sensory Integration' represented a hypothetical construct for descriptive purposes (1988a). If neural reorganisation is indeed the central outcome of therapy, engagement behaviours should be more enduring and not subject to quick reversal (Arendt et al, 1988b). Thus the findings of the current study would appear to be inconsistent with the theoretical purpose of Sensory Integration Therapy. Furthermore, exactly how applicable such a theory is to people with learning disabilities whose *'neural integrity may be compromised'* (Arendt et al, 1988b; p. 429) is in question.

What is the relevance of the role of sensory reinforcement?

As Sensory Integration Theory cannot afford a credible explanation for the lack of outcomes maintenance four months after the withdrawal of therapy, the principles of behaviour modification must be reviewed. The potential of D.R.A. procedures to expand the response repertoire of the individual whilst reducing the level of stereotypy has already been mentioned. If the maintenance of therapeutic effects demonstrated at the one month follow-up assessment, can be explained by the extended use of the participant's response repertoire during intervention, which has introduced the participant to the contingencies of reinforcement in the natural environment, why were there no differences recorded in an analysis of the baseline and second follow-up data? One possible explanation is that the participants had reached saturation point and the stimuli that previously attracted their attention no longer possessed the same potency for individuals. Further explanations are to be found in the following section where the effects of the indirect route are discussed.

b) Indirect Route of Therapeutic Effect [Intervention to Significant Other to Participant (A to B to C)]:

Regarding the regression of engagement levels four months after the withdrawal of therapy, to those recorded at baseline, several possible explanations are offered. **Firstly**, that the environmental contingencies were not complex enough (Burke, 1991). The developing response repertoires of participants required the provision of progressively sophisticated interaction opportunities. **Secondly**, that the staff had insufficient skills and confidence to make ongoing decisions regarding the level of complexity presented to the participant's to meet their needs. This would be consistent with the findings of McLeod

et al (1995) who observed that staff participants lacked the confidence to implement the new skills they had been taught on a training course. In the current study, the confidence factor was dealt with whilst the interventions were still running. The therapist provided an ongoing model for the demonstration of interaction strategies, thereby providing frequent confirmation for the staff members. **Thirdly**, that during the course of the intervention, therapy sessions provided a forum for deciding on and implementing adjustments to the programmes of individuals. Thus it was not the sole responsibility of the staff but was guided by the skills of the lead therapist. **Finally**, that the withdrawal of the therapist's time for a period longer than one month after the termination of therapy, negatively affected both the confidence and motivation of the relevant personnel. Similar to their clients, the staff members required feedback on their interactions with the participants, and new ideas for engagement activities. In short, their skills needed to be re-affirmed and their motivation, re-captured.

Is the permanency of the changes in engagement levels dependent on the provision of environmental contingencies?

There would appear to be a mutually dependent relationship between the participant's response repertoire and the provision of appropriate environmental contingencies. As one changes so does the other need to reflect this, i.e. as the learning disabled person produces more sophisticated responses so the demands of the environment should increase. The role of the staff members is considered to be crucial to the provision of appropriate changes in interaction opportunities, together with the therapist who has the professional skills to advise the ongoing process.

c) Interaction of Direct and Indirect Routes (A to C and A to B to C):

The mutually dependent relationship between the participant's response repertoire and the provision of appropriate environmental contingencies has been established. If this is indeed true, the interaction of the direct and indirect routes of therapeutic effect must be applicable throughout the analysis of the results. What exactly is their relative importance cannot be concluded from the results of the current study, but will be explored in the critique of the study in the final chapter.

3. Group as a Factor

There was no difference between the groups at this stage of the analysis. Reversal of previous gains occurred in both **Group 1** and **Group 2** in a comparison of baseline assessment and the results of four months after the withdrawal of therapy.

4. Summary of Hypothesis Eight

The data do **not** provide support for the eighth hypothesis. The positive effects of the **I.S.E. (Intervention A)** were not maintained up to four months after the withdrawal of the intervention and little differences existed between the two experimental groups.

It is disappointing to observe that therapeutic outcomes were only maintained up to one month post withdrawal of therapy, and that by the four month follow-up assessment, participants had reverted to baseline engagement levels. This may be to do with the important influence of significant others in relation to the maintenance of therapy outcomes. This would be consistent with the view of Calculator and Bedrosian (1988) who stressed that carer involvement in interventions was crucial to the success of outcomes.

The current study involved staff members in the running of the intervention sessions, yet this was insufficient to maintain outcomes beyond one month after the withdrawal of the professional input. A number of reasons for the regression of participant engagement levels have already been suggested. It would appear that there are certain key issues that warrant the attention of the therapist. Strategies need to be developed for: the re-motivation of significant others after the ongoing professional input has been withdrawn; the maintenance of confidence in the independent use of learned skills; recapitulating and redefining the goals of therapy. This may take the form of a less frequent but regular contact between the therapist and keyworker in order that the effects of the actual intervention are maintained.

These issues may have major implications for the strategic working practice of the Speech and Language Therapist with the learning disabled population. This being a fairly static client population, where total remediation of difficulties is not a viable outcome, **episodes** of professional input are frequently identified, i.e. staff are trained in communication skills over a set time period; and a therapy group is convened for a

contracted number of sessions, etc. It is recognised that any one client may receive a number of separate therapy episodes over the years. The reason for this *episodic* approach is that no new referrals could be added to a caseload from which no one is discharged, and that there should be a transfer of skills from the therapist to the client's communication environment. Therefore, detailed consideration of maintenance strategies is required for the time outside the episode of professional input.

In summary, the findings of the current study would seem to indicate that the positive outcomes of an intervention strategy with learning disabled adults that involves significant others as individual helpers, are not sufficient to maintain gains for longer than one month after the termination of the professional input. Thus, the Speech and Language Therapist would be well advised to follow up such an intervention with a programme of staff supervision, to include monitoring and appraisal, strategic adjustment to recommended activities and recapitulation of newly learned techniques. This will be discussed in the final chapter regarding the implications of the current study for the future work of the Speech and Language Therapist.

7.2.9 Summary of Discussion

The discussion of the results has focused on the eight experimental hypotheses. The findings of the current study have been interpreted regarding the potential routes of therapeutic effect in order to explain the process of change: the direct route to improved participant responding; the indirect route focusing on environmental influences and contingencies; the interaction of both the direct and indirect routes. The relevance of the theoretical framework of Sensory Integration Therapy has been critically reviewed, together with the role of sensory reinforcement. The issues of sensory reactivity and contingent reinforcement have also been explored. Where possible, the results have been related to other documented research that has employed the use of sensory-based techniques. Their limited relevance to the current study, with its specially developed intervention (**I.S.E.**) has been stressed.

1. Placebo Effects?

Central to the discussion are the reasons for the therapeutic effect of the **I.S.E.** condition. What is it about its construction that has effected change in the engagement levels of the learning disabled participants? Obviously, simple maturation is ruled out.

The experimental intervention took place over a period no longer than six months including the changeover point between assessments. The placebo effects of **Intervention B: A.P.,** whilst effecting an initial decline in non-purposeful engagement has not produced significant gains in purposeful engagements. At some stages of the analysis, it has even appeared to effect a regression in the gains from the previous episode of **I.S.E.** intervention. Therefore, the provision of extra attention was not solely responsible for the changes in participants' engagements.

2. Improved Sensory Integration?

The validity of the intervention termed the 'Individualised Sensory Environment' has been proved in the short-term, in that its effectiveness has been measured against the changes in participant engagements. Its effectiveness in the long-term, i.e. beyond the one month follow-up, has not been proved. The relevance of Sensory Integration Theory to the findings of the current study has been debated at the various stages of the discussion. There is no evidence that therapy has produced internal changes to the central nervous system that can be directly related to improved performance. The comments of Arendt et al (1988b) are reiterated: if neuro-developmental organisation (i.e. the goal of Sensory Integration Therapy) is the central outcome of therapy, engagement behaviours should be more enduring and not subject to quick reversal. Thus the findings of the current study would appear to be inconsistent with the theoretical purpose of Sensory Integration Therapy. Furthermore, the relevance of such a theory to people with learning disabilities is considered doubtful. The explanations afforded by Sensory Integration Theory regarding neural plasticity, synaptic enrichment and re-organisation of the brain mechanisms are therefore rejected in the context of the current study.

3. Sensory Reinforcement?

The use of contingent reinforcement similar to a behaviour modification approach, i.e. differential reinforcement of alternative behaviour (D.R.A.), proffers one explanation of therapeutic gains under the **I.S.E.** intervention. Response repertoires were established or expanded by tackling the motivation of participants. Systematic decisions were taken regarding the reinforcement preferences of the individual. Thus, participants were helped in their discrimination of environmental stimuli by their expanded response repertoires facilitated in the intervention. It could be said, there was a transfer of effect from the

therapy session to the natural environment. The relevance of the effects of sensory reinforcement is acknowledged in the context of the current study, but not alone. The relationship between the significant other and environmental contingencies is stressed.

4. Role of Significant Others?

The role of significant others has been defined by the indirect route of therapeutic effect. The skills to observe client responses, to modify social interaction opportunities, to adapt equipment presentation and use, and to provide contingent reinforcement, were components of the **I.S.E.** intervention. Staff use of these skills may have effected therapy outcomes and their maintenance up to one month after the withdrawal of therapy. Therefore, the indirect route of therapeutic effect is considered in tandem with the direct route in the context of the current study.

5. Conclusion:

The **I.S.E.** intervention has been evaluated, in the current study. The conclusion of this preliminary study into the effectiveness of the **'Individualised Sensory Environment'**, is that **I.S.E.** is a valid technique for the short-term gains of the interactive behaviours emitted by learning disabled adults. The significant components of the **I.S.E.** construct have been defined as: sensory reinforcement and reactivity based on tactile and vestibular stimulation; environmental contingencies; individual reinforcer preferences; structured support cues; and significant other involvement. Regarding the maintenance of therapy outcomes, further research is required. This will be explored in the next chapter.

7.3 Review of Research Aims and Objectives

This section discusses how far the research aims and objectives were achieved in the current study. There were four original aims. These were identified as distinct phases within the study. These were: **1. the theoretical phase** (the development of a clinical rationale upon which to base an intervention); **2. the definition phase** (survey of the population for the selection of participants and for a richer descriptive account of characteristics); **3. the construction phase** (the development of the appropriate instrumentation and the running of the pilot studies); and **4. the experimental phase** (evaluation of the effects of the intervention on the interactive behaviours of the sample population). The aims were realised through attention to specific objectives which are now critically evaluated regarding their achievements.

7.3.1 The Theoretical Phase

The initial aim of the project was to develop a theoretical framework for a suitable intervention with learning disabled adults who are not yet intentional communicators, based on a synthesis of four key areas reported in the literature.

1. Theoretical Framework of I.S.E.:

Objective 1.1: To establish a theoretical framework based on a synthesis of the four areas of the literature review: (i) intervention practice with adults with learning disabilities interfacing with current service philosophy; (ii) contingent and non-contingent sensory reinforcement in relation to the learning process; (iii) Sensory Integration Theory; and (iv) Sensory Integration Therapy (Ayres, 1972; 1979).

A theoretical framework was developed and based on a review of four main areas in the literature: (i) intervention practice with adults with learning disabilities interfacing with current service philosophy; (ii) contingent and non-contingent sensory reinforcement in relation to the learning process; (iii) Sensory Integration Theory; and (iv) Sensory Integration Therapy (Ayres, 1972; 1979).

Firstly, service philosophy and practice with learning disabled adults was reviewed. Speech and Language Therapy strategies were divided into direct and indirect techniques. They were inspected for the clarity of operational definitions and outcomes measurement. Secondly, contingent sensory reinforcement was explored, particularly in relation to behaviour modification programmes. The importance of sensory reactivity was highlighted with regard to client responding. Thirdly Sensory Integration Theory and Therapy were critically reviewed. Inconsistencies were revealed in the literature review regarding the precise operational definition of sensory integration therapy and the candidacy criteria. The central goal of Sensory Integration Therapy was considered to be unmeasurable due to the abstraction of its concept, i.e. the underlying assumption of changes in brain mechanisms and C.N.S. processing.

The theoretical framework for the **I.S.E.** intervention represented a synthesis of the relevant areas of the literature review. It was constructed to provide the foundations of the **I.S.E.** operational definition and for the development of the appropriate

instrumentation for the planning of individual therapy programmes and for its implementation.

A five part model to illustrate the theoretical framework of the **I.S.E.** was established, the first of which defined the interconnections amongst all the elements of the model. The second model defined the interactions amongst the C.N.S., the environment and sensations arising from it, and the adaptive responses of the human organism. The third model considered the presence of a learning disability with likely associated impairments, and the potential influence over the interactions amongst environment, C.N.S. and adaptive responding. The fourth model focused on people with a more severe degree of learning disability who were observed to engage in high levels of non-purposeful engagement. The interactions amongst C.N.S. activity, environment and non-purposeful engagement was explored. Finally, the introduction of the intervention and its relationship to the network of interactions was defined in the fifth model. The results of the current study provide initial support for the validity of the **I.S.E.** intervention. This will be addressed in more detail in the final chapter regarding the implications for future work.

2. Operational Definition of I.S.E. Intervention:

Objective 1.2: To operationally define the 'Individualised Sensory Environment' intervention **(I.S.E.)**.

The **I.S.E.** intervention was operationally defined, based on the established theoretical framework. This was summarised in three documents and focused on: (i) **I.S.E.** Programme Planning: Strategic Areas for Consideration; (ii) Group Management Strategy; (iii) **I.S.E.** Group Structure. This was so that the running of sessions, the roles of therapist/individual helper, and ongoing adjustments to intervention programmes, could be executed consistently across sessions and groups. Consistency in the running of the **I.S.E.** intervention was achieved in the context of the current study. the presence of the researcher may also have been a factor. However, the strength of the operational definitions can only be evaluated by its repeated use by other therapists and the clinical audit of its techniques in practice.

7.3.2 The Definition Phase

The second aim was to define the target population (people with learning disabilities who are not yet intentional communicators), in terms of presenting features, to make a comparison with the remainder of the population (people with learning disabilities who are intentional communicators), and to ascertain the type of Speech and Language Therapy interventions currently being implemented. This was termed the **definition phase** of the project.

1. Identification of Sample Population:

Objective 2.1: To identify amongst the study population of people diagnosed as having some degree of learning disability, those who are not yet using symbolic representations in intentional communication acts; who are largely dependent on others for the maintenance of their support needs; and who spend a perceived majority of their time engaged in non-purposeful activity.

The difficulties which have existed in attempts to define the characteristics of those people with profound learning disabilities have already been mentioned. By the generation of a simple Referral Form which focused on just two parameters (purposeful behaviour and intentional communication status), it was possible to identify a sample population. Data was largely based on the keyworker's knowledge of the client. The relevance of information was probably dependent on the experience, qualifications and time in post as the client's keyworker. Although this was dealt with, in part, by a requirement that the keyworker should have been in post for at least six consecutive months, variations in quality of Referral Form completions were observed.

The Referral Form contained opposing statements in representation of each parameter and this enabled the researcher to review poor quality forms with the relevant keyworker by the rank ordering of the two conflicting items, such that both statements could be highlighted for the individual but only one identified as being 'more typical' of the person. This could be viewed as quite a cumbersome strategy. The addition of an integral rating scale for each statement for the weighting of characteristics would have dealt with this more efficiently.

There was some difficulty in the interpretation of the first statement which referred to the communication skills of the individual, i.e. *'The client usually uses spoken words, signs or symbols to communicate with others'.* Several keyworkers considered it to be characteristic of their client if they had one or two symbolic communication acts that were used frequently. However, review of these individuals revealed that the word(s) or sign(s) were frequently not applied meaningfully.

Due to limitations within the staffing structure at the Day Centre, reliability measurements were not completed. However, this was in part dealt with by review of the Speech and Language Therapy caseload at the centre which concurred with the keyworker's judgements.

The Referral Form represented an initial survey tool and did not provide a possible explanation of client behaviour. Its current form has achieved simplicity by the use of just four statements and also provides an internal check in the pairing of two opposing items. However, other causation factors for, or influences on, a person's apparent lack of intentional communication and purposeful behaviour were not dealt with. Examples of factors might be: client time in the centre and familiarity with the people and routines; presence of sensory impairments whether diagnosed or undetected, such as hearing loss; existence of physical disability preventing execution of voluntary action required communication and purposeful activity; emotional factors such as depression, acute shyness, elective mutism (the latter two having already been identified as significant factors in this level of client profiling). Although information on sensory and motor impairments was gathered at the second stage in the identification process of the sample population, i.e. the Case History, it could be argued that it was more appropriate at the referral stage. In short, it seems the Referral Form achieved its purpose in dividing the total population according to the two parameters, but lacked the sensitivity of a more detailed screening device to provide possible explanations for participant status.

2. Comparison Between Two Neighbouring Populations:

Objective 2.2: To compare the study population with a similar population using learning disability services in a neighbouring borough.

A survey of a learning disabled population of similar designation to the study population was carried out. This was to check the representativeness of the sample population in the context of the wider Day Centre population. Only a proportion of the Referral Forms were completed by the staff, the rest being completed by the local Speech and Language Therapist. Therefore, variations were acknowledged to exist in the data collection procedure.

Just how representative the survey population was of the study population was constrained by existing differences between establishments, i.e. the study population had a younger age range than the second survey population which may have a bearing on their different past experiences of community and educational opportunities. This could have been dealt with by surveying only those attendees of Centres for the learning disabled with comparable age ranges.

3. Survey of Speech and Language Therapy Interventions:

Objective 2.3: To gather information regarding the types of Speech and Language Therapy intervention being offered to that population.

Because this research was primarily focused on the construction and evaluation of a suitable intervention, it was considered relevant to acquire information on the type of therapy currently being offered by Speech and Language Therapists in this area of work. However, the simple format compromised the level and understanding of the resulting information. The lack of precise operational definition of interventions has already been mentioned, and this part of the survey posed similar issues in the interpretation of the terminology used by the therapist. It seems likely that termed interventions such as 'basic functional communication' are dependent on local definition and interpretation. Therefore the differences between the variously termed therapies are unclear and the data's collective importance perhaps only lies in its commentary on the lack of precisely defined therapies in use with this population. Similarly, the expectations of the therapist

could be said to represent 'internal judgements' rather than a formulated hypothesis based on the proven efficacy of the identified intervention. In short, therapist expectations were not necessarily based on clear objectivity.

4. Multi-Axial Comparison Between Remainder and Sample:

Objective 2.4: To survey and recount the distinctive features of the sample population in a multi-axial descriptive comparison with the remainder of the study population.

A survey of all clients attending the focal Day Centre for the study, was conducted in order to further delineate the sample population. Its central aim was to identify the characteristics of those participants who did not meet the entry criteria for the experimental phase of the project, in comparison with those who did. The implications for the main study were summarised after each area in the Case History, particularly with regard to understanding the sample population, and identifying issues to be strategically dealt with in the intervention.

Multi-axial information was obtained from existing casenotes on individuals in the study population: social service files, school medical records and current Speech and Language Therapy casenotes. This was collated by the use of a constructed Case History utilising a coding frame for ease of interpretation. As such, the accuracy and quality of the information was largely dependent on what information had been recorded by others, the date of entry and therefore its relevance to the present status of the participant. The information was extracted by the researcher. This may have influenced its resultant accuracy or immediate relevance to the participant, because the researcher was possibly ignorant of the historical significance of documented entries.

Keyworker's perceptions were invoked in ascertaining the presence and severity of problem behaviours. In order to tackle the issue of time relevance of casenote entries, it may have been more advantageous to access the various records **through** the keyworker, either for their familiar interpretation or else in order that commentaries could be made on each entry's relative accuracy.

The penultimate section of the Case History (i.e. frequency and severity of problem behaviours) could have been expanded in terms of its detail and the rating scales it employed, so that the perceptions of significant others could have been monitored for shifts at any or all of the assessment points of the project. Further discussion takes place when *Objective 3.2* is addressed.

7.3.3 The Construction Phase

The third aim of the research was to develop appropriate instrumentation for the purposes of assessment and individualised intervention planning, and to pilot the procedures in a feasibility study. This was termed the **construction phase** of the project.

1. Standard Schedule for Clinical Decision-Making:

Objective 3.1: To develop a standard schedule whereby clinical decisions are structured for the operationalisation of the programme of intervention termed 'Individualised Sensory Environment' **(I.S.E.)**.

A schedule for the clinical decision-making was developed. It focused on first level decisions for each participant's entry to therapy. These decisions included the identification of: (i) the response repertoire of the individual; (ii) the appropriate support cues to facilitate responding behaviour; (iii) the individual preferred sensory reinforcers; (iv) the components of the interaction, i.e. *person*, *object* or *person-object.*

Although the schedule clearly provided a standard method by which participant's programmes were initially defined, it did not incorporate all the decisions that were vital to the therapy process, many of which had to be taken during the actual running of the programme. These were decisions relating particularly to: (a) the interaction response level which defined whether a participant would work within a the one to one situation or in a pair; (b) the degree of social participation regarding the participant's orientation to staff and peers within the group's dynamics; (c) the environmental specification for each participant regarding furnishings and space requirements; and (d) the degree to which an individual was able to demonstrate choice, turn-taking and joint attention, all of which have a bearing on the above. In summary, the original schedule observed the

individual participant's responses in a one to one situation thereby ignoring the important social interactions within the group setting.

This deficiency in the Decision-Making Schedule was partly dealt with, by the use of a standard log sheet, not only for the recording of participant achievements on a sessional basis, but also for ongoing clinical decisions regarding programme adjustment. However, future development work regarding the operational definition of the **I.S.E.** might advisedly explore the construction of a second level of decision-making, which might be carried out over the first two sessions of the planned episode of intervention, and in the presence of at least one other participant. This would insure that the decisions were indeed made, but also that process was consistent across all participants.

A second limitation of the schedule was that it did not formally consider the presence of additional sensory impairments in its applications, thereby seeming to severely restrict the response opportunities offered to various individuals. This is particularly relevant regarding the presentation of sensory items and the hierarchy of support cues offered. Adaptations were made to the schedule, and in therapy, for those participants with hearing impairments, in the form of visual or tactile cueing to augment the standard cues offered. However, the need for clear decisions regarding augmentation is required, particularly for the more widespread implementation of the **I.S.E.** intervention.

Finally, it could be said that the established order by which stimuli were presented could have influenced participant responses to the situation. The first part of the schedule, introducing person engagement, was a planned order so that a desensitisation to tactile contacts could be observed. This was favoured over a randomised order for dealing with the possible existence of the domain 'tactile defensiveness' (Royeen, 1985). The second part, focusing on object engagement, ordered items arbitrarily but within similar object groups such as 'sensory trays'. Future work on the ordering of items might actually attempt a comparative examination of the planned order and a more randomised one, for their individual effects over the participant's responses. The reliability of the response repertoire checklist was proved.

2. Keyworker Interview:

Objective 3.2: To develop a structured interview with keyworkers for quantifying their perceptions of the interactive behaviours of the participants.

The difficulties regarding the development of a structured keyworker interview have already been recounted in the section on pilot studies (**Chapter 4**). Briefly these related to poor reliability of measures which may have related to variations in staffing within the Day Centre. For these reasons, and others which were due to the concise realisation of the objective behind such a measurement, i.e. what was the purpose of such a measurement and what changes were expected, the data resulting from the questionnaire was not used in the main study. The issue of 'Keyworker Interview' will be dealt with in the critique of the current study and the implications for future work in the final chapter.

3. Categories of Engagement:

Objective 3.3: To generate a categorical description of the focal engagement behaviours concentrating on the constituents of: self, person, object and person-object for use in a momentary time sampling schedule.

Categorical descriptions were developed whereby behavioural characteristics that were considered to be broadly similar, were grouped together. Three of these were based on the identified constituents of the interaction: *person*, *object* and *person-object*. Three focused on independent engagement states of 'self' in terms of *intimate, neutral* and *active*. The final category *'out of view'* was generated in order to deal with partial or total eclipses of the observer's view. Engagement categories utilised the same structure for ease of access to observers.

A set of observation rules was created to define the degree of mutual exclusivity between categories. Where the participant was observed to engage in both *self-active* and one of the three constituents of an interaction, i.e. *person, object* or *person-object,* a separate category was not generated, instead the observer was required to mark both sources of engagement as occurring simultaneously. For the purpose of giving a raw score for the engagement at any particular moment, the maximum score of '1' was divided in half and assigned to both categories (0.5 each).

Reliability measures were taken such that there were two individual observers assessing each focal participant throughout the study apart from at the two follow up points where a lack of staff funding and resources made this impossible. To deal with this, the raw data derived from the observer present throughout the study (i.e. the researcher), were used for the analysis when comparing baselines with follow up measurements.

It was originally intended to use video equipment as the recording medium for subsequent observations. This would have provided greater opportunities for the study of reliability. However, the difficulties concerning space and angle of camera lens have already been identified in the discussion of issues arising from the second pilot study. Therefore, observations were completed *in situ* allowing for the essential flexibility of the observers' location in the environment in relation to the focal participant, and for dealing with cramped, and frequently crowded conditions within the Day Centre. It ultimately reduced the labour time of the observers, in that recording and coding of participant interactions occurred simultaneously as opposed to sequentially.

4. Pilot Studies:

Objective 3.4: To pilot the instrumentation and to run the intervention in order to appraise the feasibility of the experimental procedures.

Two pilot studies were run. The first, **Pilot Study 1**, was carried out to check the feasibility of the assessment and intervention methodology. It revealed a number of issues that needed to be addressed in the main study. The second, **Pilot Study 2**, was unplanned. It achieved its status as a second pilot because of issues regarding the implementation of the interventions and compliance with the recommended frequency. Final adjustments to the experimental design of the main study were made prior to its execution.

7.3.4 The Experimental Phase

The final aim of the study was to implement the intervention with a sample population in order to evaluate its effects. This was termed the **experimental phase** of the project.

1. Clinical Decision-Making:

Objective 4.1: To apply the standard clinical decision-making schedule to the relevant participants. To quantify the potential engagements of each participant during a structured session of controlled sensory stimulation, and to make local decisions for their entry into an intervention schedule.

The clinical decision-making schedule was carried out with each participant prior to his/her entry to the **I.S.E.** intervention. These were recognised to be first level decisions regarding: (i) the response repertoire of the individual; (ii) the appropriate support cues to facilitate responding behaviour; (iii) the individual preferred sensory reinforcers; (iv) the components of the interaction, i.e. *person, object* or *person-object.*

However, second and third level decisions were also required. Second level decisions were necessarily taken once the participants had started to attend the therapy groups. These were decisions regarding: interaction response levels (i.e. level of input from therapist to participant - one to one, pair, small group); group dynamics (i.e. degree of social participation with peers and staff); presentation specifications of stimuli regarding choice, turn-taking and joint attention; and sensory contact details. The use of space and furnishings was dealt with by gaining the appropriate advice from the Physiotherapy service, i.e. appropriate seating and positioning for individuals. The third level of clinical decisions was with regard to the frequent programme adjustments to consecutive sessions. Decisions were guided by the use of a structured therapy log sheet that identified individual components of the intervention for recording progress and identifying areas of change **(Appendix C6).**

Further development work is required in order to construct a standard, second level of clinical decision-making to insure the objectivity and consistency of the intervention. The clinical decisions need to be construed such that levels of turn-taking or choice could be identified for individuals. This would result in the provision of modified opportunities

along a gradient for the facilitation of response changes, i.e. choice of stimuli presented in a pair, then a group of three, etc. As well as maintaining the consistency of the intervention, this would add to the objectivity of the continuous narrative records.

2. Running I.S.E. and A.P. Interventions:

Objective 4.2: To run the intervention with the sample population and to alternate it with an attention-placebo condition **(A.P.)**.

The interventions were delivered in small groups within the centre's team bases. The involvement of the researcher was not ideal and was borne out of necessity due to a lack of additional funding for another therapist. In order to minimise the researcher's bias, the researcher assumed the role of lead therapist responsible for the group management. The significant others were assigned to the role of individual helper. Room management techniques were reviewed and adapted to suit the therapy group environment. This enabled the centralisation of ongoing decisions during therapy sessions, such that, equipment was moved, times were monitored, attention amongst participants was equally shared, and key recommendations for individual programmes were demonstrated to individual helpers for their consistent application. This was similarly interpreted for the attention-placebo therapy sessions.

One issue might have been the significant other belief in the potency of the interventions. To deal with this, the attention-placebo condition was presented as credible alternative to the **I.S.E.** intervention and was termed 'Action-Performance' Therapy. It was presented as a structured therapy, utilising some functional and some novel, equipment in its activities. The individual helpers were kept naive of the true hypotheses of the project.

3. Measurement of Engagement Levels:

Objective 4.3: To ascertain the proportion of time each participant typically spends engaged with: *self; person*; *object*; and *person-object.* To achieve baseline measurements of participant interactions and to repeat those measures between the alternating interventions at the defined points in time and at two follow-up points.

Data collection proved to be a labour intensive exercise that required large amounts of the researcher's time as one of the two observers. Use of portable recording devices loaded with M.T.S. software, such as an event recorder, would undoubtedly have reduced the time required for the processing of information, both in terms of producing hard copies of category scores and summarising the reliability measurements. However, this resource was not available to the researcher at that time.

Ideally, the researcher, with a knowledge of the experimental hypotheses should not have been involved in the assessments, although the assistant was ignorant of the true purpose of the research. For future studies the non-involvement of the researcher in the assessment process is recommended, in order to control for potential influences born out of research expectations.

The assessments in this study examined the engagement levels of the sample, quite independently of environmental events, including the behaviour of significant others and participant peers. The antecedent circumstances of participant responses and their consequences were therefore ignored. This has served to severely limit how far the potential route of the **I.S.E.** therapeutic effect may be critically discussed. In short, there was a lack of environmental information which may have affected participant responding and influenced changes in engagement levels. The literature review pointed out the weakness in the Sensory Integration model of therapy, in that it ignores the role of the environment. The current study, whilst acknowledging the role of environment in the theoretical framework for the intervention **I.S.E.**, did not include the significant other as a second and necessary dimension of the assessments of the dependent variable, (the other one being the measurement of participant engagements). Only with its inclusion, can the discussion attend to the interaction of the two routes of therapeutic effect. This will be discussed further in the critique of the study in the final chapter.

4. Discussion of Results:

Objective 4.4: To discuss the results in relation to the experimental hypotheses and to the literature reviewed.

The experimental results have been discussed in relation to the findings of other studies where sensory stimulation has been a key factor. Because of the unique intervention used in the current study, precise equations with similar studies have been limited. The various theoretical positions, i.e. Sensory Integration Theory and the principles of sensory reinforcement in behaviour modification, have been reviewed in the context of the research findings. Sensory Integration Theory was rejected as a possible explanation of change to participant engagement levels. The principles of sensory reinforcement in behaviour modification were evaluated to be relevant to the results together with the role of significant others, i.e. the indirect route of therapeutic effect. In short, an interaction of the direct route of sensory reinforcement and environmental contingencies and the indirect route of significant other use of new skills to create appropriate social interaction opportunities, was considered to be the most likely explanation.

7.3.5 Summary of Aims and Objectives

The four central aims of the current study have been reviewed. They have been represented by separate phases of the study: (i) the theoretical phase; (ii) the definition phase; (iii) the construction phase; and (iv) the experimental phase. Their specific objectives have been appraised regarding the level of achievement and any issues that arose during the course of the project. Where certain strategies were invoked to deal with the difficulties, they have been outlined. Other strategies of relevance to future work in this area have also been mentioned.

7.4 Summary of Chapter

This is the penultimate chapter of the thesis. The first part has provided a discussion of the results in stages, which relate to the experimental hypotheses. The findings have been discussed in the context of other studies where there may have been similarities in their use of sensory stimulation and objectives of therapy, i.e. reducing maladaptive behaviour. Their limited relevance to the current study has been pointed out. Possible explanations for the changes in engagement levels have been explored. The limitations of Sensory

Integration Theory have been critically reviewed in the context of the results and finally rejected as a viable explanation of therapeutic effects. The principles of sensory reinforcement and sensory reactivity have been acknowledged to be possible agents of change, together with the changing role of significant others regarding attitudes and interactive behaviours with the participants.

The second part has reviewed the original aims and objectives of the current study in the light of achievements and presenting issues. The next and last chapter of the thesis, moves onto a critique of the current study with the implications for future work.

CHAPTER 8:
CRITIQUE OF RESEARCH AND IMPLICATIONS FOR FUTURE WORK

8.1 Introduction to Chapter

This is the concluding chapter of the thesis. It is divided into two parts. The first part provides a critical review of the current study and highlights recommendations for future research. The second part discusses the implications for future work, both in terms of operational policies in adult learning disability services and the practical significance for the Speech and Language Therapist.

8.2 Critique of Research

The critique of the research examines the selection of participants; the assessment methodology; the intervention phases; and the statistical analysis of the current study. Some issues regarding the instrumentation developed for the current study have already been dealt with under the review of the appropriate objectives in the second part of the previous chapter.

8.2.1 Selection of Participants

1. Method:

The sample population included those learning disabled adults within a Day Centre who were not yet intentionally communicating (i.e. defined in the current study by their lack of use of symbolic references such as words, signs or symbols), and who typically engaged in non-purposeful activity. A Referral Form was constructed to identify appropriate participants for the study focusing on two parameters: intentional communication status and purposeful activity. The Referral Form contained opposing statements representing each parameter, i.e. *"Client uses spoken words, signs or symbols to communicate with others"* was in opposition to *"The client's personal needs are usually supplied and anticipated by others"; " Client usually engage(s) in purposeful activity of own accord, which is either goal or person oriented"* was in opposition to *"Client usually engages in non-purposeful activity which is not goal or person oriented and may be repetitive or stereotypic in nature".*

Future work regarding the Referral Form might consider the use of an integral rating scale for each statement for the weighting of characteristics. This would deal with clients who display ambiguous characteristics within one parameter, i.e. they variously engage in levels of both non-purposeful and purposeful behaviour. The addition of a rating scale in place of the simple tick system, would allow the keyworker to differentially rate each characteristic behaviour in relation to the individual, such that the degree of non-purposeful behaviour to purposeful could be weighted. In short, it removes an enforced choice of opposite ends of a parameter, and acknowledges the more likely continuum of characteristic behaviours. This might also reduce the administration time required to review Referral Form completions where opposite ends of a parameter have both been identified as characteristic of the individual. However, the inclusion of an integral rating scale may compromise both simplicity of the current format and the resulting reliability.

Three participants had to be excluded from the sample population due to either an alternative diagnosis, e.g. elective mutism, or else due to other reasons, e.g. one participant had only just started at the Centre and was very shy. Any future work needs to be aware of the limitations of the Referral Form. It should be viewed as a primary device to separate the defined sample population from the remainder. However, it lacks the sensitivity and detail of to provide possible explanations for participant status such as alternative diagnoses or additional sensory of motor impairments that may be critical factors, e.g. hearing loss; visual impairment, etc.

2. Reliability:

The current study did not investigate the reliability of the sampling procedure. This was due to the lack of a second, available significant other who was also familiar with the focal client. One measure that could have been taken was asking each keyworker to fill in a second Referral Form on the same client at least one week later. This would have examined the reliability of the Referral Form completion. Furthermore, should future work involve the use of an integral rating scale for each statement, measures of reliability would be vital, particularly in cases where there is some ambiguity regarding the characteristic.

3. Size of Sample:

The current study focused on the more severely learning disabled adults who were presenting as *non-communicating*. These represented a smaller proportion of the Day Centre population, thereby limiting the size of the sample. The sample originally numbered twenty-one participants but due to a sudden death, the withdrawal of one from the Centre and the quarantine of another who had chicken pox, the sample was reduced to eighteen. The change in the personal circumstances of two of the participants (e.g. who both had a diagnosis of autism) further reduced the sample size to sixteen.

A larger sample population would have provided further validation of the intervention (**I.S.E.**). Furthermore, if the sample population had been composed of participants from at least two different settings, e.g. separate Day Centres, there would have been greater facility for extensions to the experimental design and methodology. This will be discussed under the appropriately named section.

There were variations amongst the participants who made up the sample population. There was a higher level of *self-neutral* engagement in **Group 2** than in **Group 1**, who had a higher level of *self-active*. The selection procedure of the current study did not distinguish between these varying characteristics. This means that, whilst the sample population shared the features of non-purposeful behaviour and severely restricted communication skills, other factors were present that may have influenced the results. Future work might look at an increased sample size that uses proportionate sampling techniques so that the proportions of people in the sample (i.e. higher *self-neutral* or higher *self-active* engagement) are reflected in the composition of the experimental groups. This would allow for a more detailed investigation of the participants and even draw some clear conclusions regarding a recommended candidacy profile for the **I.S.E.** intervention. For the future application of the therapeutic model and the establishment of its validity with the specified population, it would seem prudent to re-examine the candidacy in the light of the mentioned differences.

4. Other Populations:

There are other populations for whom this area of work, i.e. evaluation of **I.S.E.** intervention, may be appropriate. The current study was unable to complete its investigation with two participants who had a diagnosis of autism. The severe nature of communication development together with their restricted social skills and high levels of stereotypic behaviour, make them potential candidates for the intervention. However, due to the unique nature of their collective characteristics, specific adjustments to current instrumentation and operational procedures are likely to be required. Examples of this might be: the setting of the therapy whether group of individual; the frequency of contact; etc. In order to explore the usefulness of **I.S.E.** with autistic people, a single case study approach is recommended.

8.2.2 Experimental Design

1. Experimental Design:

The running time of the experimental phase of the current study was restricted due to the reorganisation of the day service's structure. Plans had been made for the introduction of part time attendance for some clients and the dispersal of others to satellite centres within the borough. This information was not widely available at the commencement of the project and naturally altered the research design both in terms of its duration and also its number of alternating treatments. It was originally planned that each experimental group would receive two phases of each type of therapy in reverse orders (**Group 1:** ABAB; **Group 2:** BABA). However this was not possible in the context of the Day Centre's impending changes. Therefore the last phase of intervention had to be withdrawn.

This has restricted the evaluation of the therapeutic effectiveness of the **I.S.E.** intervention and the type of comparisons made between the two experimental groups. In particular, the effects of a second phase of **I.S.E.** intervention over the situation and the potential influences of therapy order were limited, i.e. *'Would **Group 2** have responded similarly to a second episode of **I.S.E.** intervention?'*.

Therapy groups comprised participants who were members of the same team base within the Day Centre and team bases were formed according to the residential location of the clients

within the borough. The differences that existed regarding baseline characteristics of non-purposeful behaviour have already been mentioned. The experimental design and the setting constrained the way the experimental groups were formed. Future work might focus on the different candidacy profiles, as defined by their baseline engagements of *self-neutral* or *self-active*, for the more specific evaluation of the **I.S.E.** intervention effectiveness and the amenability to change of each type of engagement.

2. Placebo Condition:

Because the study was undertaken as part of a Speech and Language Therapy service to a Day Centre, the denial of intervention to a 'control' group was not feasible. The current study therefore utilised a placebo condition to control for the effects of extra attention to the participants. The placebo condition was represented by an alternatively named intervention: 'Action-Performance' Therapy. This was so that the intervention was credible to the significant others who were involved in the delivery of therapy. However, in the pursuit of a credible alternative, the purpose of the placebo condition as a control for the experimental condition may have been compromised. That is, the attention-placebo more represented a competing therapy than a placebo condition. Furthermore, some of the response demands of the placebo activities and equipment were too complex for the participant's skill sets which may have negatively influenced engagement levels. This is particularly true of the first two or three activities which required the demonstration of sign/word comprehension and sign imitation in relation to a set of familiar objects. Although the use of support cues insured that some level of response was always attained, their usage did not guarantee that the response had meaning for the individual, i.e. it was an accurate reflection of skill set.

Future work using a similar design might involve the use of activities that are known to be within the capabilities of the individual. This might be done by using the recommendations of the keyworking staff and videoing the participant engaged in the activity prior to the running of intervention sessions, in order to establish the procedure for the placebo condition. An extended run-in period to the intervention would have allowed for the identification and selection of appropriate activities and equipment for the individuals concerned. This would

neutralise the effects of inappropriate task demands on participants and minimise the issue of a competing therapy.

3. Role of Therapist:

Due to the constraints of time and resources available, the researcher was required to be instrumental in the running of the intervention sessions, i.e. the **I.S.E.** and the **A.P.** This was not considered ideal as the natural bias of the researcher could have exerted an influence, no matter how subconsciously, over the outcomes of therapy. The researcher assumed the role of 'group manager' in both conditions to control for any potential effect. The significant others acted as 'individual helpers' to the participants. However, it is acknowledged that only a total lack of involvement in the actual intervention process and the training of other Speech and Language Therapists would adequately control for the "researcher as therapist" effect. It is therefore recommended that a future research initiative employs a therapist who is naive to the hypotheses of the study.

4. Follow-up Assessments:

Follow-up assessments were planned at one month and four months after the termination of therapy. Therapeutic effects were shown to endure up to the one month follow-up but not at the four months follow-up. This leaves the question regarding *'Exactly how long therapeutic gains were maintained after the withdrawal of therapy?'*. The distance between the two follow-up assessments is considered too long to detect the rate of change. This might be better dealt with by monthly follow-up assessments, up to the point at which there is no significant difference between follow-up engagement levels and those at baseline. Furthermore, the reason for the deterioration of engagements to their former levels at baseline is not clear from the results. One possible explanation was that the withdrawal of the therapist's time for a period longer than one month, negatively affected both the confidence and motivation of the relevant personnel. It was acknowledged that the staff members required feedback on their interactions with the participants, and new ideas for engagement activities. Future research might incorporate the use of a follow-up programme to one half of the sample population. It would be designed to re-affirm and maintain the

skills of significant others and to preserve their motivation. Thus one group would form the control for the introduction of the follow-up strategy to the other.

8.2.3 Methodology

1. Independence of Measures:

Momentary time sampling was the chosen method of assessment. Categories of interactive behaviour were defined based on the informal observations of the researcher and a review of the literature. The use of a 10 second interval proved to be reliable and the 3 second lead in to the moment to be sampled, allowed for the appropriate coding decision to be made by the observers.

Unfortunately, due to the limited resources available to the project, the researcher was also one of the observers. In order to limit the potential influence of the researcher over the assessments, a second observer was available at each assessment apart from the two follow-ups. It is recommended that future research should employ two independent observers, both of whom should be naive to the purpose of the research. The role of trainer in the assessment method could then be assumed by the researcher to assure both the consistency and the detail of the approach. This would insure the independence of the measures from the method of intervention, thereby rendering them truly objective.

2. Recording Medium:

The recording medium was a checksheet and pencil method. This had been favoured over the use of video recording for later analysis for a number of reasons, amongst which were: use of video limited the observer's view to the frame of the camera; it was time consuming to record and code on separate occasions. The 10 second intervals and 3 second delays were signalled by bleeps recorded on an audio tape played through ear phones to each observer. The use of this method, whilst proving quicker than the use of video, was also time consuming. Engagement levels and agreements had to be manually calculated after each observation period. It is recommended that future use of the assessment method (i.e. M.T.S.) utilises appropriate technology for accuracy and efficiency in data collection and analysis. Naturally, extra financial resources need to be made available. The Tizard Centre at

Kent University has produced appropriate software for momentary time sampling procedures, that involves the use of a hand held computer for the inputting of codes and for the collection of data. This has the facility to analyse data and to identify agreement levels. It may also be linked to a printer in order to produce hard copies of the data.

3. Categories of Engagement:

The current study used seven categories of engagement. Two of the categories did not represent outcome measures, but were defined for the management of the assessment process. These were *self-intimate* and *out of view*. The problem was that the amount of real observation time was compromised by the focal participant removing him/herself into a designated *self-intimate* area, i.e. the toilets, or else by being *out of view*, as these engagements were included in the overall observation time. It was thought that the amount of time this represented regarding the total moments sampled, would be similar for all participants given the random scheduling of observations. However, it is clear from the tables of results that one or two participants did in fact spend longer in *self-intimate* designated areas. The reason for this is unclear although one participant was reported to engage in stereotypic behaviour in the toiletting area. Other researchers have dealt with this issue by recording it as 'time out' (Martin and Bateson, 1986). That is, the observer continues to record the activity to the category but makes up for the 'time out' by adding on the necessary time to the observation period, thereby achieving maximum observation time for all participants. The use of 'time out' is recommended in future use of the assessment method to neutralise the effects of *self-intimate* activity.

4. Quantity Versus Quality of Measures:

The assessment methodology focused on the engagements of the participants. The settings of the observations had been specified and certain times were excluded from the schedule. Their exclusion was based on their potential influence on the types of engagements because of the purpose of the setting i.e. mealtimes; watching television, or else on the coding frame provoking ambiguities, i.e. music sessions: *'Is the participant dancing or rocking stereotypically?'*. The main dimension of measurement was duration which was indicated by

the proportion of moments the participant spent in the different engagements. In short, it measured the **quantity** of interactions as defined by the engagement categories.

Two issues have been highlighted regarding the chosen assessment methodology. Firstly, that the **quality** or complexity of those engagements has been ignored. Future work might look at expanding the categories to reflect the quality of responses. Obviously, this would mean the expansion of the coding frame which in turn might compromise its degree of reliability, i.e. the more coding decisions there are, the greater the space for coding errors. Therefore, the levels of complexity would have to represent behaviours that were easy to distinguish from each other, e.g. the participant engages in *person* contact by: a referential communication form such as an iconic gesture or a word; a conventional gesture, etc. In order to establish a reliable and accessible coding frame that incorporates the dimension of quality as well as quantity, some detailed development work is required. It should involve video sampling to generate the categorical levels and a review of the literature on child development, followed by pilot studies to check the reliability of the new coding frame.

Secondly, the immediate context of participant responses was not measured in the current study. That is the antecedents and consequences of their responding behaviour was neglected. This has been referred to as 'Antecedent-Behaviour-Consequence' (A.B.C.) observations. This method has frequently been used in the functional analysis of problem behaviour (Jones et al, 1995). However, the recording of antecedents and consequences would provide valuable qualitative information to: not only **(i)** the measures of participant responding; but also to **(ii)** the behaviour of significant others. The importance of the latter will be explored in the next section. Regarding the measures of participant responding, analysis of antecedents would indicate at least one level of complexity in the participant's responding **(i)**, i.e. whether the measured behaviour represents a response to a significant other stimulus, or whether the interaction has been initiated by the participant. Another level might be the difference between the antecedent and the participant's behaviour, e.g. *'Has the participant produced a new or extended behaviour or is it simply an imitated response?'* The use of an extended coding frame which incorporates the response quality dimension and

the antecedents of the behaviour will necessarily require major development work, more detailed training for observers and a carefully planned method of analysis.

5. Route of Therapeutic Effect (Direct or Indirect?):

The current study, whilst it has considered the changes to significant other behaviour as a result of the intervention in the discussion of findings, it has focused its evaluation method on the responding behaviour of the participants. It has been pointed out that the significant others were involved as 'individual helpers' in the interventions and as such learned a number of new skills for working with the sample population. The importance of significant others in assuming responsibility for the *learning* of the learning disabled person has also been stressed (Calculator and Bedrosian, 1988). However, the current research failed to measure the effects of the interventions on staff responses to participants outside the therapy sessions. This is particularly important, in relation to the maintenance of therapeutic effects and the relevance of environmental contingencies.

The question of major interest to potential practitioners is: *'Which route(s) of therapeutic effect is the strongest?'*. When this question has been answered, a proforma for intervention practice can be devised. The assessment of significant other behaviour, including antecedent and consequential responses to participant behaviour, is crucial to the resolution of this important question. A future design might incorporate a multi-variant baseline of measures of both participant and significant others. In order to examine the differential effects of the direct and indirect routes of therapeutic effect, an experiment might be run in which one group involves the staff as 'individual helpers', and one group excludes the staff form involvement in the therapy, thereby maintaining their naivety of the strategies used in the intervention.

The direct route of therapeutic effect has been discussed in relation to the results. The explanations offered by Sensory Integration Theory were rejected for a number of reasons in favour of the role of sensory reinforcement. It was suggested that the **I.S.E.** intervention made the participants more amenable to environmental contingencies. However, the current assessment methodology did not examine this phenomenon specifically. Future research

might schedule assessments at: baseline (no intervention); during the intervention session; immediately after the session; and at later times in the natural environment. This would allow for the examination of the participant's responses to environmental contingencies under different conditions and to inspect the enduring effects of the intervention at various points after the intervention session. One might expect that participant engagements would become less frequent the further from the actual session they are, i.e. optimal responding should be achieved in the actual session.

6. Keyworker Evaluation:

The current study planned to use an 'Engagement Background Questionnaire' with the keyworkers. The purpose was to establish the opinions or perceptions of the significant other regarding the participant's range of interactive behaviours. It was expected that as participant purposeful behaviour was measured to increase, so it would be reflected in the perceptions of the significant other as calculated by the administration of a questionnaire. However, the questionnaire proved to be unreliable and provided insufficient, useful information. The results were not used in the final analysis. It was the opinion of the researcher that for the questionnaire to be more useful, more detailed information needed to be accessed. However, it was also acknowledged that this in itself might create difficulties in its consistent use by a staff team with varying experience and formal training. Future work might concentrate on the development of qualitative interviewing techniques to examine the attitudes of staff to clients, and the practical knowledge and skills acquired through their involvement in the delivery of intervention. This would provide relevant information for the evaluation of the indirect route of therapeutic effect.

Furthermore, a useful adjunct to such a measure might be to ask the significant others in their role as 'individual helpers' to rate the interest value of the activities used in both the interventions. The interest and motivation of the significant other has been observed to be potentially important to the participant's progress.

8.2.3 Intervention

1. Operational Definition of I.S.E.:

The running of the **I.S.E.** intervention was based on the outcomes of the Decision-Making Schedule carried out with each participant. The decisions taken have been acknowledged to be first level decisions. Second level decisions relating to: interaction response levels (i.e. level of input from therapist to participant - one to one, pair, small group); group dynamics (i.e. degree of social participation with peers and staff); presentation specifications of stimuli regarding choice, turn-taking and joint attention; and sensory contact details, were taken informally over the first two or three intervention sessions. However, the consistency of these decisions was dependent on the researcher's presence. Future work requires the standard documentation of these decisions such that replication across participants is possible.

The presence of the researcher in therapy sessions was not ideal as researcher expectations may have influenced the effects of the two interventions. To a certain extent this was necessary to the development of the **I.S.E.** intervention. It is recommended that future research initiatives employ others to run the therapy sessions. The interventions were administered at twice weekly intervals for one hour each. Future research may examine the frequency of sessions by contrasting an intensive approach, i.e. daily, with a less frequent one, i.e. once weekly.

2. The I.S.E. Construct:

Whilst it the current study has concluded that the intervention **I.S.E.** did indeed effect changes in the engagement levels of the sample population, it is not clear what part or parts of the developed construct **I.S.E.** were chiefly responsible for the changes. Consideration of the process of change raises a number of questions. Was it the content or feedback features of the sensory stimulation that was crucial to the therapy reactivity? Perhaps the reduced verbal code employed in the presentation of activities positively affected engagement levels, or was it the application of a hierarchy of support cues that variously facilitated the interactions of individuals? Further study of the constituent variables within the **'Individualised Sensory Environment'** is required to examine their differing influences

over the situation and to provide unequivocal support for the theoretical base thus far developed. Furthermore, the enskilling of staff by the indirect route of therapeutic effect needs to be explored. A future research design might involve significant others in the intervention with only half the sample, in order to compare the comparative results.

The consistency of the running of therapy sessions was largely dependent on the presence of the researcher. Future work recommends the development of minimum standards which might be subject to random audit to monitor the content of therapy. Such a device might include a checklist for recording the skills demonstrated to significant others or a frequency count of the number of presentations made to a client during any one session. This would contribute to the consistency of replication studies using **I.S.E.** intervention.

Although significant changes were recorded in the data derived from each experimental group at crucial stages within the project, inspection of participant assessment profiles revealed individual differences. Where a rejection of or withdrawal from a number of sensory items is observed within the 'Decision-Making Schedule', as was the case for one participant who emitted an aversive reaction to all items with the '+wet' feedback feature, the appropriateness of the programme contents must be called into question. This calls for a clearer definition of the candidacy profile for the **I.S.E.** intervention. In short, the results of the study, although they provide support for the **I.S.E.** construct, do not recommend its widespread use for **all** clients meeting the referral criteria. Further work needs to be done on a detailed candidacy profile for the use of potential, clinical practitioners.

8.3 Implications for Future Work

The concluding part of the thesis is about the implications of the current study for the future work of the Speech and Language Therapist in the context of services for adults with learning disabilities.

8.3.1 Service Philosophy and Practice

This first section is about the impact of the current study on the philosophy of 'Social Role Valorisation' (S.R.V.) and the '5' accomplishments from 'Normalisation' that guide the

design and delivery of services to adults with learning disabilities (Wolfensberger, 1972). The current study has been about the development of an intervention to meet the very 'special needs' of adults with severe learning disabilities, limited functional independence and restricted intentional communication. It has sought a solution to their needs by utilising a developmental frame of reference within a structured intervention where sensory stimulation was a key artefact. The nature of the intervention in the context of the service philosophy (S.R.V. and the '5' accomplishments) raises two main questions for address: (i) Does the nature of **I.S.E.** intervention present a conflict for services that are guided by the philosophy of S.R.V. and the '5' accomplishments, because of its apparent incompatibility with the adult lifestyle?; (ii) What is the justification for the use of a sensory-based programme of activities in preference over normal, every day activities that might provide the client with the same opportunities for responding? These questions will be dealt with in order.

(i) Does the nature of I.S.E. intervention present a conflict for services that are guided by the philosophy of S.R.V. and the '5' accomplishments, because of its incompatibility with the adult lifestyle?

The first point relates to the common misinterpretation of the philosophy (i.e. S.R.V.) as a technology for service provision. Technology here, is defined as the strategies that are invoked to deal with the **process** by which achievements are made. Adult learning disability services have tended to focus on five major principles termed accomplishments (O'Brien, 1981), i.e. community presence; developing relationships; enhancing respect and dignity; choice; developing competence. These originated from the 'Normalisation' philosophy and have continued to be used as a framework of reference by which to deliver and evaluate services for the learning disabled population. This has shaped the provision of community based services with the emphasis on the ordinary lifestyle. However, confusion between philosophy and technology frequently exists within many services. It has already been pointed out in the earlier literature review, that two of the defined 'accomplishments' (i.e. choice and developing competence) could be viewed as mechanisms of process rather than actual accomplishments. The other three 'accomplishments' (i.e. community presence, respect and dignity, and relationships) are in fact dependent on these process mechanisms. A

question that is related to the one above is: *'Who really benefits from the way the philosophy is interpreted?'*

Van der Gaag and Dormandy (1993) pointed out a number of common misconceptions regarding the philosophy, amongst which was *'...packaging' an individual's life.....providing ordinary housing, ordinary transport, ordinary leisure activities because these things will make him or her more 'acceptable to society.'* (p. 111). The problem would appear to lie in services which focus on image rather than process. The desire of support staff to achieve the lifestyle of the non-disabled adult for their learning disabled clients, in terms of value and adult images would seem to outweigh the meeting of the special needs of the individual. Hence, the client's involvement in domestic chores because it is a 'normal, adult activity', may not take into account the individual's functional skills. Similarly, a support worker may seek the views of the residents at a house meeting in the act of 'respect and dignity' but may fail to acknowledge the impaired communication skills of the individual. This can lead to denial of real need and even handicap the client further, i.e. the over estimation of a client's skills is equated with the effects of negative expectations.

The 'deviancy career' established by O'Brien (1981), illustrates the impact of negative attitudes. This is explained as: the learning disability of the client may effect negative attitudes and expectations in others (i.e. because they are learning disabled they will not achieve), which in turn limits the opportunities that are provided, thereby effecting the functional skills of the individual (i.e. a lack of opportunity deprives the client of essential learning experiences). A second example of the 'deviancy career' might be explained as: the misinterpretation of the philosophy of normalisation (i.e. as a technology rather than a philosophy that simply **guides** learning disability services), which may affect unrealistic attitudes to and expectations of, learning disabled adults (i.e. because the emphasis of the philosophy is on the ordinary life, it is important to expect the same achievements for learning disabled people as non-disabled others), which in turn will affect the appropriateness of the opportunities that are provided, thereby affecting the functional skills of the individual (i.e. the provision of opportunities where the response demands are in excess of the client's skills deprives the client of essential learning experiences).

Thus the conflict between the philosophy of services and the technology of service provision is highlighted. The **first** important point to make is that the **I.S.E.** intervention of the current study is not about philosophy, it is about technology. It is not so much focused on the actual images or accomplishments of the service (i.e. community presence, relationships, respect and dignity), as it is on the process by which they are achieved, i.e. developing competence and choice. The **second** issue is that the **I.S.E.** intervention has stressed the importance of building on observable, responding behaviour and as such deals with the present skills of the client. Therefore, it does not establish a 'deviancy career' that deprives the individual of using the skills they have.

The **third** point is that it is easier to achieve the 'normal' lifestyle of an adult, if the skills of the individual enable them to access and participate in the opportunities of the service. For example, adult educational classes and employment opportunities frequently demand a level of comprehension such that the client is able to carry out the teacher's or employer's instructions. Those people who are less able, lacking the skills to access the opportunity, are often not involved in such activities. They are frequently seen on the margins of activity because of this mismatch between how the philosophy influences services and the 'special' needs of individuals. The **I.S.E.** intervention seeks to bridge the gap between service opportunities and the skills of the individual, by the provision of social interaction opportunities that establish access for the person's interactions, i.e. by targeting present skills and providing motivating consequences for individual responding. Therefore, the **I.S.E.** intervention, by tackling the process by which the client achieves, facilitates the *learning disabled* person to access ordinary life events.

To summarise, it is acknowledged that the nature of **I.S.E.** intervention may present a conflict for services where the philosophy of normalisation has been misinterpreted as technology, and may even appear to be incompatible with the adult lifestyle because normal adults do not usually participate in it. This may present a dilemma for some services. However, **I.S.E.** is about the *process* of developing interactions. It is not about lifestyle image. It has been devised because some learning disabled people are recognised to have severely limited skill sets. An individual solution has been developed to meet their 'special'

needs. If their needs are met such that social opportunities are expanded and their isolation is reduced, the development of relationships, community presence and respect/dignity is enhanced. Furthermore, these people are vulnerable in a service that is overly concerned with public images and does not attend to the process of achievement, i.e. they are at risk of being marginalised.

In short, the **I.S.E.** intervention provides the technology for the realisation of the service philosophy. It is therefore, not incompatible with normalisation and the five accomplishments. However, where services and employees have misinterpreted the meaning of the philosophy, conflicts are likely to arise when attempting to introduce such an intervention as **I.S.E.** Potential practitioners need to be aware of this and to invoke strategies to deal with it, e.g. staff training on the risks to the client in the philosophy versus technology dilemma.

Finally, the current study has involved an evaluation of participant-preferred reinforcers within a clinical framework. Thus, in some small way, it has started to examine the ways in which choice-making amongst severely learning disabled adults who are not yet intentional communicators, might proceed. This would have a direct bearing on lifestyle and communication support for this population and prompts the need for further research into stimuli selection and its relevance to functional choice-making.

(ii) What is the justification for the use of a sensory-based programme of activities in preference over normal, every day activities that might provide the client with the same opportunities for responding?

Learning disability services have recommended activities that have *a positive/habitational emphasis'* (Guy's Health District, 1981; p. 82). It has also been stressed that when people are in danger of being excluded due to behavioural problems, some very individual solutions should be sought. The main justification for the use of **I.S.E.** intervention lies in the second statement, i.e. some learning disabled people are at risk of *being excluded due to behavioural problems.* This seems to acknowledge that there are indeed individuals who are not naturally able to access the 'ordinary' adult lifestyle without some special solution. The

solution offered by **I.S.E.** intervention is the provision of appropriate social interaction opportunities with reinforcing consequences based on the individual's sensory preferences. It starts off by proving that candidates for this intervention are typically engaged in high levels of non-purposeful activity characterised by neutral and stereotypic behaviours. In short, every day activities that are provided do not appear to be sufficient to attract the attention and responding behaviour of the client. Therefore, a solution is provided that aims to make environmental contingencies more available to the client. One that not only prepares the client to take advantage of environmental contingencies but that also coaches the significant others in appropriate ways to present opportunities to the client and to facilitate their responses.

The provision of sensory-based opportunities in the **I.S.E.** intervention is justified in that it represents one solution regarding the process of developing competencies. It should not be seen as a replacement of everyday activities but more as a means to an end. Obviously the major area of concern is generalisation of effect and this is one reason for focusing on activities which have an obviously, strong 'habitational emphasis'. However, the **I.S.E.** approach demonstrated the provision of social interaction opportunities that were meaningful to the individual, in order that staff (i.e. individual helpers), were able to use intervention strategies in the natural environment, i.e. outside the therapy environment, with their clients. In short, the real life events were suitably adapted to meet the client's needs.

What is the Relationship Between the Service Philosophy and I.S.E. Intervention?

The final question is a summary of the previous two questions. *Is there a risk, that **I.S.E.** intervention with its developmental frame of reference, minimal verbal communications and response-contingent procedure, will negatively affect the human value of participants in relation to the attitudes and behaviours of significant others?* If the **I.S.E.** intervention provides a process whereby individuals are provided with appropriate opportunities so that they can use the skills they have, it is teaching others to value what the person <u>is</u> able to do. A service which neglects the skill set of the individual in the pursuit of 'normalising' their image, is guilty of <u>**devaluing**</u> the skills of that person.

Finally, it is recognised that, although **I.S.E.** intervention may seriously challenge not only the ways current services are provided, but also the people who are employed to deliver services, any apparent conflict with the philosophy of 'social role valoristion' is borne out of a philosophy misconceived as a technology, rather than any real opposition to the ideology. The resolution of this particular dilemma should give rise to new approaches in working with those learning disabled adults who remain on the margins of major aspects of services.

8.3.2 Speech and Language Therapy Practice

The current study has focused on the development and evaluation of an intervention (**I.S.E.**) for use with learning disabled adults. There are two central questions to be asked: (i) What contributions has the current study made regarding the work of the Speech and Language Therapist in learning disability services?; (ii) What direction is given to potential practitioners of **I.S.E.** by the study's findings? These will be dealt with in turn.

(i) What contributions has the current study made regarding the work of the Speech and Language Therapist in learning disability services?

This thesis has highlighted two main areas for the attention of the Speech and Language Therapist. These are: assessment; and the process of intervention.

The current study separated out the two main functions of the assessment process: the first being to identify the baseline performance of an individual against which to measure outcomes of therapy; the second being to identify the direction in which therapy is planned. The first function of assessment (i.e. computation of changes from baseline), if intrinsically linked to the intervention planning process, may compromise its independent status for the measurement of outcomes. The systematic observation procedure used in the current study provides an essentially flexible, useful and objective method for assessing the skills of a diverse population. The focal areas of observation may change according to the nature of the presenting problems whilst the procedure remains the same. It provides the Speech and Language Therapist with a flexible approach to baseline assessment and measurement of outcomes which is independent of the therapy process. In short, it has overcome some of the problems in assessing this population with its range of learning disabilities, diversity of skill

sets, and variations in sensory and motor impairments, by demonstrating the use of a systematic method that can be adapted to the presenting features of the individual.

The second function of assessment is to identify the direction for planning therapy. This is where the knowledge domains and skill mix of the therapist is crucial in developing an intervention plan that will achieve positive outcomes for the individual. There is a high dependence on the *'polymath...*nature of the*...profession'* referred to by van der Gaag and Davies (1994). This means that consistency in approaches to the same presenting problems is likely to differ across individual therapists. This second function was fulfilled by the creation of a Decision-Making Schedule which provided a structure for the key decisions taken by the therapist. Although its decisions were limited to first level entry of participants to the intervention (second level decisions had to be made in the first few sessions of therapy), clarity and consistency across participants was achieved.

So, what contributions has the current study made regarding the work of the Speech and Language Therapist in learning disability services? ***Firstly***, it has demonstrated the use of an assessment method that maintains its independence from the chosen method of intervention. Furthermore, it focuses on outcomes in the natural environment thereby examining the important issue of generalised therapeutic effect. ***Secondly***, it has developed an intervention for use with learning disabled adults who appear to be non-communicating and who engage in non-purposeful behaviour. The intervention termed **I.S.E.** is based on a theoretical framework and has achieved a certain level of operational clarity. It utilises a Decision-Making Schedule to insure consistency and clarity of approach used by therapist across all clients fulfilling the candidacy criteria. In short, it provides what Gerard and Carson (1990) referred to as a *'...system of decisions.'* (p. 75) upon which to base therapy. Furthermore, its efficacy has been demonstrated with a small, sample population.

There is a ***third*** contribution that the current study makes to the work of the Speech and Language Therapist in learning disability services. This is with regard to the therapist's role as a trainer of others. Although the current study did not primarily focus on the indirect route of therapeutic effect by teaching staff appropriate strategies to use with their clients, it

seems likely that their involvement in the intervention as 'individual helpers' did in fact serve to enskill them. This means that the intervention did partly deal with *'the problem of transferring stimulus control of language from the therapy setting to the natural environment'* and furthermore, improved the *'Maintenance of newly trained skills.....by assuring functional consequences for communication'* as recommended by Calculator and Bedrosian (1988) (p. 157). However, future work has been recommended that provides baseline assessments of not only the learning disabled client, but also of their main communication partners.

The implication of the current study is that indirect practice (i.e. training of others) and direct practice (i.e. intervention with clients) should be brought much closer together. McLeod et al (1995) highlighted the need for an approach that bridges the gap between the classroom and the natural environment, such that staff learning is closely facilitated in partnership with client's learning. The intervention in the current study is viewed as an approach that encompassed both the direct and indirect routes of therapeutic effect. Sessions resembled interactive workshops between staff and clients, rather than therapy sessions for clients. The staff were instrumental in taking responsibility for the client's learning by the modification of their own skills. It would be valuable to compare the outcomes on the staff-client communication partnership by delivering intervention under three separate conditions: (a) direct intervention with client (no staff involved); (b) indirect intervention (formal training of staff on key strategies); (c) a combined approach as represented by the current study. Given the outcomes of the current study which has used a combined approach (c), and the question that it raises, clinicians would be well advised **not** to discard the direct approach in favour of a training approach. Further work on the evaluation of their separate outcomes needs to be carried out before any conclusions may be drawn regarding efficacy.

(ii) What direction is given to potential practitioners of I.S.E. by the study's findings?
Although the introduction of the 'Individualised Sensory Environment' appears to have effected changes in participant engagement levels, these results should be viewed as preliminary findings. The therapy construct has been applied to a relatively small sample and follow up data has revealed poor maintenance of therapeutic gains. It therefore would seem

wise to replicate the conditions with a larger sample and to examine each of the potential factors of influence on performance gains. Once identified, it would seem prudent to devise suitable strategies to maintain participant behaviour after the withdrawal of therapist time and to evaluate their separate effects on the situation.

A number of questions in relation to **I.S.E.** remain. **Firstly**, will this method of intervention be useful with all clients who fulfil the original referral criteria? The limitations of the referral criteria have been highlighted earlier. Whilst the Referral Form is capable of identifying likely candidates for **I.S.E.** intervention based on their restricted communication skills and high levels of non-purposeful behaviour, it does not assure their amenability to the programme. The examination of outcomes to single cases within a broader sample is required for more conclusive evidence regarding candidacy criteria.

Secondly, how far has the efficacy of the **I.S.E.** intervention been proved? The validity of the intervention has been proved with a small sample population of sixteen participants. It is important that replication studies are set up that seek to evaluate the effects of the **I.S.E.** intervention with other sample populations in different settings. This is so that the validity of the **I.S.E.** intervention may be extended thereby strengthening its efficacy as a therapy technique. Furthermore, this will provide additional support for the theoretical framework of the 'Individualised Sensory Environment' such that it may be applicable to more adults with learning disabilities.

Thirdly, how easy is it to replicate the intervention procedure? The practical outcomes of the current study consist of: (i) a theoretical framework upon which the clinical rationale of **I.S.E.** intervention is based; (ii) an assessment method that employs systematic observation procedures for the independent measure of baseline performance and therapy outcomes; (iii) an operationally defined intervention that identifies first level decisions for participant's entry to the therapy setting. Secondary decisions regarding group dynamics and social participation levels have not been systematised in the context of the current study. Further work is required on the level of specification of second level decisions. Due to the complex

nature of the instrumentation, a period of training is recommended for any potential practitioners to insure consistency of practice.

For the specific guidance of other therapists or potential users of the therapeutic model, further investigation into the construct **I.S.E.** is recommended, together with a clear definition of the relationship between the independent and the dependent variables in the context of the social environment.

8.4 Conclusion of Thesis

The current study has focused on the development an intervention termed an 'Individualised Sensory Environment' for adults with learning disabilities and an evaluation of its effects on their interactive behaviours. Various amounts of attention have been paid to four main areas: **(i) the theoretical phase** which has focused on the development of a theoretical framework and supporting clinical rationale. This has been based on a synthesis of the reviewed literature on the role of reinforcement and sensory reactivity; Sensory Integration Theory and Therapy; and current intervention practice with learning disabled adults; **(ii) the definition phase** which has involved the profiling of appropriate candidates for the intervention by the use of a Referral Form. A richer description of the sample population was completed by the use of a multi-axial Case History form, such that multiple comparisons could be drawn between the sample population and the remainder who were characterised by their intentional communication and purposeful behaviour; **(iii) the construction phase** which has focused on the development of suitable instrumentation for the baseline assessment in the form of a systematic observational procedure, and a Decision-Making Schedule upon which to base first level clinical decisions required for devising individual programmes of intervention. A paucity of suitably published and available materials has necessitated a strong development component in the current project. Some pilot studies were also carried out as part of the construction phase; **(iv) the experimental phase** which has applied the resulting clinical intervention to a relatively small sample divided into two groups of reversed, alternating treatment orders. The effects of which have been evaluated.

The results have been discussed in relation to the key areas of the literature review. Sensory Integration Theory (Ayres, 1972, 1979; Fisher et al, 1991) has been rejected as a possible explanation for change. The role of sensory reinforcement and sensory reactivity has been emphasised, together with the changing attitudes and interactive behaviours of significant others as potential agents of change. These preliminary findings suggest that further work needs to be done regarding the evaluation of the **I.S.E.** intervention and the strategies for its implementation.

This thesis has recounted the development and evaluation of an intervention incorporating structured sensory stimulation within a response-contingency procedure. As such, much of the discussion has focused on the characteristics of the resulting intervention and its relationship to the changing engagement levels of the participants. However, the importance of present social and environmental factors cannot be ignored. These are relevant to our understanding of assessment data, both before and after the delivery of intervention. The important, although unmeasured, therapeutic effect of the indirect route in terms of the role of the significant other, has been discussed in the previous chapter. Available social interaction opportunities and environmental contingencies will necessarily influence the current level of functioning of individuals. Furthermore, the support and maintenance of the individuals' behavioural repertoires are very likely dependent on the provision of appropriate opportunities. This is crucial to the generalised use of newly acquired responses from the therapeutic setting to the natural environment. The externalisation of therapy decisions in relation to the **I.S.E.** intervention is clear. The priority for future investigation is the examination of the relationship amongst the intervention, the engagement levels of the individual, and social/ environmental attributes.

Finally, there exists a broader need to clarify the philosophy of 'social role valorisation' if the very special needs of adults with learning disabilities are to be met. Consideration needs to be given to the precise development of interventions for use with learning disabled adults that involve significant others within the process of change and take into account the issues of social and environmental attribution. When people are in danger of being excluded due to

behavioural problems or by their own social isolation, some very individual solutions should be sought as demonstrated by the current study.

I.S.E INTERVENTION: OPERATIONAL DOCUMENT (1)

I.S.E. Programme Planning: Strategic Areas for Consideration

A number of areas have been identified as important for the making of decisions regarding the planning of an individual's intervention schedule and for making strategic adjustments during the course of therapy to reflect changing needs. These are: **1.** the response repertoire of the participant; **2.** definition of therapist' role; **3.** the participant's needs in relation to the therapy group's dynamics; **4.** specification of space and furnishings in environment; and **5.** the details regarding activity selection.

1. Response Repertoire

A profile of the individual's strengths in respect of the constituent elements of the interaction:

- person
- object
- event (person-object).

Further information is required regarding the type of response in the participant's repertoire in relation to the already mentioned interactional constituents:

- response (overt motor response)
- expression (form of self-expression, e.g. vocalisation)
- orientation (direction of response, e.g. to self or other person)
- denial (form of stimulus denial or rejection, e.g. self withdrawal)

RESPONSE	overt response to person or object, e.g. reaching; pointing; appropriate sign; picking up etc.
EXPRESSION	expression of self on presentation of contact, e.g. vocalising; clapping hands etc.
ORIENTATION	direction of the engagement, e.g. relating to self; relating to other person, includes eye contact.

Table A1.1: Definition of Response Repertoire

2. Definition of Therapist's Role

The help a person needs to facilitate a target response is formalised in a series of support cues, arranged in a hierarchy of complexity. The most frequently responded to cue is selected from the assessment trial. The support cues define the facilitating role of the therapist, and by their standard nature effect the minimal coding of verbal output by the therapist. A participant response to a less complex cue is said to be representative of a more complex response, and when a person is observed to respond to a less complex cue s/he is said to have made progress to be less dependent on the support of others regarding interactions with the environment.

PRESENTATION	RECURRENCE
1. Show/present item for contact	Say 'more' in relation to contact
2. Demonstrate item for contact	Say 'more' & sign in relation to contact
3. Offer item for contact	Say 'more' & offer in relation to contact
4. Give physical prompt for contact	Say 'more' & physical prompt in relation to contact

Table A1.2: Hierarchy of Support Cues for Person Engagement

PRESENTATION CUES
1. Present item and say 'look'
2. Demonstrate item and say 'look'
3. Physical prompt in relation to contact and say 'look'

Table A1.3: Hierarchy of Support Cues for Object Engagement

Two other parameters need to be considered when examining the changing role of the therapist in relation to the client's responses to the structured sensory input. These are areas which are difficult to quantify specifically but due to the nature of the direct intervention cannot be ignored. They are parameters which are observed by the therapist in the behaviour of the client.

(i) Rate of Interaction:

This is recommended for the individual according to the following:

- current mood of the client;
- experience of working with the client;
- client's responses to offered contact;
- attention level of the client;
- staff resources available.

(ii) Interaction Response Level:

This describes the level of input as supplied by the therapist and defines how contact is made with clients in terms of the division of their attentions between the client and their peers. In selecting the interaction response level for the individual the therapist needs to consider the orientation of the client to staff and peers (i.e. group dynamics).

ONE TO ONE	PAIR	SMALL GROUP	LARGE GROUP
Therapist works for a period of time with an individual. Attention in engagement activities is given singularly to the client.	Therapist works for a period of time with two individuals dividing the time as equally as possible between them. There is evidence of some shared attention and turn taking.	Therapist works with a small group of about 3 or 4 people, moving between the members in as equitable a way as possible. There is evidence of shared attention, turn taking and an awareness of the engagements of others.	Therapist works with a large group of about 5 or 6 people, facilitating engagements and activity. There is evidence of shared attention, turn taking and an ability to participate in shared activity with the other members.

Table A1.4: Definition of Interaction Response Levels

3. Group Dynamics

This parameter defines the relationship of the individual to other clients and to the therapist in engagement or activity. The level of the orientation will necessarily influence the role the therapist assumes in relation to the client. Group dynamics encompasses:

- Peer orientation;
- Staff orientation.

These define the relationship of the individual to other clients and to the therapist in engagement or activity. The level of the orientation will necessarily influence the role the therapist assumes in relation to the client. The category definitions first proposed by Parten (1932) in a study of children's play and later used by others to look at the development of attention levels and learning through play, are used as a reference here. The use of such an old reference is justified by the accessibility of its categorical descriptions and its amenability to being applied to the context of severely learning disabled adults within a social interaction framework.

PARTICIPATION LEVEL	DEFINITION
UNOCCUPIED	The client is not engaged, but occupies self with anything that happens to be of momentary interest. S/he engages in 'body-self' activity; gets on and off chairs; just stands around; gazes ahead etc.
ONLOOKER	The client spends time watching the actions of others and does not overtly enter into the activity. The onlooker is observing a particular person(s) and sits within speaking distance in order to hear/see everything that takes place.
SOLITARY/ INDEPENDENT	The client engages in activity independently making no effort to get close to other people. Solitary activity is pursued without reference to what others are doing.

PARALLEL	The client is independently engaged, but the choice of activity naturally relates to what others are doing. Items for activity are similar to those used by other(s) in parallel, but actions are performed as the person sees fit, and there is no attempt to influence or modify the activity of others. There is no attempt to control the coming or going of another group member.
ASSOCIATIVE	The client engages in activity(s) with others. Communications concern the ongoing activity; there is borrowing and loaning of equipment; mild attempts to control which others may or may not engage in the group activity. All the group members engage in similar if not identical activity; there is no division of labour; and no organisation of the activity of several individuals around any material goal or product.
CO-OPERATIVE	The client engages in a group that is organised for the purpose of making some material product; of striving to attain some competitive goal; of dramatising situations of group life; of engaging in formal games. There is a marked sense of belonging or of not belonging to the group. The control of the group situation is usually in the hands of one or two group members who direct the activities of the others. the goal as well as the method of attaining it necessitates a division of labour; taking of different roles by the group members; and the organisation of activity so that the efforts of one are supplemented by those of another.

Table A1.5: Categorical Definitions of Social Participation Levels

(i) Duration of Orientation:

Similar to *'rate of interaction'*, although difficult to predict how long an individual will engage in an activity at any one time, the therapist must recognise that there are a number of influential factors to consider:

- current mood of the client;
- experience of working with the client;
- client's responses to offered contact;
- attention level of the client;
- staff resources available.

4. The Environment

The way in which the environment/space is managed will be influenced by the following:

- interaction response levels;
- response repertoire - constituent elements of the interaction;
- peer/staff orientation;
- dimensions of activity(s).

(i) Space Requirements:

Refers to the use of space required by an individual and for an activity. Also to the support required to move around the environment.

(ii) Furnishings:

Refers particularly to the physical needs of an individual in terms of the following:

- posture/position/control, i.e. any special arrangements or physical support that are required for the individuals seating, position and movement in the therapy space;
- seating;
- access to activity/engagement opportunities in relation to the specific mobility needs of the individual.

5. Form of Sensory Stimulation or Specification of Activities

Items for inclusion in the ***'Individualised Sensory Environment'*** are chosen for the participant's purposeful and positive responses to them. Where the participant's response is one of denial, denoting a rejection/refusal, the item is not included in the intervention programme. Participant preference is of paramount importance to the whole process. The decisions regarding the forms of stimulation are based on a dimensional analysis of the feedback features (sensations) produced by the sensory equipment/activities, **(Appendix C2)**, summarised in the *'I.S.E. Programme Plan'* **(Appendix C4)**, with client progress recorded in the *'I.S.E. Therapy Log Sheet'* **(Appendix C5)**.

There are five main areas for consideration in the planning and later adjustment of the therapeutic programme. These are:

- ***Choice*** which refers to the method of activity presentation and to the degree of control of stimulus selection as assigned between therapist and client;
- ***Turntaking*** which refers to the ability of the client to work in a dyad with another person and will directly influence the interaction response level;
- ***Joint attention*** which refers to the ability of the client to attend to the same item as one other, i.e. staff or client;
- ***Contact*** which refers to any specific preferences in terms of tactile contact as defined by the client's responses to it and includes identification of sensory defensiveness and strategies for dealing with it;
- ***Denial*** which refers to the response used by the client denoting a rejection/refusal or a response to an item causing the client to be at risk by its use. Item is either excluded from use in the programme or else a strategy for dealing with the risk is recommended.

Summary of Therapeutic Aims

The ***'Individualised Sensory Environment'*** seeks to provide the participant with the opportunities for overt adaptive responding (i.e. use of individual response repertoire); by the provision of structured sensory stimulation based on shown preferences; and supported by the appropriate cues for the facilitation of target responses, which also define the role of the Therapist.

The intervention programme incorporates all these principles and is responsive to the individual's needs, whether in a group context or in a one to one situation. Each element of the programme is based on an assessment/decision making schedule completed by the therapist on the participant and reflects the clinical rationale defined here.

I.S.E INTERVENTION: OPERATIONAL DOCUMENT (2)

Group Management Strategy

For the appropriate definition of the roles of the Speech and Language Therapist and Assistant Therapist, it was decided to use the principles of *'room management'* as developed by Porterfield et al (1980). Their primary aim was to provide individual attention whilst maintaining high levels of group engagement. The emphasis of room management techniques is placed on benefits or positive outcomes to the individual. It is designed to reflect the various needs of individual clients, their unique therapy goals, and to cope with differences in resources available (Sturmey and Crisp, 1989).

1. General Principles

The general principle of role prescription has been used in special needs classroom management (Pope, 1988), residential provision for severely and profoundly learning disabled adults (Mansell et al, 1982), mainstream primary schools (Thomas, 1985), and management of general staff behaviour (Whitman, Scibak and Reid, 1983). Evaluation of effects has focused on group engagement and related outcomes, although operational definitions have tended to vary across studies (Sturmey and Crisp, 1989).

2. Definition of Roles

Two distinct roles are primarily recommended within room management:

- the room manager;
- the individual helper;

although a third role is frequently mentioned, that of the equipment mover.

The Room Manager: is responsible for all clients not currently receiving individual attention, and circulates the room making relatively brief but frequent contacts with them. *Holding activities* distributed are relevant to each client's skill set and are monitored and supported by the room manager.

The Individual Helper: carries out therapy activities on a one to one basis as appropriate, without interruptions.

The Equipment Mover: is responsible for setting out, removing and changing over the equipment according to the group's structure.

3. Objectives of Group Management

High levels of group engagement as one outcome measure have been reported by Porterfield et al (1980). This has been born out by the findings of Mansell et al (1982).

However, the low level of purposeful activity amongst learning disabled people in group settings is reported frequently in the literature, and in particular amongst those whose degree of disability negatively influences activity initiation (Pope, 1988). The collective principles of room management were considered a usefully applicable strategy for: (i) group organisation incorporating roles prescription for *'therapists'*; (ii) individual programmes within a group setting; (iii) maintenance of engagement levels amongst participants outside of individual attention; (iv) management of problem behaviours, e.g. curbing participant wandering behaviour; (v) the development of clear *'therapist'* roles for unqualified staff with activity demonstration and modelled communications. For the purposes of the management of the therapy groups, the role of *'equipment mover'* is merged here with that of the *'Group (room) Manager'*.

The group manager role was taken by the researcher to avoid the pitfalls experienced in **Pilot Study 2** where the application of therapeutic principles became variously inconsistent due to a lack of immediate role modelling, with demonstration, procedural maintenance, and activity monitoring. The researcher as the one qualified Speech and Language Therapist available to the running of each therapy group, and responsible for the construction of the intervention, was deemed the most appropriately placed person to assume this role.

The roles of individual helpers were variously taken by a nominated member of the relevant staff team and a Speech and Language Therapy assistant subject to their availability. The

assistant was used for sessions where the staff member was unavailable to participate in the session.

4. Prescription of Therapist's Roles

The specific duties assigned to the therapist's roles are defined here.

(I) Group *(room)* Manager:

- instructs setting out of activities and organisation of space;
- demonstrates presentation of activity and models communications;
- monitors timing process in group structure;
- instructs change over of equipment and activities;
- alerts individual helper to change over of participant/activity;
- circulates amongst group members and maintains brief but frequent contacts with those not with the individual helper;
- monitors problem behaviours and curbs wandering;
- makes strategic adjustments to individual's therapy programmes in consultation with the individual helper at the end of the session.

(ii) Individual Helper:

- provides time and support for individual goal achievement as appropriate;
- rotates around individuals in the group under the instruction of the group manager;
- incorporates peer orientation and adjusts staff role according to specified group dynamics in subject's programme plan;
- gives feedback on individual's achievements for programme adjustment to be applied to the next session;
- provides help in the setting up of activities and organisation of space.

I.S.E INTERVENTION: OPERATIONAL DOCUMENT (3)

I.S.E. Group Structure

In order to maintain a standard approach and for ease of administration to all participant groups, a group structure for the **I.S.E.** intervention was developed. This incorporated guidelines regarding timing of activities and a recommended order for their presentation.

TIMING	SPECIFICATION OF ACTIVITY
1. Person Engagement Activities *(15 minutes approximately)*	• indirect non touch • indirect touch • direct touch • direct vibro-touch
2. Simple Object Activity *(15 minutes approximately)*	• wet touch • dry touch • vibro-touch
3. Complex Object Activity *(15 minutes approximately)*	• dry sensory tray • wet sensory tray
4. Vestibular Stimulation **(1:1 accessed from activity 3.)**	• linear • angular
5. Person Engagement Activities *(15 minutes approximately)*	• indirect non touch • indirect touch • direct touch • direct vibro-touch

Timings specified here does not include setting up time at the start of or clearing away time at the end of a group. A certain amount of flexibility was necessarily built into the structure as it was felt important that developing participant autonomy should not be suppressed by a structure that was too rigid. In order to cater for individual participant preferences in the group setting, variations in mood and attention levels, the therapist exercised sensitivity to expressed or observed need, e.g. a participant wishing to move from person to object activity was not inhibited.

REFERRAL FORM (Survey 1)

INSTRUCTIONS: Please complete this form on your client. Consider each statement in turn. Tick the appropriate box if you consider the statement to be usual and characteristic of your client for most of the time. Ignore those statements which you consider to be uncharacteristic. Please use the comments column if you wish to add to the information indicated in the statements. All completed and returned forms will be dealt with confidentially.

CLIENT'S NAME:	**D.O.B:**

STATEMENTS	*TICK	COMMENTS
1. The client usually uses spoken words, signs or symbols to communicate with others.		
2. The client usually engages in purposeful activity of own accord, which is either goal or person oriented.		
3. The client's personal needs are usually supplied and anticipated by others.		
4. The client usually engages in non-purposeful activity which is not goal or person oriented and may be repetitive or stereotypic in nature.		

REFERRAL AGENT: **RELATION TO CLIENT:**	**REFERRAL DATE:**

Please return completed referral form to:

Speech and Language Therapy Service

REFERRAL FORM (Survey 2)

INSTRUCTIONS: Please complete this form on your client. Consider each statement in turn. Tick the appropriate box if you consider the statement to be usual and characteristic of your client for most of the time. Ignore those statements which you consider to be uncharacteristic. Please use the comments column if you wish to add to the information indicated in the statements. All completed and returned forms will be dealt with confidentially.

CLIENT'S NAME: **********	**D.O.B:**

STATEMENTS	*TICK	COMMENTS
1. The client usually uses spoken words, signs or symbols to communicate with others.		
2. The client usually engages in purposeful activity of own accord, which is either goal or person oriented.		
3. The client's personal needs are usually supplied and anticipated by others.		
4. The client usually engages in non-purposeful activity which is not goal or person oriented and may be repetitive or stereotypic in nature.		

OFFICE USE ONLY: Please circle appropriate answer.			
1. Is the client receiving Speech Therapy?	YES	NO	
2. If YES, what kind of therapy?			
3. Do you expect significant change?	YES	NO	UNSURE

Please return completed referral form to:

Speech and Language Therapy Service

APPENDIX B3

1. Summary of Referral Information for the Identification of the Sample and Remainder of the Population: Tables and Figures

Sample	%	Remainder	%	Excluded	%
21	15	112	83	3	2

Table B3.1: Distribution of Sample and Remainder of Population in Survey 1

Group A	%	Group B	%	Group C	%	Group D	%
14	57	4	17	3	13	3	13

Table B3.2: Distribution of Responses to Referral Form for Sample in Survey 1

Group E	%	Group F	%	Group G	%	Group H	%
99	88	6	5	4	4	3	3

Table B3.3: Distribution of Responses to Referral Form for Remainder in Survey 1

Sample	%	Remainder	%
19	10	175	90

Table B3.4: Distribution of Sample and Remainder of Population in Survey 2

Group A	%	Group B	%	Group C	%	Group D	%
5	10	0	0	14	2	0	0

Table B3.5: Distribution of Responses to Referral Forms for Sample in Survey 2

Group E	%	Group F	%	Group G	%	Group H	%
154	79	15	4	0	0	0	0

Table B3.6: Distribution of Responses to Referral Forms for Remainder in Survey 2

KEY for SURVEY 1: Total Population (n) = 136; KEY for SURVEY 2: Total Population (n) = 194.

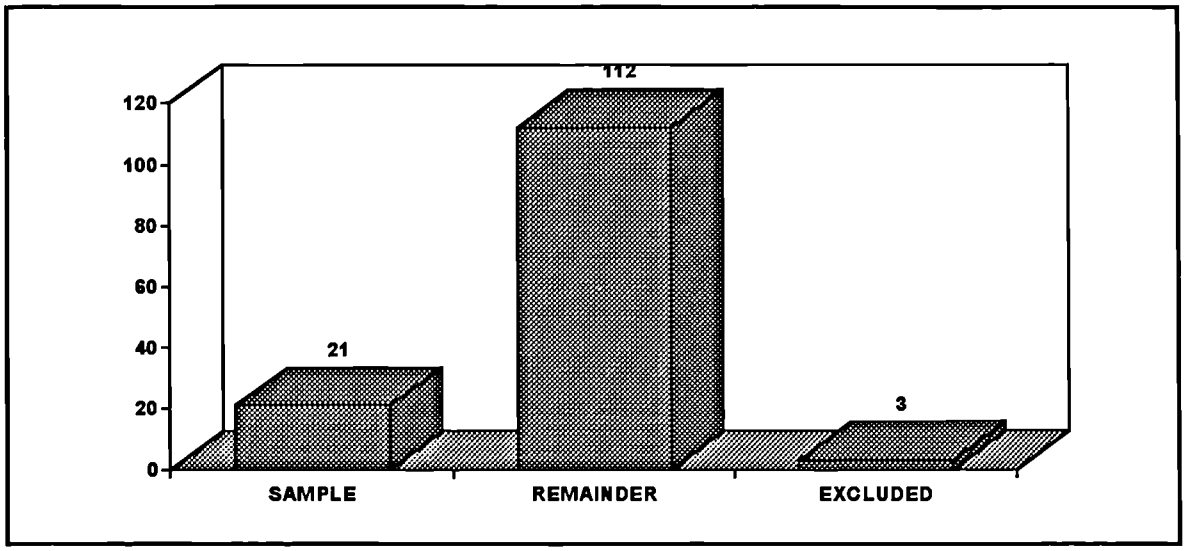

Figure B3.1 Survey 1: Distribution of Sample and Remainder of the Population

The true sample population represented 15% of the total population after the exclusion of three participants.

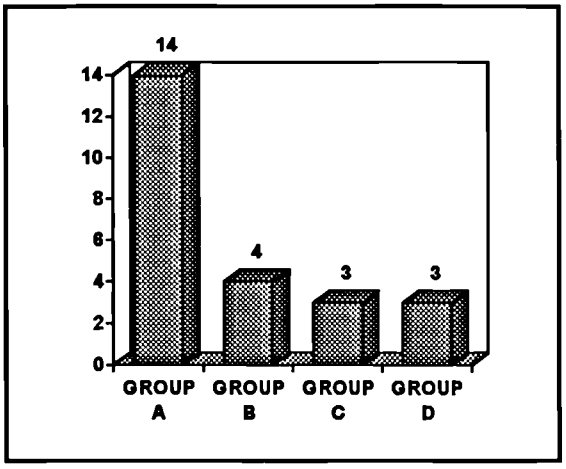

Figure B3.2 Survey 1: Distribution of Sample Population

Group A: statements 3 and 4 identified; Group B: only statement 4 identified; Group C: as well as statements 3 and 4, statement 1 was also identified, i.e. communication using sign , words or symbols. Consultation with keyworker(s) resulted in their inclusion.

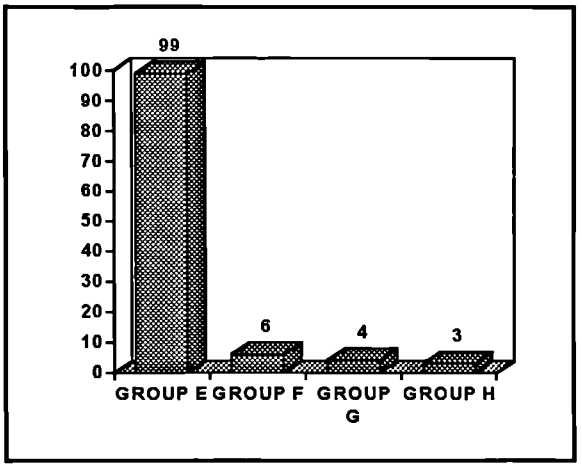

Figure B3.3 Survey 1: Distribution of Remainder of Population

The majority (88%) were considered to be intentional communicators who engaged in purposeful activity.

KEY for SURVEY 1: Total Population (n) = 136; KEY for SURVEY 2: Total Population (n) = 194.

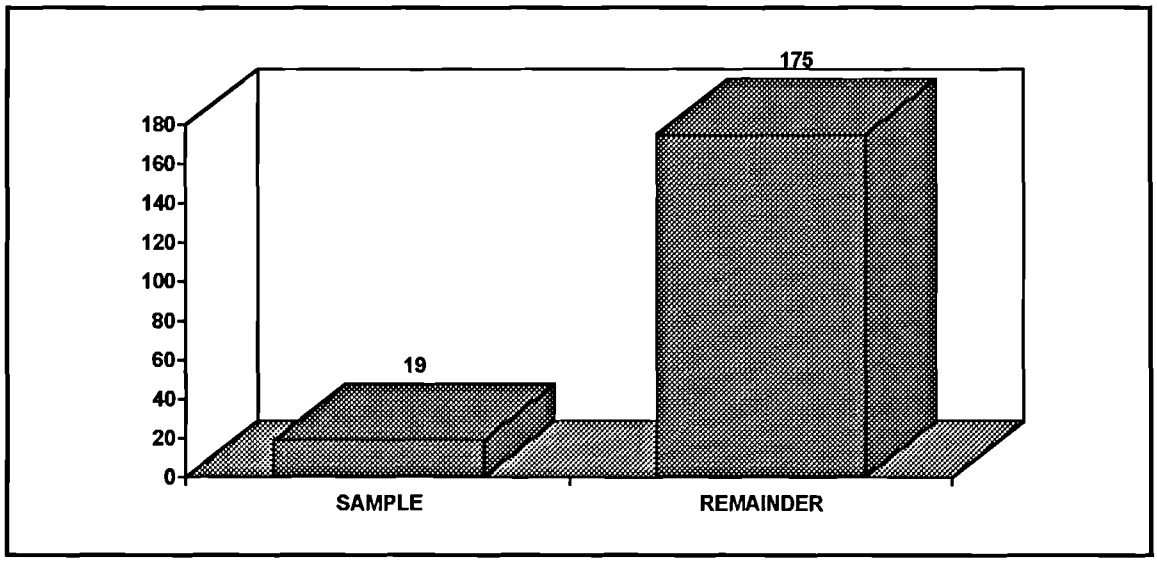

Figure B3.4 Survey 2: Distribution of Sample and Remainder of Population

The part of the population that met the sample's criteria was lower in this survey, representing only 10% of the total population.

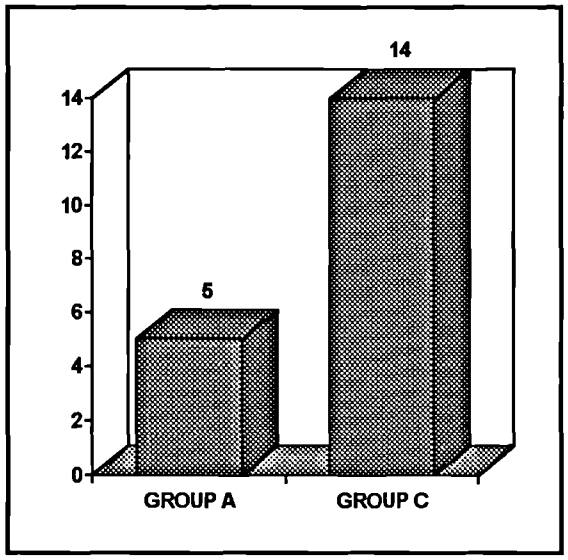

Figure B3.5 Survey 2: Distribution of Sample Population

The majority fell within Group C where referential communication had also been identified.

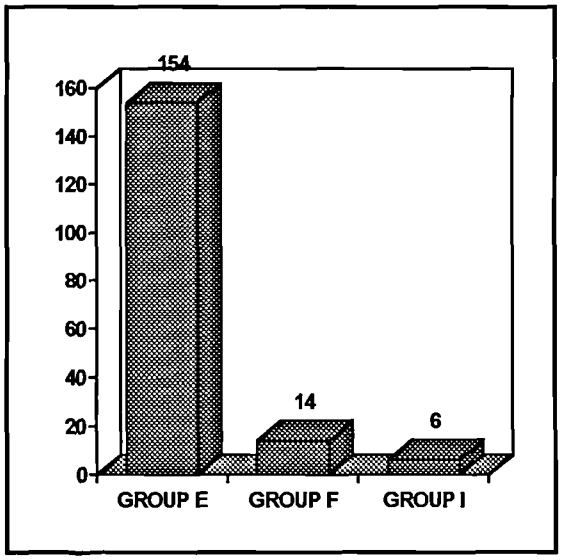

Figure B3.6 Survey 2: Distribution of Remainder of Population

Similar to Survey 1, Group E was the largest (79%). Group I represented those referral forms that were either returned incomplete or else spoiled.

KEY for SURVEY 1: Total Population (n) = 136; KEY for SURVEY 2: Total Population (n) = 194.

2. Summary of Referral Information on Age Distribution of Populations in Survey 1 and Survey 2: Tables and Figures

Up to 20	%	21-30 yrs	%	31-40 yrs	%
11	8	124	91	2	1

Table B3.7: Age Distribution of Total Population in Survey 1

Up to 20 yrs	%	21-30 yrs	%	31-40 yrs	%	41-50 yrs	%	51-60 yrs	%	61+ yrs	%
9	5	79	41	52	27	31	16	15	7	7	4

Table B3.8: Age Distribution of Total Population in Survey 2

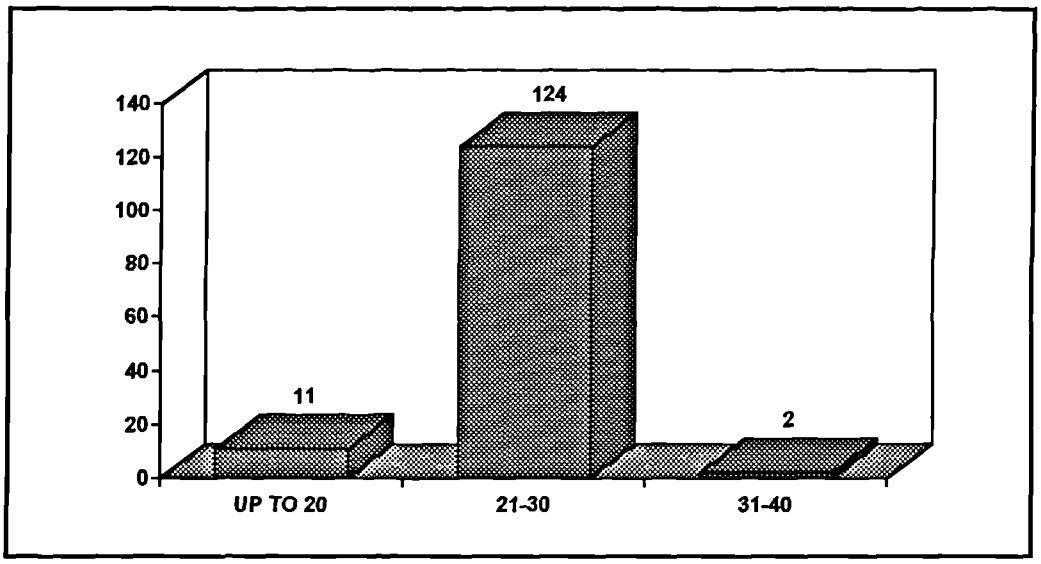

Figure B3.7 Survey 1: Age Distribution of Total Population

The majority fell within the age range 21-40 years (91%) with 8% under the age of 20 years and only 1% at 31 years and above. People above this age attended an alternative Day Centre in the borough.

KEY for SURVEY 1: Total Population (n) = 136; KEY for SURVEY 2: Total Population (n) = 194.

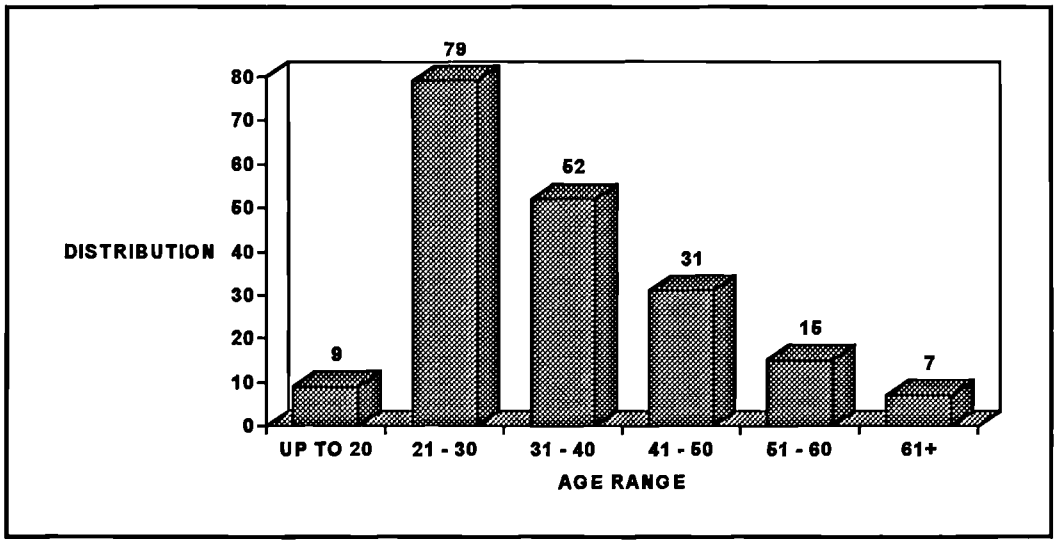

Figure B3.8 Survey 2: Age Distribution of Total Population

Similarly, the majority fell within the age range 21-40 years (79%). However, this survey covered a broader age range, with 27% falling in the 31-40 years range and 16% in the 41-50 years range.

3. Summary of Quality of Referral Forms Completions in Survey 1 and Survey 2: Tables and Figures

Valid	%	Contradictions	%
124	91	12	9

Table B3.9: Quality of Referral Form Completions in Survey 1

Valid	%	Contradictions	%
188	97	6	3

Table B3.10: Quality of Referral Form Completions in Survey 2

KEY for SURVEY 1: Total Population (n) = 136; KEY for SURVEY 2: Total Population (n) = 194.

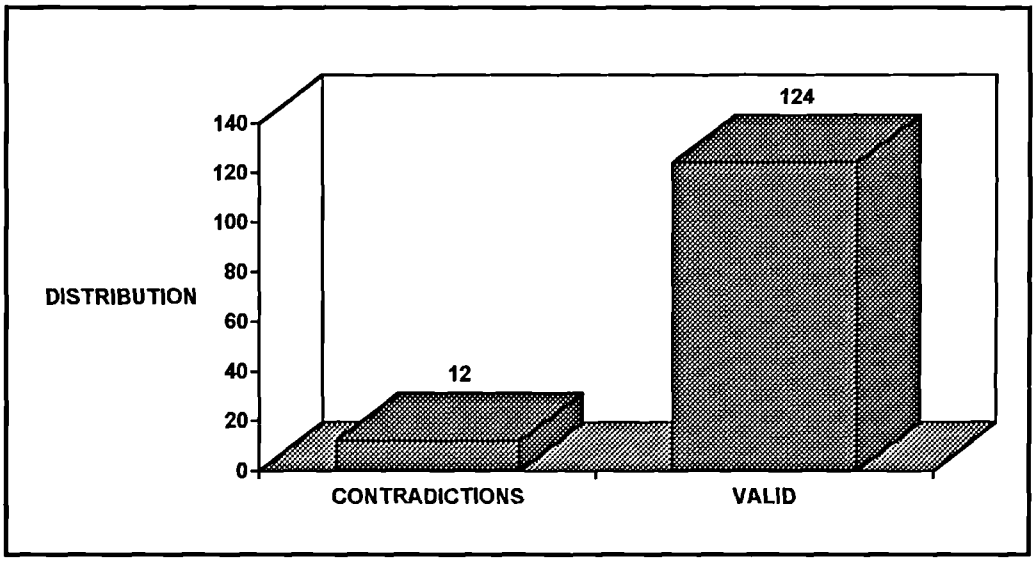

Figure B3.9 Quality of Referral Forms Completions for Survey 1

Contradictions in this survey represented 95% of all referral form completions.

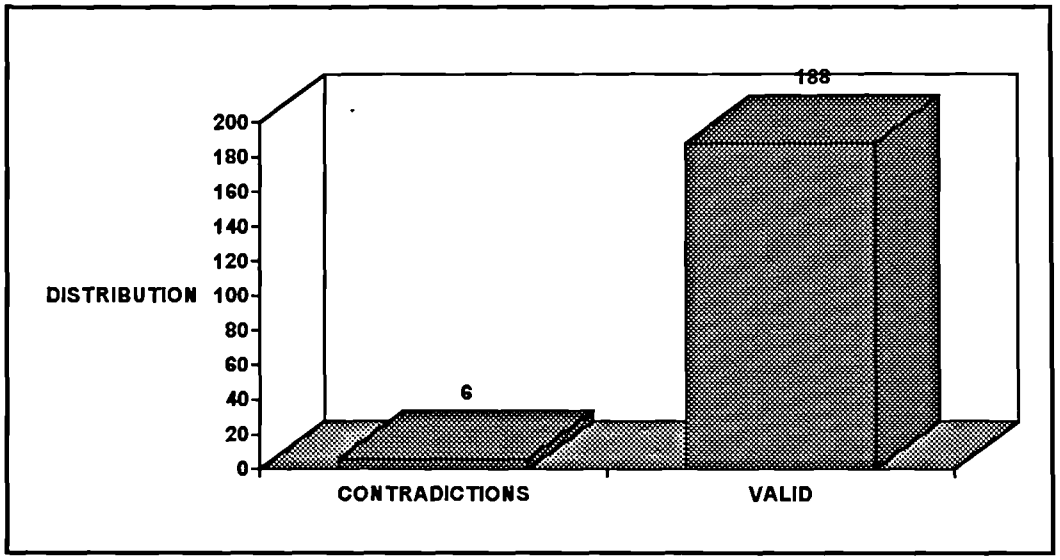

Figure B3.10 Quality of Referral Forms Completions for Survey 2

The number of invalid or contradictory forms was lower in Survey 2. This is probably due to the fact that the Speech and Language Therapist in Survey 2 was responsible for a proportion of the form completing, whereas Survey 1, only used Day Centre staff (Keyworkers) who were unskilled in this type of screening exercise.

KEY for SURVEY 1: Total Population (n) = 136; KEY for SURVEY 2: Total Population (n) = 194.

4. Summary of Referral Form Information Regarding Speech and Language Therapy Input Survey 2: Tables and Figures

YES (R)	%	NO (R)	%	YES (S)	%	NO (S)	%
59	34	116	66	12	63	7	37

Table B3.11: Speech and Language Therapy Input for Remainder and Sample in Survey 2

Sensory Activities	%	Basic Function	%	Assess	%
5	42	6	50	1	8

Table B3.12 Type of Speech and Language Therapy Input to 'Sample' Population in Survey 2

Role Play	%	Basic Function	%	Advice	%	Assess	%	Speech	%	Other	%
41	70	12	20	2	3	2	3	1	2	1	2

Table B3.13: Type of Speech and Language Therapy Input to 'Remainder' of Population in Survey 2

Therapist Judgement	Basic Functional Communication	Assessment	Sensory Activities
YES	4	0	3
UNSURE	2	1	2

Table B3.14 Expected Outcomes of Speech and Language Therapy Input to 'Sample' Population in Survey 2

Therapist Judgement	Role Play	Basic Functional Communication	Advice	Assessment	Speech Work	Other
YES	28	5	1	0	1	1
UNSURE	13	7	1	2	0	0

Table B3.15 Expected Outcomes of Speech and Language Therapy Input to 'Remainder' of the Population in Survey 2

KEY for SURVEY 1: Total Population (n) = 136; KEY for SURVEY 2: Total Population (n) = 194.

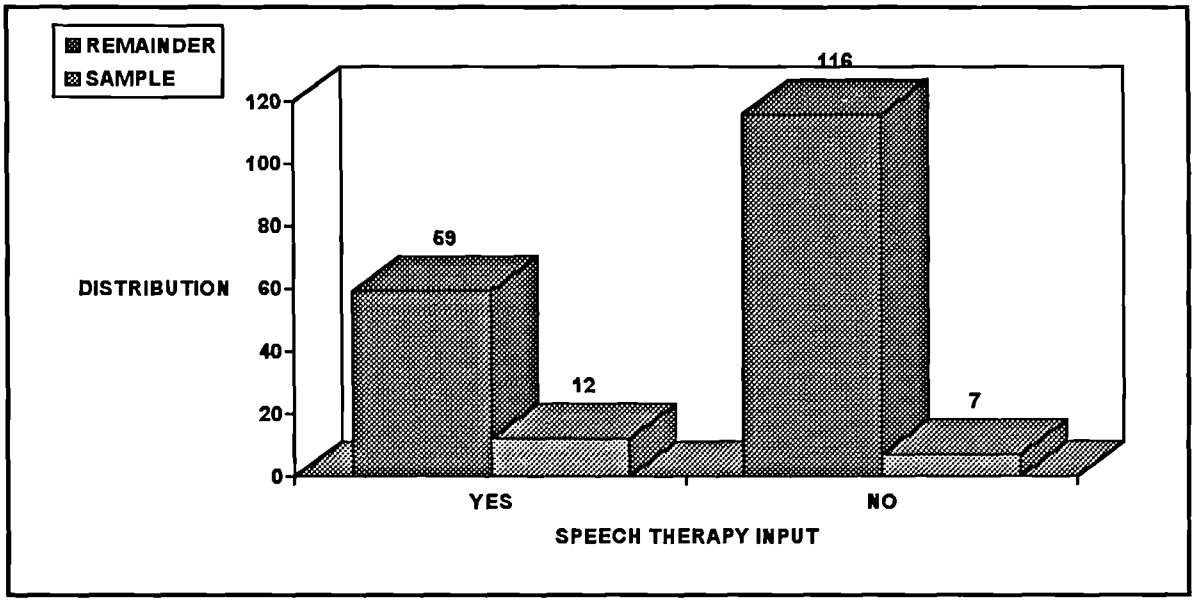

Figure B3.11 Speech and Language Therapy Input in Survey 2

Only 34% of the remainder of the population were reported as receiving Speech and language Therapy Input at the time of survey, as opposed to 63% of those meeting the sample population's criteria.

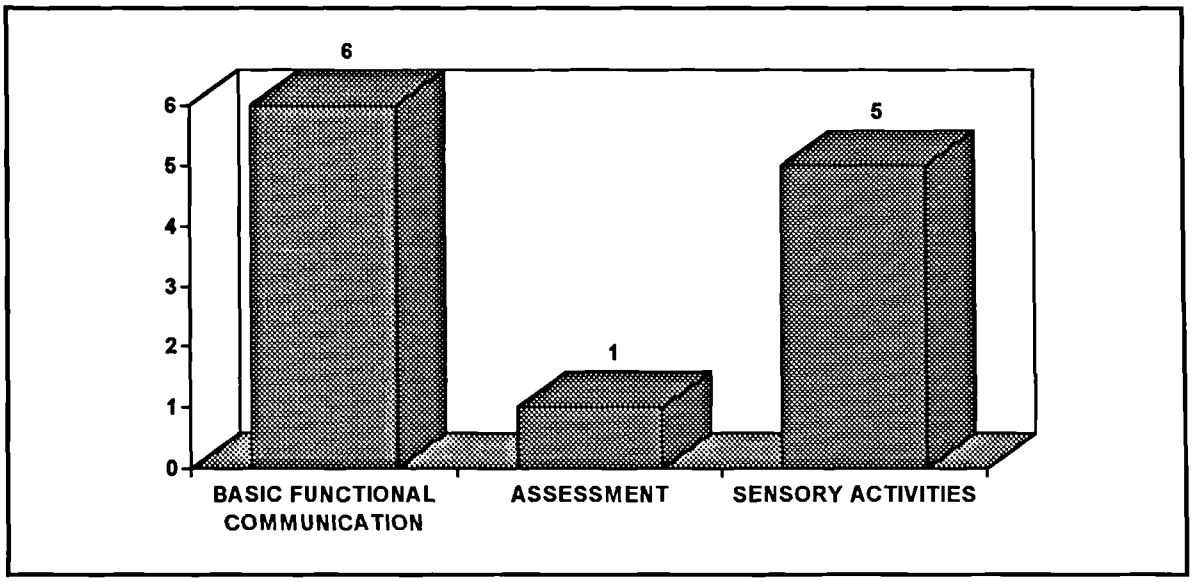

Figure B3.12 Type of Speech and Language Therapy Input to 'Sample' Population in Survey 2

Sensory activities were reported to be in use together with basic functional communication therapy. No operational definitions of intervention methods were reported to be in use.

KEY for SURVEY 1: Total Population (n) = 136; KEY for SURVEY 2: Total Population (n) = 194.

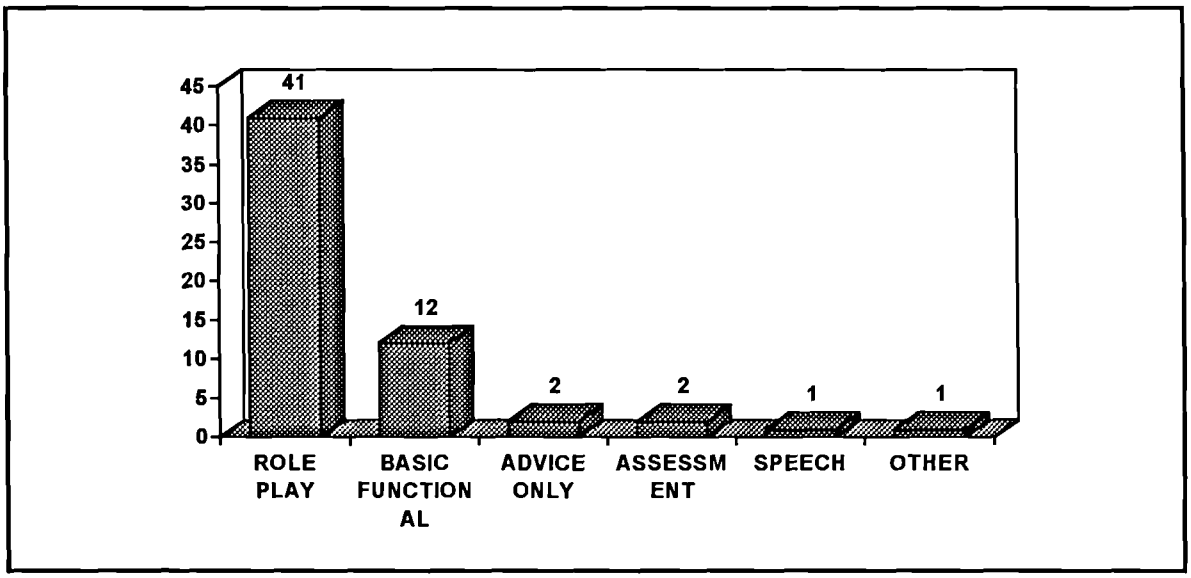

Figure B3.13 Type of Speech and Language Therapy Input to 'Remainder' of the Population in Survey 2

Again, interventions reflected the use of a number of professional skills but a lack of specifically defined interventions based on substantiated clinical rationales.

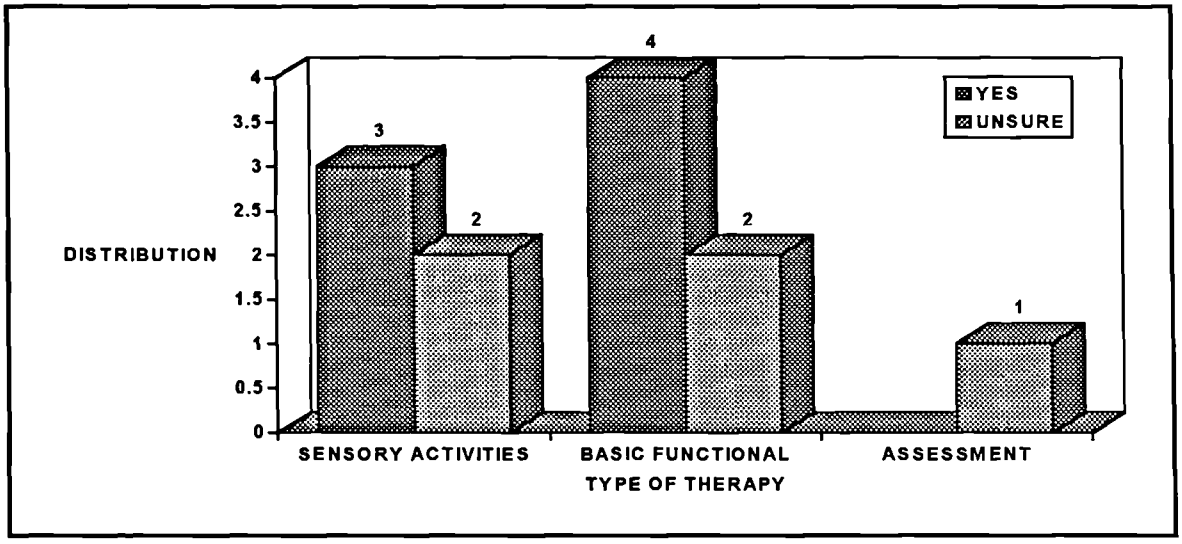

Figure B3.14 Expected Outcomes of Speech and Language Therapy Input to 'Sample' Population in Survey 2

Anticipated outcomes were largely based on the perceptions of the Speech and Language Therapist, the interventions being imprecise in their definitions, planning criteria and their objectives.

KEY for SURVEY 1: Total Population (n) = 136; KEY for SURVEY 2: Total Population (n) = 194.

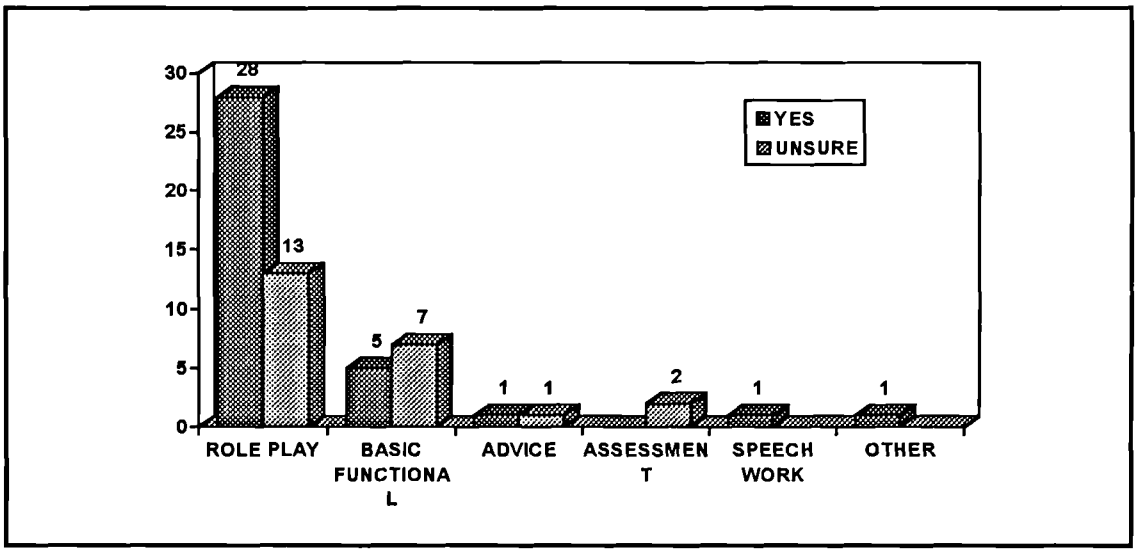

Figure B3.15 Expected Outcomes of Speech and Language Therapy Input to 'Remainder' of Population in Survey 2

Similar to the sample population, the anticipated outcomes of therapy for the remainder of the population was based on the therapist's own evaluations. The lack of clear prediction may be due to the imprecise nature of interventions.

KEY for SURVEY 1: Total Population (n) = 136; KEY for SURVEY 2: Total Population (n) = 194.

CASE HISTORY FORM

A. PERSONAL INFORMATION	
1. CLIENT'S NAME: _____	
SEX: _____	**SEX:** (1) M (2) F
2. D.O.B.: _____	**AGE RANGE:** (1) Up to 20 (2) 21 - 30 (3) 31 - 40 (4) 41 - 50 (5) 51 - 60 (6) 61 plus
3. ADDRESS: _____ _____ _____	**HOME ENVIRONMENT:** (1) Family home (2) Lodgings (3) Community home for < 6 (4) Hostel for > 7 (5) Hospital (6) Other
4. Has the client at any time in the past been resident in a long stay hospital?	**ENVIRONMENT HISTORY:** (1) Y (2) N (3) DNK
5. If **YES,** for how long approximately was the client resident?	(1) Less than a year (2) 1 - 5 years (3) 6 - 10 years (4) 11 plus years (5) DNK
B. FAMILY BACKGROUND	
1. Are the parents alive?	(1) M (2) F (3) DNK
2. Are there any siblings?	(1) Y (2) N (3) DNK
3. Is there a family history of a learning disability?	(1) Y (2) N (3) DNK
4. Is there a family history of psychiatric problems?	(1) Y (2) N (3) DNK

C. MEDICAL INFORMATION	
1. What is the aetiology of the learning disability?	(1) Down's syndrome (2) Infections (3) Peri/post natal trauma (4) Other (5) DNK (6) No information
2. Does the client suffer from epilepsy?	(1) Y (2) N (3) DNK
3. If **YES,** what is the type of epilepsy?	(1) Grand mal (2) Petit mal (3) DNK
4. What is the frequency of occurrence of the epilepsy?	(1) Daily (2) Weekly (3) Less than weekly
5. Is the client receiving regular medication?	(1) Anti-convulsant (2) Psychotrophic (3) Other (4) Combination (5) PRN only (6) None
D. SENSORY INFORMATION	
1. What is the client's vision like, with glasses if worn?	(1) Blind/almost blind bilaterally (2) Blind/almost blind unilaterally (3) Poor vision (4) Normal (5) DNK
2. Does the client have a hearing loss?	(1) Bilateral (2) Unilateral (3) Fluctuating (4) No (5) DNK
3. If **YES,** what is the severity of the hearing loss in the worst ear?	(1) Mild 30-40 dB (2) Moderate 40-50 dB (3) Severe 50-70 dB (4) Profound 70 plus dB

4. What type is the hearing loss?	(1) Conductive (2) Sensori-neural (3) Mixed (4) DNK
5. What aids have been prescribed and are worn?	(1) BE bilaterally (2) BE unilaterally (3) BW bilaterally (4) BW unilaterally (5) Other (6) None
E. PHYSICAL INDEPENDENCE	
1. Is the client able to walk unaided?	(1) Not at all (2) Not stairs (3) Everywhere
2. If **NOT AT ALL,** how dependent is the client in using the wheelchair?	(1) No (2) Not manage (3) Can manage
3. What practical aids does the client use for physical independence?	(1) Wheelchair (2) Walking frame (3) Eating/drinking aids (4) Special footwear (5) Other
F. PERSONAL NEEDS	
1. Does the client wet during the day?	**CONTINENCE:** (1) Frequently (2) Occasionally (3) Never
2. Does the client wet during the night?	(1) Frequently (2) Occasionally (3) Never
3. Does the client soil during the day?	(1) Frequently (2) Occasionally (3) Never
4. Does the client soil during the night?	(1) Frequently (2) Occasionally (3) Never

	SELF-HELP:
5. Does the client eat and drink independently, with aid if used?	(1) Not at all (2) With help (3) Independently
6. Does the client wash independently?	(1) Not at all (2) With help (3) Independently
7. Does the client dress independently?	(1) Not at all (2) With help (3) Independently
G. EDUCATIONAL BACKGROUND	
1. What educational establishment was attended for educational reasons for the majority of time up to 18 years of age?	(1) SLD school (2) MLD school (3) Integrated class (4) Normal school (5) Other (6) None (7) DNK
2. Can the client read?	(1) Not at all (2) A little (3) Newspapers
3. Can the client write?	(1) Not at all (2) A little (3) Own correspondence
4. Can the client use numeracy skills?	(1) Not at all (2) A little (3) Understands money
H. COMMUNICATION BACKGROUND	
1. Does the client have the use of spoken words, no matter how few?	(1) Yes (2) Used to (3) Never (4) DNK
2. Does the client have the use of Makaton signs, or similar, no matter how few?	(1) Yes (2) Used to (3) Never (4) DNK

3. Did the client receive speech therapy prior to entering adult services?	(1) Yes (2) No (3) DNK
4. If **YES,** of what duration was the period of speech therapy?	(1) Less than a year (2) More than a year (3) Intermittent (4) DNK
5. If **YES,** what type of speech therapy techniques were employed?	(1) Makaton (2) Symbols (3) Direct speech (4) Other (5) DNK
I. COMMUNITY LIVING SKILLS	
1. Can the client use a post office?	(1) Not at all (2) With help (3) Alone (4) No opportunity
2. Can the client use a telephone?	(1) Not at all (2) With help (3) Alone (4) No opportunity
3. Can the client use public transport?	(1) Not at all (2) With help (3) Alone (4) No opportunity

J. BEHAVIOUR PROBLEMS	
1. Which of the following items of behaviour are characteristic of the client?	*Use table below.*

ITEMS	FREQUENCY			SEVERITY		
	no	< mth	> mth	no	mini-mum	severe
a) Physical aggression to others						
b) Destructive to environment						
c) Overactive						
d) Self injurious behaviour (S.I.B.)						
e) Disturbing noises						
f) Temper tantrums						
g) Scatters/throws objects						
h) Stereotypic behaviour						
i) Inappropriate anal/oral behaviour						
j) Inappropriate masturbation (*in public*)						
k) Other (**specify*)						

K. SUPPORT REQUIRED	
1. What degree of staff support is required by client?	(1) Full-time (2) Part of the day (3) Minimal (4) None

Multi-Axial Case History Information: Table and Figures

A. PERSONAL INFORMATION	REMAINDER n	%	SAMPLE n	%	TOTAL n	%
Sex:						
(1) Male	67	58	10	48	77	56.5
(2) Female	48	42	11	52	59	43.5
Home Environment:						
(1) Family home	75	65	11	53	86	63
(2) Lodgings	7	6	0	0	7	5
(3) Community home for < 6	1	1	3	14	4	3
(4) Hostel for > 7	32	28	7	33	39	29
(5) Hospital	0	0	0	0	0	0
(6) Other	0	0	0	0	0	0
Institutional History:						
(1) Yes	8	7	7	33	15	11
(2) No	102	89	14	67	116	85
(3) Not known	5	4	0	0	5	4
Time in Institution						
(1) Less than a year	0	0	1	13	1	7
(2) 1 - 5 years	4	57	2	29	6	43
(3) 6 - 10 years	1	14	2	29	3	22
(4) 11 plus years	0	0	2	29	2	14
(5) Not known	2	29	0	0	2	14

Table B5.1 Summary Table of Personal Information from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

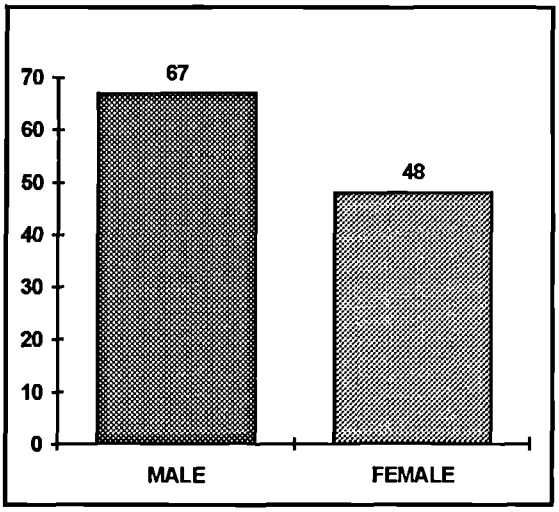

Figure B5.1: Distribution of Sex (R)

Males represented 58% and females 42%.

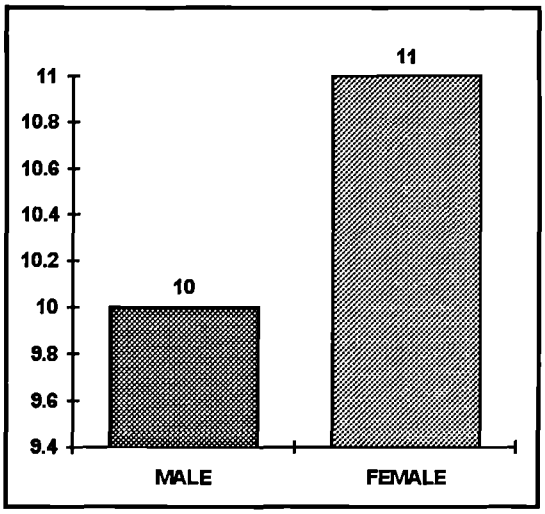

Figure B5.2: Distribution of Sex (S)

Males represented 48% and females were slightly higher at 52%.

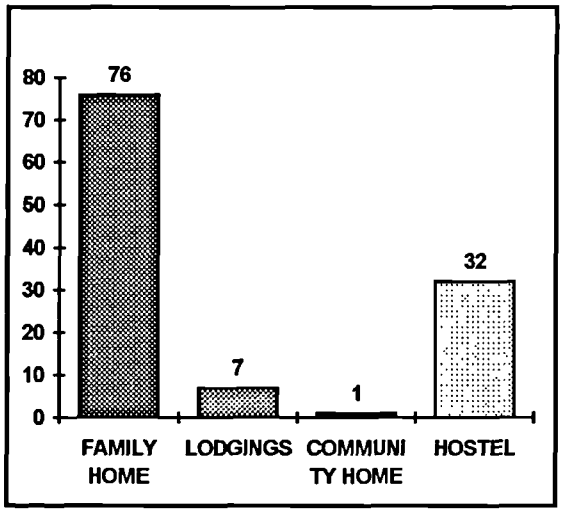

Figure B5.3: Home Environment (R)

The majority still lived in the family home or else a community hostel.

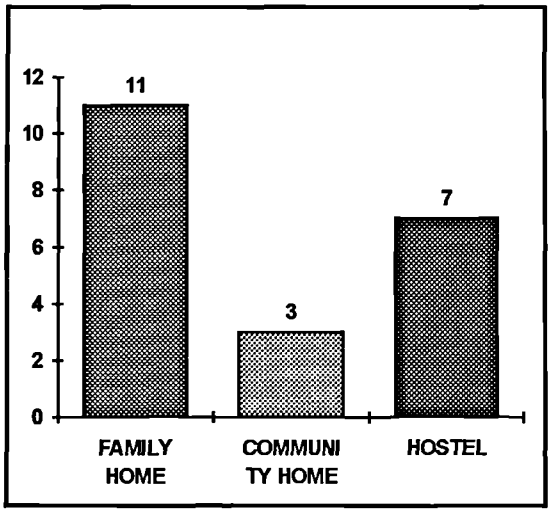

Figure B5.4: Home Environment(S)

The majority still lived in the family home or a community hostel.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

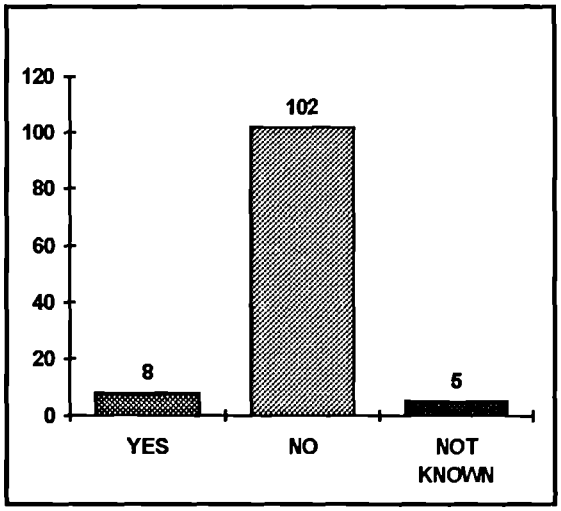

Figure B5.5: Institutional History (R)

The majority had not lived in an institution for the learning disabled.

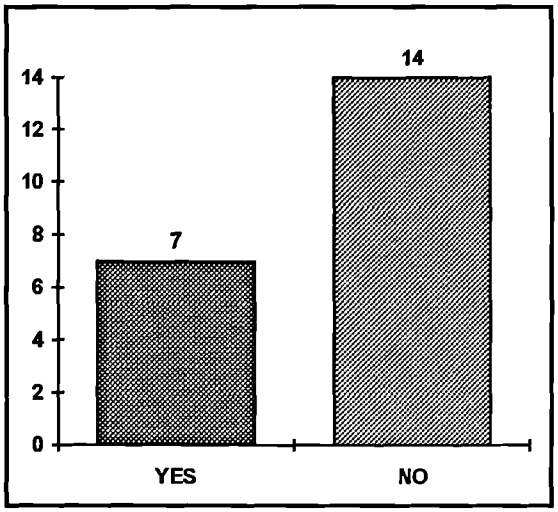

Figure B5.6: Institutional History (S)

A higher proportion of the sample had lived in an institution for the learning disabled (33%).

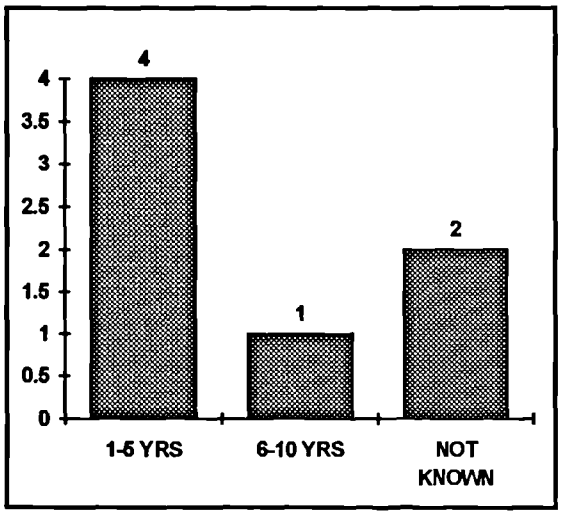

Figure B5.7: Period of Institutionalisation (R)

Of those who had spent time in an institution, the majority experienced stays that lasted under 5 years (57%).

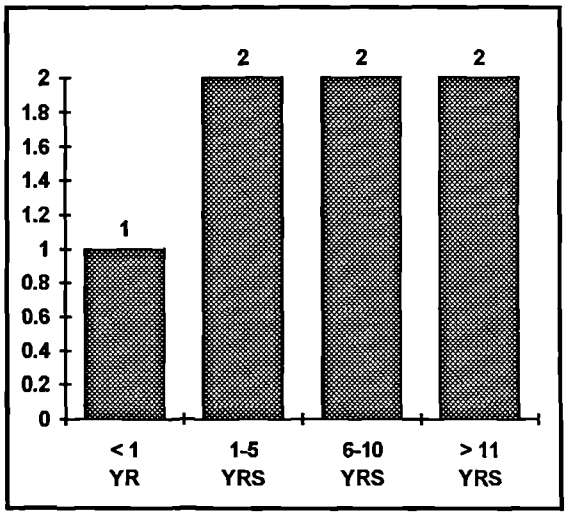

Figure B5.8: Period of Institutionalisation (S)

A higher proportion of the sample had experienced institutional stays of more than five years (58%).

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

Multi-Axial Case History Information: Table and Figures

B. FAMILY BACKGROUND	REMAINDER		SAMPLE		TOTAL	
	n	%	n	%	n	%
Parents Alive						
(1) Mother	101	88	21	100	122	90
(2) Father	69	60	18	86	87	64
(3) Not known	3	3	0	0	3	2
Siblings						
(1) Yes	100	87	17	80	117	86
(2) No	7	6	2	10	9	7
(3) Not known	8	7	2	10	10	7
Family history of a learning disability						
(1) Yes	8	7	3	14	11	8
(2) No	93	81	13	62	106	78
(3) Not known	14	12	5	24	19	14
Family history of psychiatric problems						
(1) Yes	4	3	1	5	5	4
(2) No	97	85	13	62	110	81
(3) Not known	14	12	7	33	21	15

Table B6.1 Summary Table of Family Background Information from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

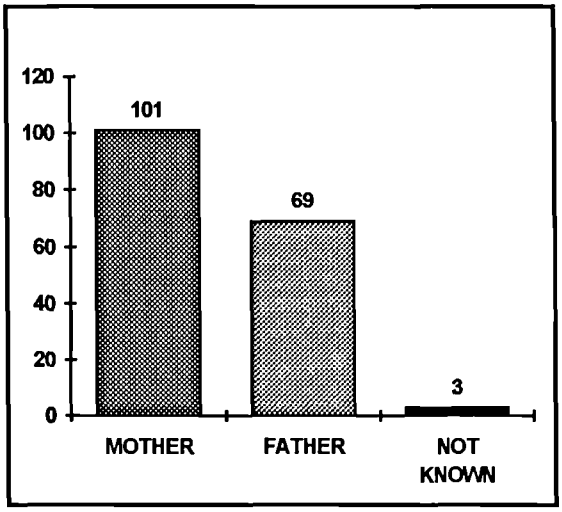

Figure B6.1: Parents Alive (R)

More mothers than fathers were reported to be alive.

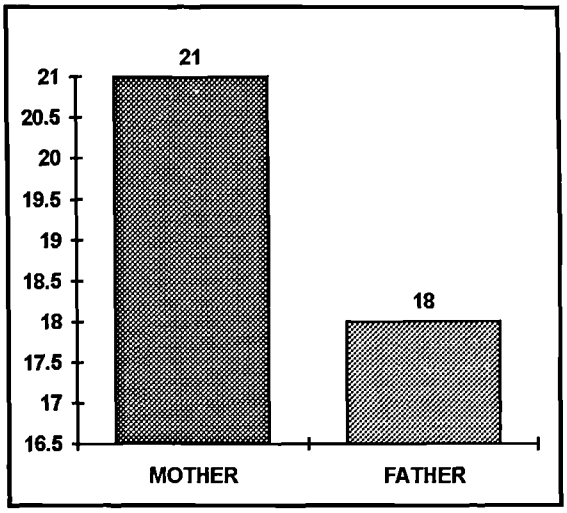

Figure B6.2: Parents Alive (S)

Similar to the remainder, there were more mothers than fathers reported living.

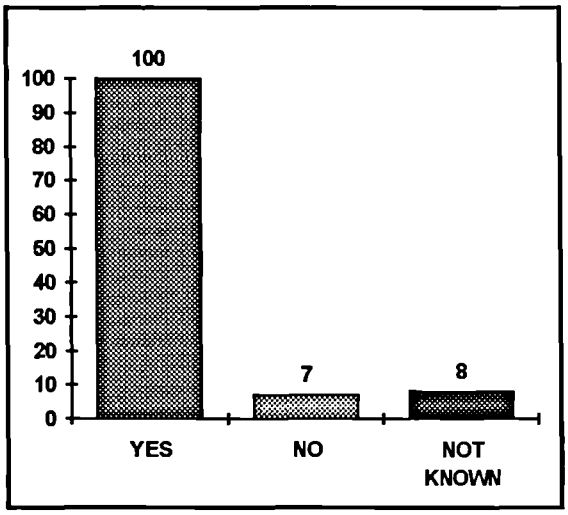

Figure B6.3: Siblings (R)

The majority of the remainder of the population had at least one sibling (87%).

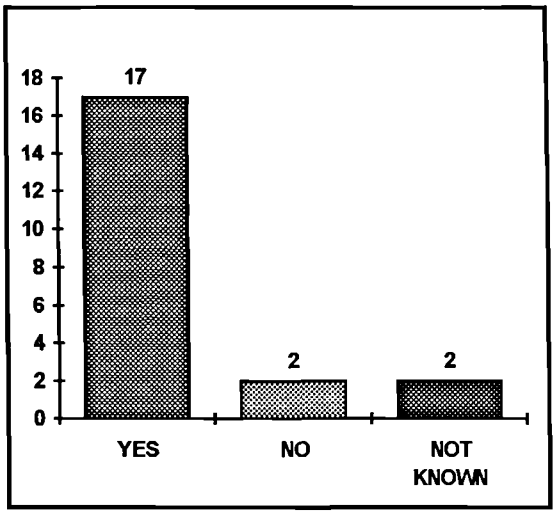

Figure B6.4: Siblings (S)

The majority of the sample of the population had at least one sibling (80%).

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

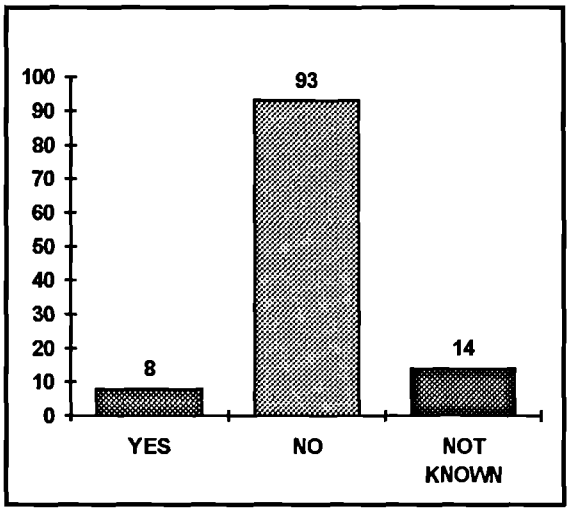

Figure B6.5: Family History of Learning Disability (R)

This was reported in just 7% of the cases in the remainder of the population.

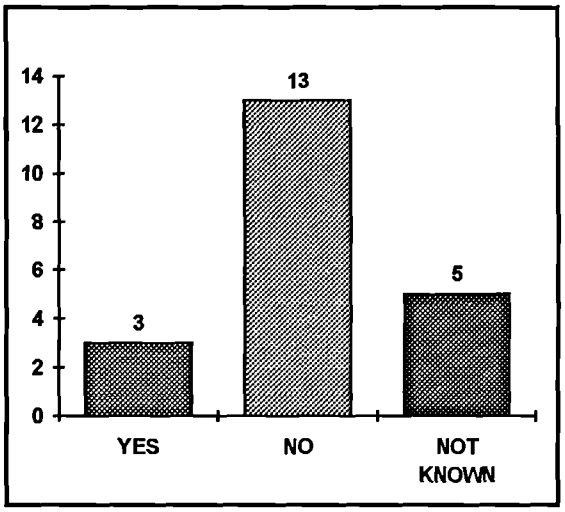

Figure B6.6: Family History of Learning Disability (S)

This was reported in a slightly higher proportion of the sample population (14%).

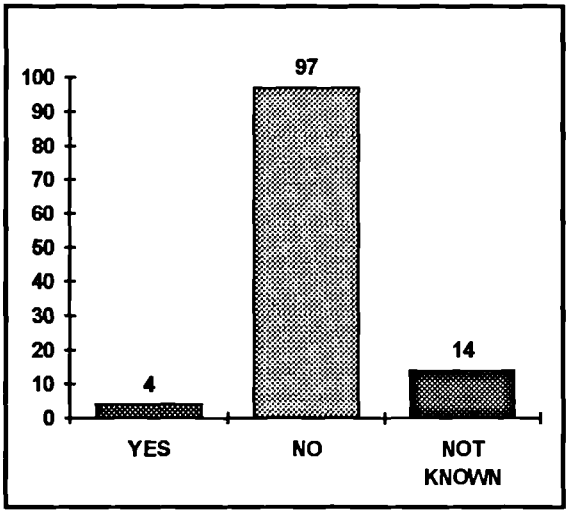

Figure B6.7: Family History of Psychiatric Problems (R)

This was reported for 3% of the remainder of the population.

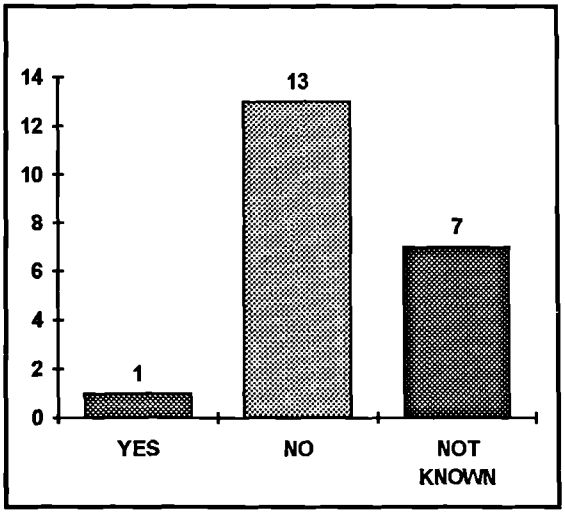

Figure B6.8: Family History of Psychiatric Problems (S)

This was reported for just 5% of the sample population.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

Summary of Multi-Axial Case History Information: Tables and Figures

C. MEDICAL INFORMATION	REMAINDER n	%	SAMPLE n	%	TOTAL n	%
Aetiology of the learning disability						
(1) Down's syndrome	40	35	2	10	42	31
(2) Infections	0	0	1	5	1	0.5
(3) Peri/post natal trauma	4	3	4	19	8	6
(4) Other	9	8	4	19	13	9.5
(5) Not known	18	16	4	19	22	16
(6) No information	44	38	6	28	50	37
Epilepsy						
(1) Yes	19	17	9	43	28	20.5
(2) No	96	83	11	52	107	79
(3) Not known	0	0	1	5	1	0.5
Type of epilepsy						
(1) Grand mal	10	53	5	56	15	53.5
(2) Petit mal	5	26	3	33	8	28.5
(3) Not known	4	21	1	11	5	18
Frequency of occurrence						
(1) Daily	0	0	1	13	1	4
(2) Weekly	7	88	3	38	10	38.5
(3) Less than weekly	1	12	4	49	15	57.5
Medication						
(1) Anti-convulsant	18	16	8	37	26	19
(2) Psychotrophic	6	5	1	5	7	5
(3) Other	9	8	2	10	11	8
(4) Combination	0	0	1	5	1	0.5
(5) PRN only	8	7	1	5	9	7
(6) None	74	64	8	38	82	60.5

Table B7.1 Summary Table of Medical Information from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

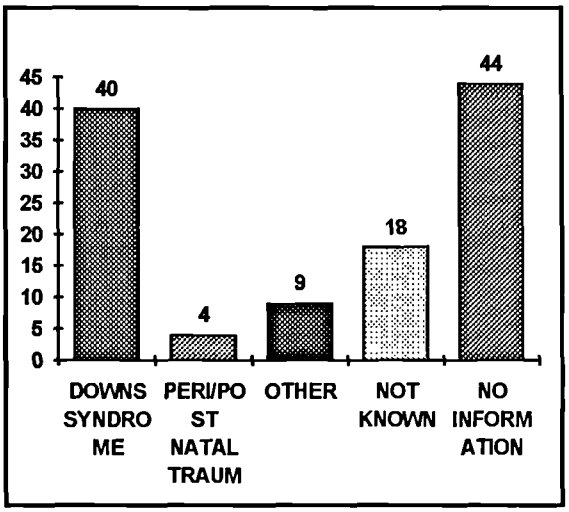

Figure B7.1: Aetiology of Learning Disability (R)

The most frequently known aetiology reported was Down's Syndrome.

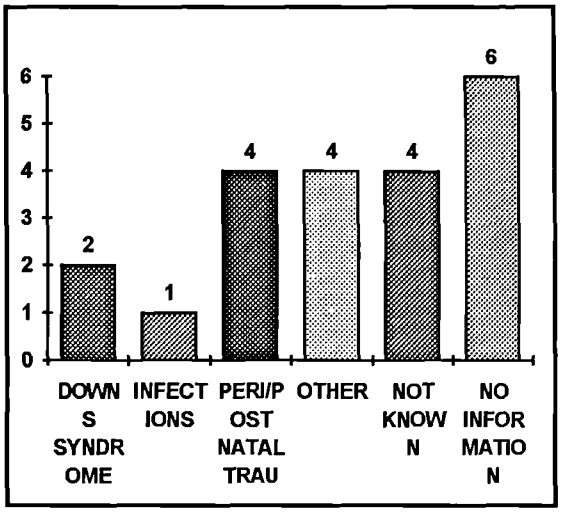

Figure B7.2: Aetiology of Learning Disability (S)

Peri/post natal trauma was the most frequently reported cause of learning disability.

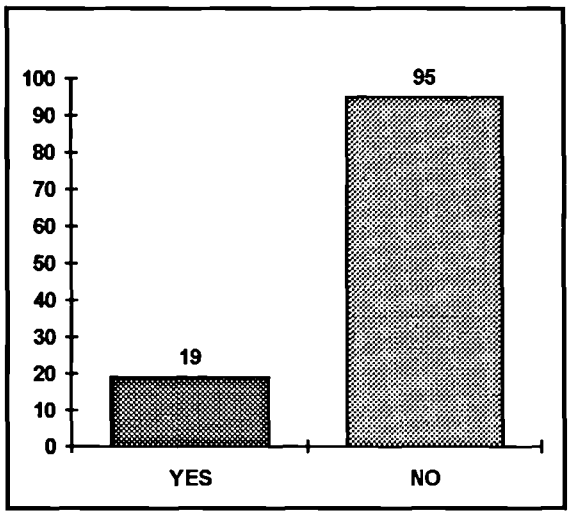

Figure B7.3: Incidence of Epilepsy (R)

17% of the remainder of the population were reported to experience epileptic seizures.

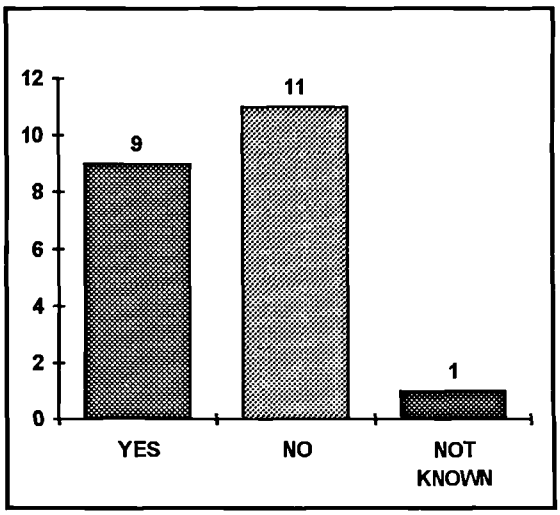

Figure B7.4: Incidence of Epilepsy (S)

A significantly higher proportion of the sample were reported to experience epileptic seizures (43%), probably commensurate with the more severe learning disability and other impairments.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

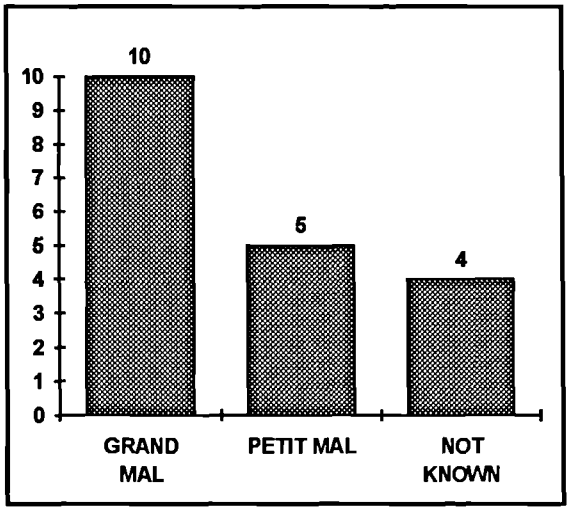

Figure B7.5: Type of Epilepsy (R)

Of those who had spent time in an institution, the majority experienced stays that lasted under 5 years (57%).

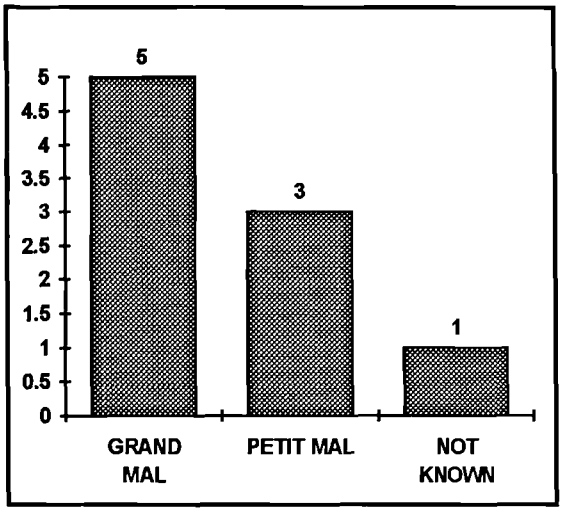

Figure B7.6: Type of Epilepsy (S)

A higher proportion of the sample experienced grand mal seizures (58%).

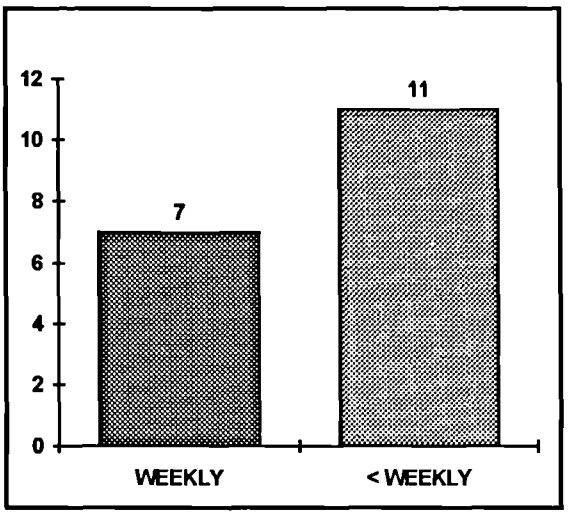

Figure B7.7: Frequency of Epilepsy (R)

Epileptic seizures were less frequent for the remainder of the population.

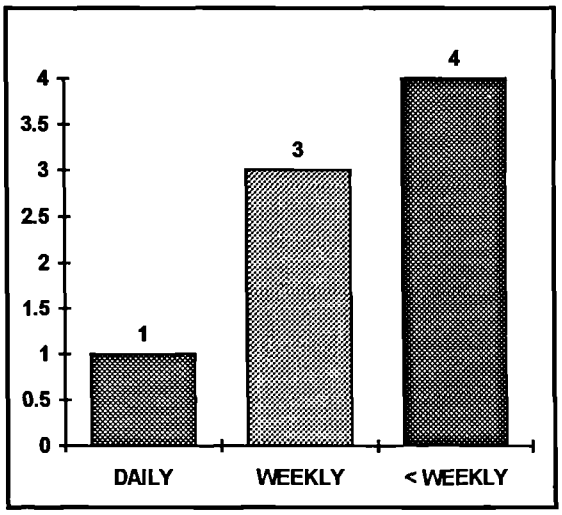

Figure B7.8: Frequency of Epilepsy (S)

The frequency of seizure was higher for the sample population. This is probably commensurate with the severity of the learning disability.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

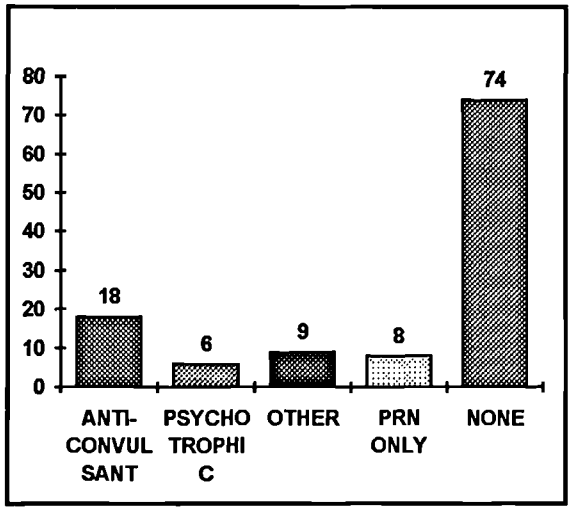

Figure B7.9: Medication Taken (R)

A small percentage took anti-convulsant medication (37%). The majority did not take any.

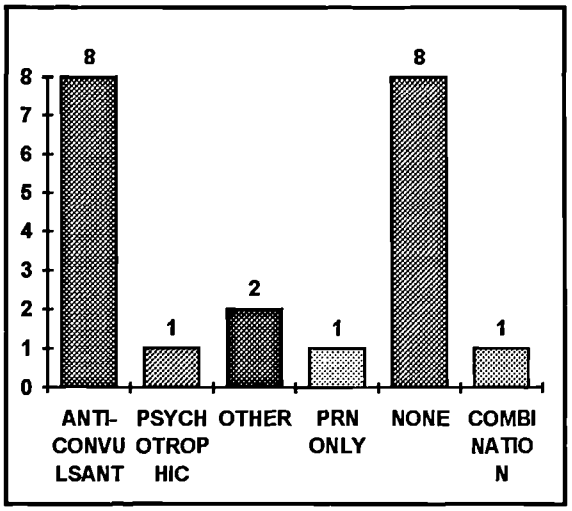

Figure B7.10: Medication Taken (S)

Anti-convulsant medication was the most frequently prescribed drug.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

Summary of Multi-Axial Case History Information: Tables and Figures

D. SENSORY INFORMATION	REMAINDER n	%	SAMPLE n	%	TOTAL n	%
Visual acuity						
(1) Blind/almost blind bilaterally	0	0	0	0	0	0
(2) Blind/almost blind unilaterally	2	2	0	0	2	1
(3) Poor vision	18	16	2	10	20	15
(4) Normal	88	75	11	57	99	73
(5) Not known	7	7	8	33	15	11
Hearing loss						
(1) Bilateral	15	13	4	19	19	14
(2) Unilateral	2	2	0	0	2	1
(3) Fluctuating	4	3	0	0	4	3
(4) No	59	52	5	24	64	47
(5) Not known	35	30	12	57	47	35
Severity of hearing loss in worst ear						
(1) Mild 30-40 dB	7	33	2	50	9	36
(2) Moderate 40-50 dB	10	48	0	0	10	40
(3) Severe 50-70 dB	2	9	1	25	3	12
(4) Profound 70 plus dB	2	10	1	25	3	12
Type of hearing loss						
(1) Conductive	13	62	2	50	15	60
(2) Sensori-neural	2	9	1	25	3	12
(3) Mixed	5	24	0	0	5	20
(4) Not known	1	5	1	25	2	18
Aids prescribed and worn						
(1) BE bilaterally	1	5	1	25	2	8
(2) BE unilaterally	11	52	1	25	12	48
(3) BW bilaterally	0	0	0	0	0	0
(4) BW unilaterally	0	0	0	0	0	0
(5) Other	0	0	0	0	0	0
(6) None	9	43	2	50	11	44

Table B8.1 Summary Table of Sensory Information from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

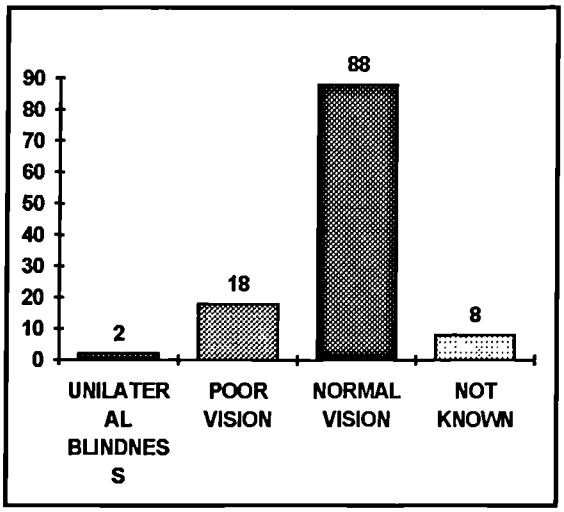

Figure B8.1: Visual Acuity (R)

There was no reliable assessment data available for 7% of the remainder. Evidence of assessment for those identified as having *normal vision* was not present.

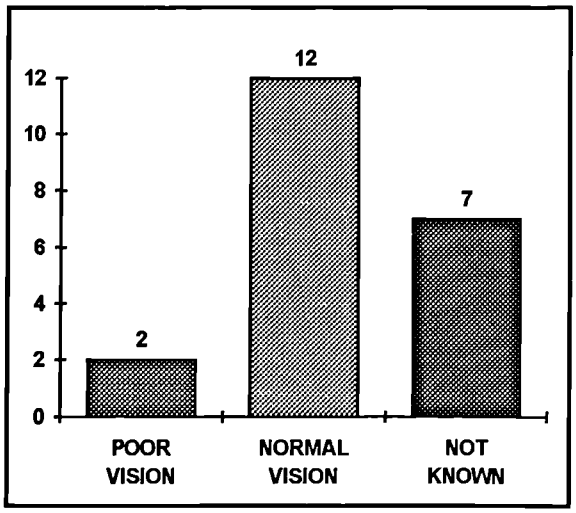

Figure B8.2: Visual Acuity (S)

There was no reliable assessment data available for 33% of the sample population. Presumably the majority of the sample would requires assessment by electro-physiological means. Evidence of assessment for those identified as having *normal vision* was not present.

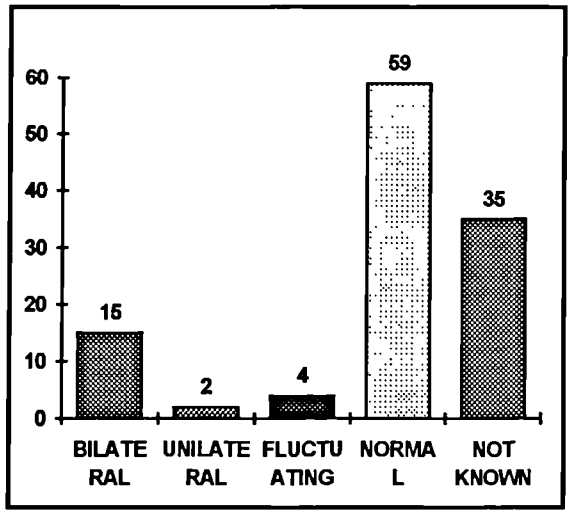

Figure B8.3: Hearing Impairment (R)

18% were diagnosed to have a hearing loss. 35 participants were still on the waiting list.

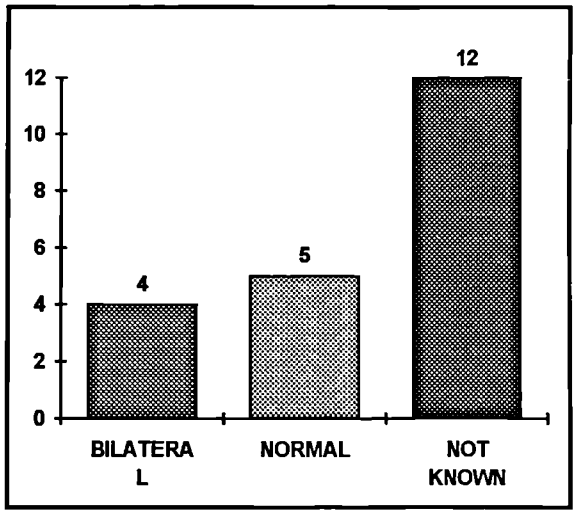

Figure B8.4: Hearing Impairment (S)

12 participants were awaiting audiometric assessment by electro-physiological means (57%).

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

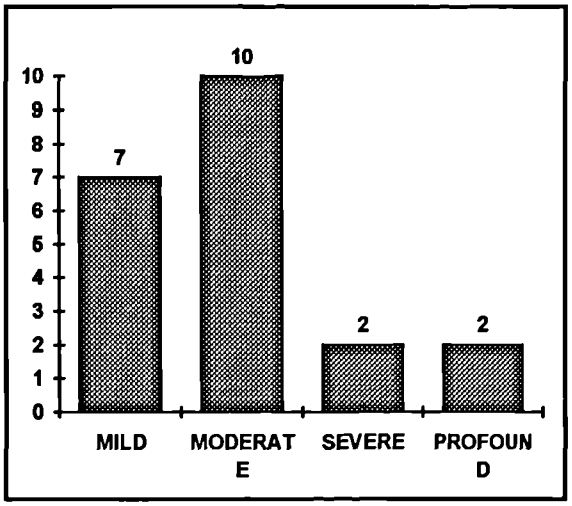

Figure B8.5: Degree of Hearing Loss (R)

The majority with a diagnosed hearing loss fell within the mild to moderate range.

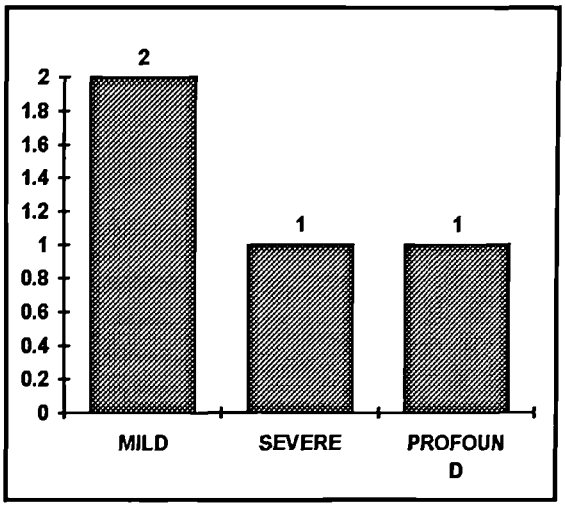

Figure B8.6: Degree of Hearing Loss (S)

Two participants with a diagnosed hearing loss fell within the severe to profound range.

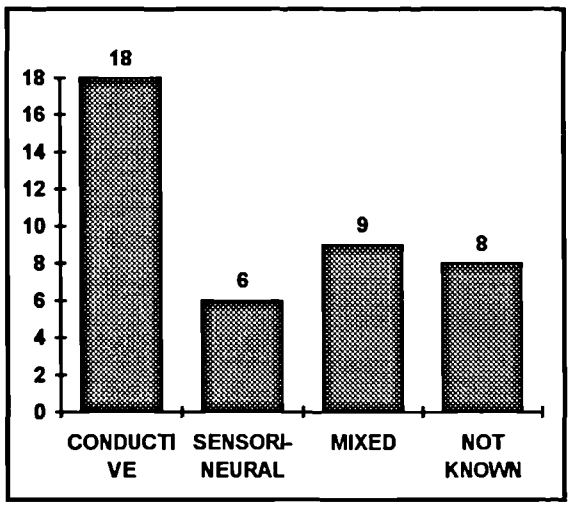

Figure B8.7: Type of Hearing Loss (R)

The majority had conductive or mixed losses. These types of loss have been associated with Down's Syndrome, which accounted for 35% of the subject's aetiologies of learning disability in the remainder.

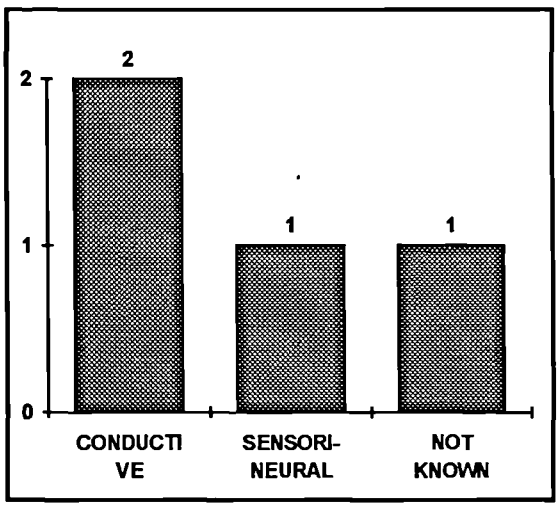

Figure B8.9: Type of Hearing Loss (S)

These results are not conclusive due to missing data.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

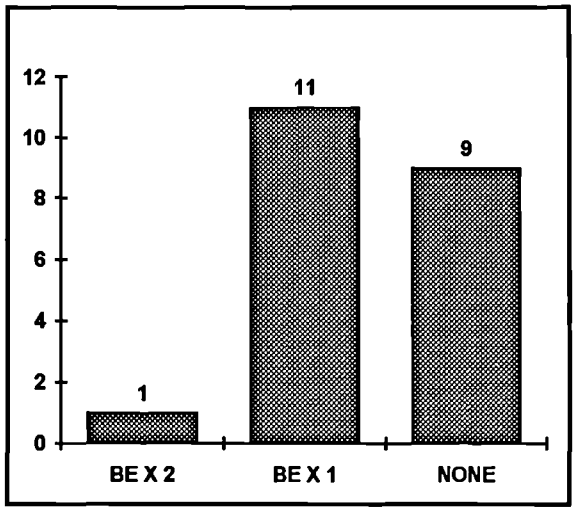

Figure B8.10: Hearing Aid(s) Prescribed and Worn (R)

One participant wore two commercially purchased aids. The majority wore just one hearing aid. nine participants were not using their prescribed aid for a variety of reasons.

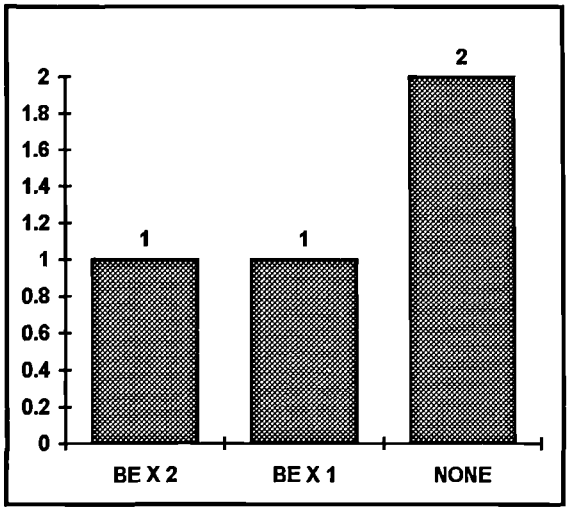

Figure B8.11: Hearing Aid(s) Prescribed and Worn (S)

One participant wore two hearing aids. One participant wore one hearing aid although inconsistently. Two participants had not been prescribed a hearing aid.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

Summary of Multi-Axial Case History Information: Tables and Figures

E. PHYSICAL INDEPENDENCE	REMAINDER		SAMPLE		TOTAL	
	n	%	n	%	n	%
Walk unaided						
(1) Not at all	1	1	3	14	4	3
(2) Not stairs	1	1	3	14	4	3
(3) Everywhere	113	98	15	72	128	94
Independent use of wheelchair for Mobility						
(1) No	0	0	1	33	1	25
(2) Not manage	0	0	2	67	2	50
(3) Can manage	1	100	0	0	1	25
Practical aids for physical independence						
(1) Wheelchair	2	2	3	14	5	4
(2) Walking frame	1	1	1	5	2	1.5
(3) Eating/drinking aids	0	0	2	9.5	2	1.5
(4) Special footwear	1	1	3	14	4	3
(5) Other	2	2	1	5	3	2

Table B9.1 Summary Table of Information Regarding Physical Independence from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

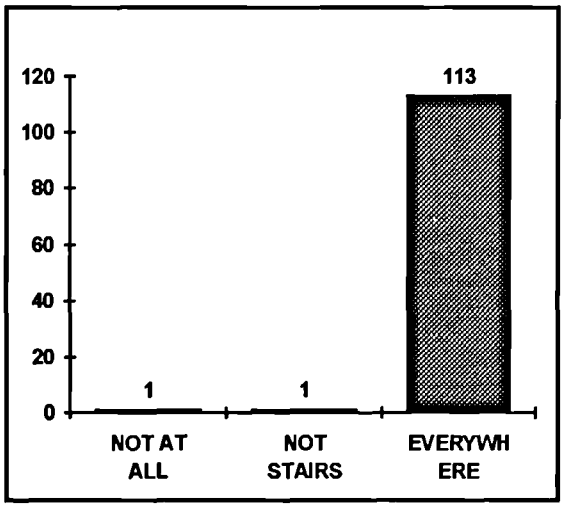

Figure B9.1: Walking Unaided (R)

The majority were fully mobile apart from one independent wheelchair user and on participant who required support on stairways.

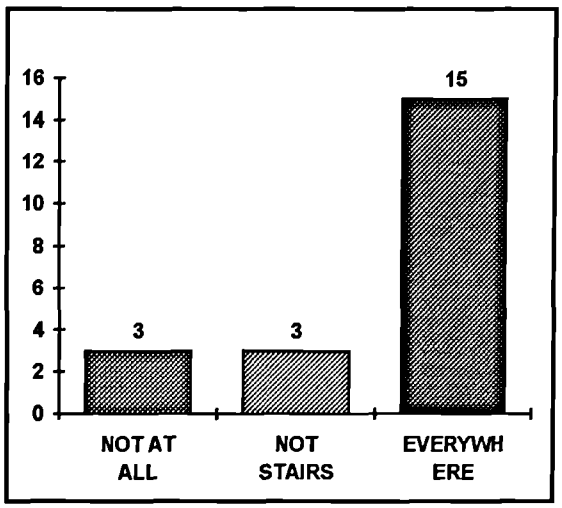

Figure B9.2: Walking Unaided (S)

Three participants were wheelchair users and three others required support on stairways.

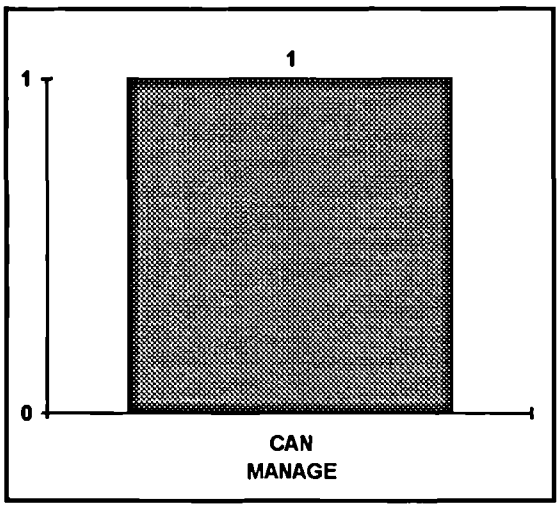

Figure B9.3: Independent Use of Wheelchair for Mobility (R)

The one participant who used a wheelchair was able to propel herself.

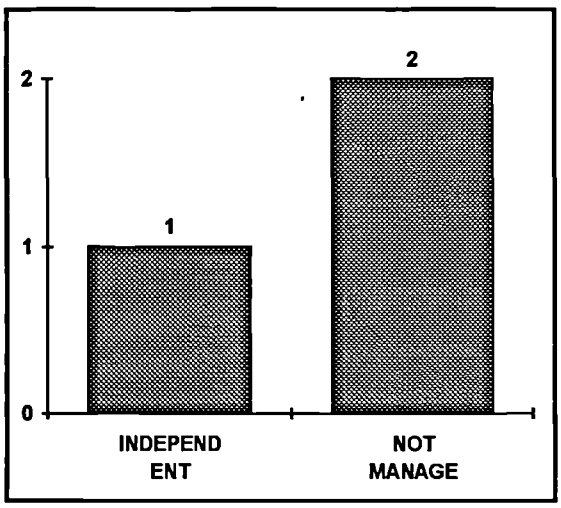

Figure B9.4: Independent Use of Wheelchair for Mobility (S)

Two participants were dependent on others to propel their wheelchairs.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

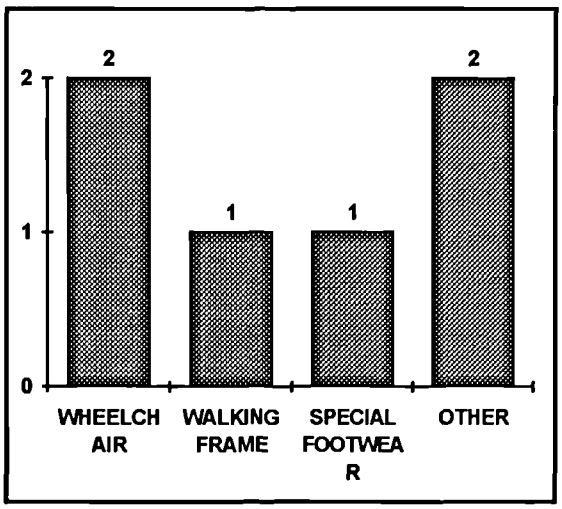

Figure B9.5: Aids to Physical Independence (R)

Only six participants used practical aids to physical independence.

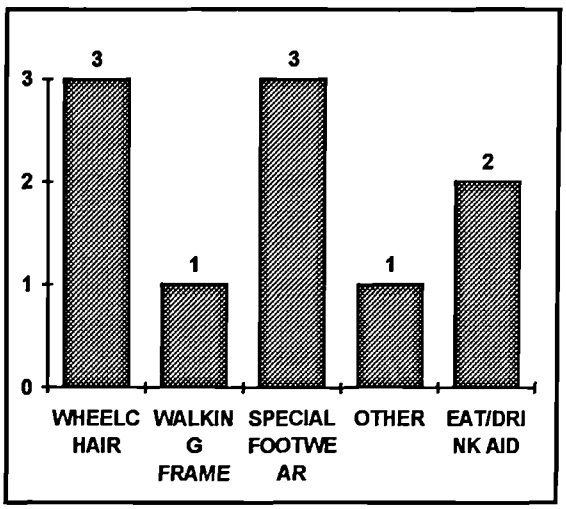

Figure B9.6: Aids to Physical Independence (S)

A higher proportion of the sample used aids to physical independence due to motor problems experienced.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

Summary of Multi-Axial Case History Information: Tables and Figures

F. PERSONAL NEEDS	REMAINDER		SAMPLE		TOTAL	
	n	%	n	%	n	%
Daytime enuresis						
(1) Frequently	1	1	3	14	4	.3
(2) Occasionally	3	3	11	53	14	10
(3) Never	111	96	7	33	118	87
Nocturnal enuresis						
(1) Frequently	2	2	6	29	8	6
(2) Occasionally	7	6	10	47	17	12.5
(3) Never	106	92	5	24	111	81.5
Daytime soiling						
(1) Frequently	1	1	3	14	4	3
(2) Occasionally	2	2	8	38	10	7.5
(3) Never	112	97	10	48	122	89.5
Nocturnal soiling						
(1) Frequently	2	2	6	29	8	6
(2) Occasionally	3	3	6	29	9	6.5
(3) Never	110	95	9	42	119	87.5
Eating & drinking						
(1) Not at all	0	0	3	14	3	2
(2) With help	2	2	7	33	9	6.5
(3) Independently	113	98	11	53	124	91.5
Wash routine						
(1) Not at all	1	1	6	29	6	4.5
(2) With help	23	20	15	71	38	28
(3) Independently	91	79	0	0	92	67.5
Dressing						
(1) Not at all	1	1	5	24	6	4.5
(2) With help	23	20	15	71	38	28
(3) Independently	91	79	1	5	92	67.5

Table B10.1 Summary Table of Personal Needs from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

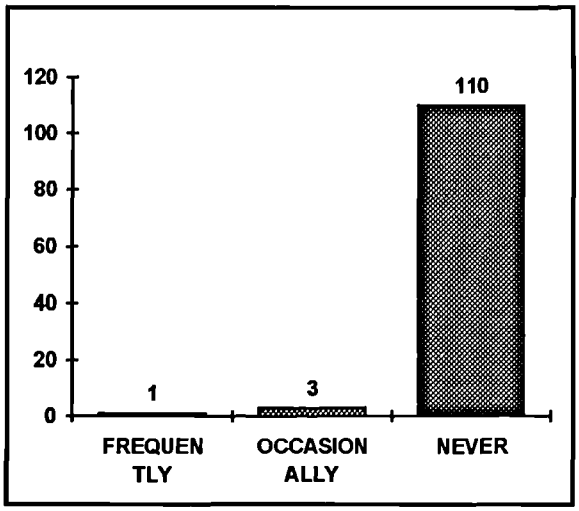

Figure B10.1: Daytime Enuresis (R)

The level of continence was high amongst the remainder of the population.

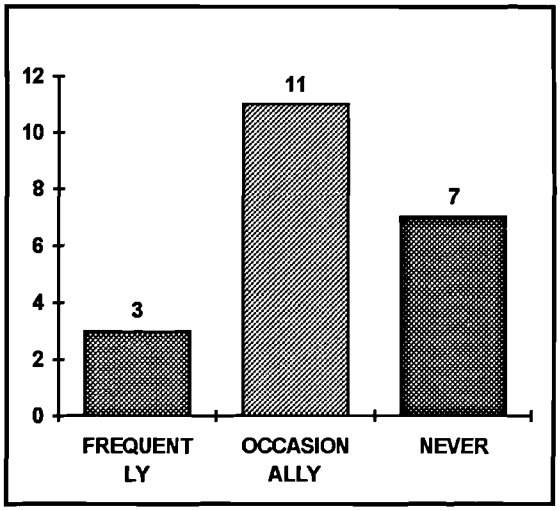

Figure B10.2: Daytime Enuresis (S)

The sample population showed a high level of daytime enuresis which probably relates to degree of learning disability and associated physical disabilities.

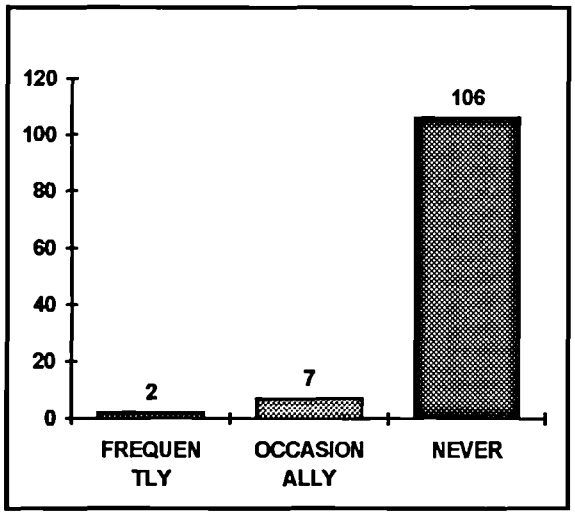

Figure B10.3: Nocturnal Enuresis (R)

Only nine participants experienced night-time incontinence to various degrees.

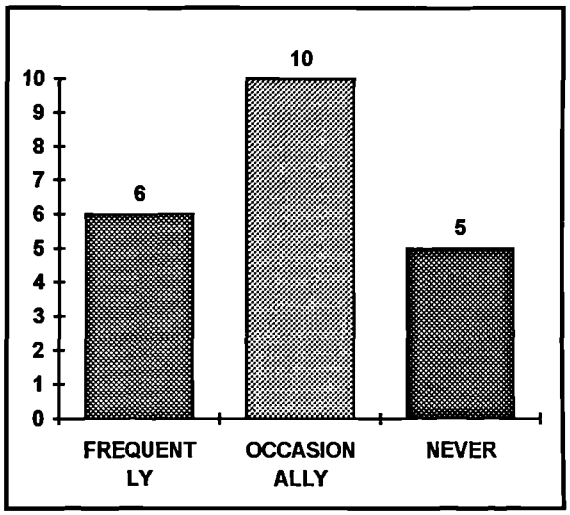

Figure B10.4: Nocturnal Enuresis (S)

The level of night-time enuresis was slightly higher than for day time.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

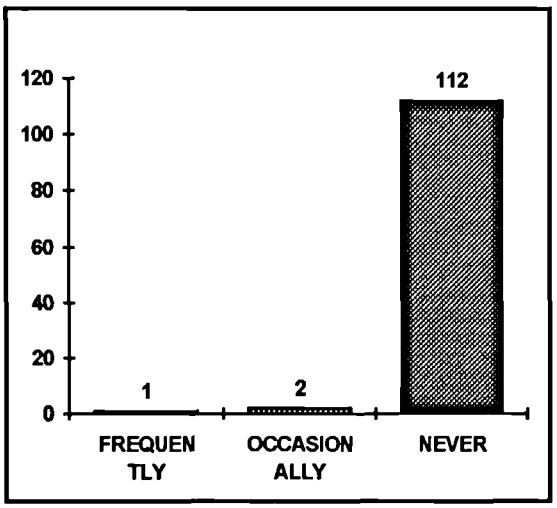

Figure B10.5: Daytime Soiling (R)

The one participant who soiled during the day had spina bifida which resulted in a severe lack of motor control below the waist line.

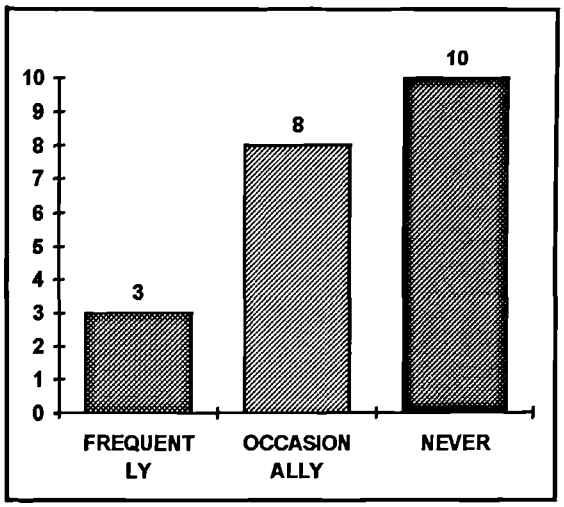

Figure B10.6: Daytime Soiling (S)

Three participants soiled during the day. This was associated with a lack of motor function.

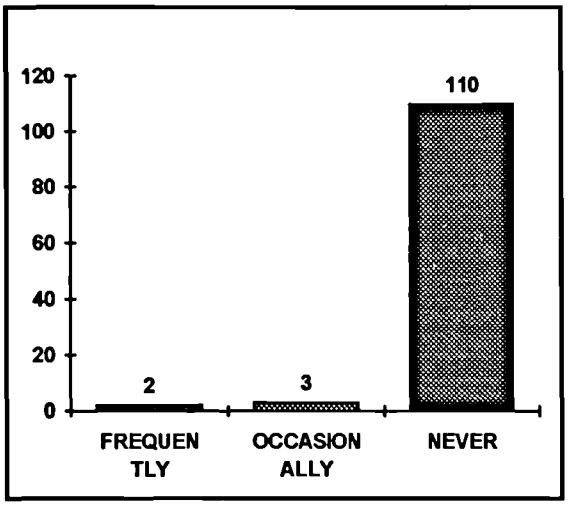

Figure B10.7: Nocturnal Soiling (R)

This was still at a lower level than for the sample population.

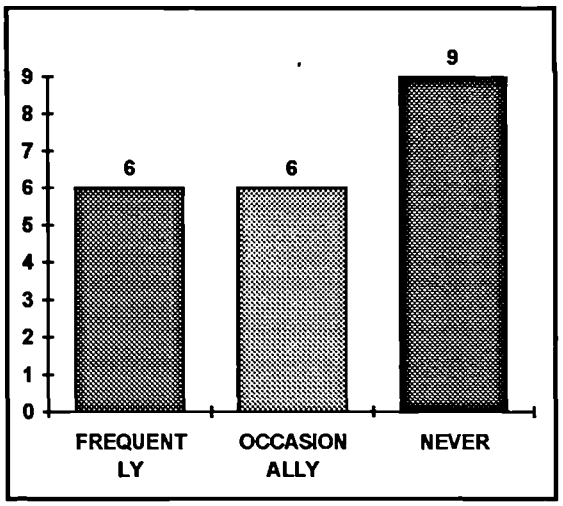

Figure B10.8: Nocturnal Soiling (S)

Nocturnal soiling was slightly higher than for during the day.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

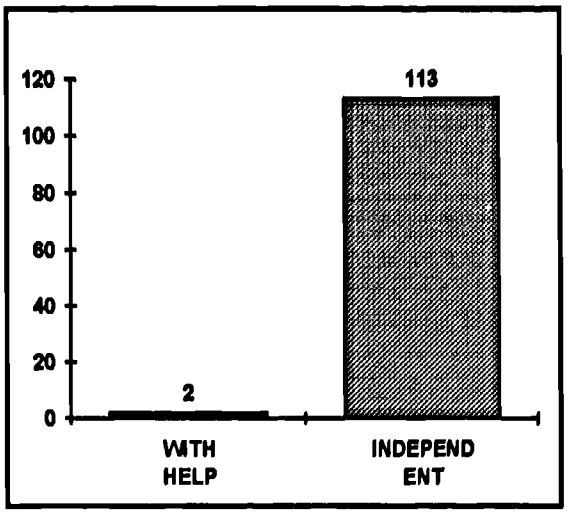

Figure B10.9: Independent Eating and Drinking (R)

The majority were able to eat and drink independently.

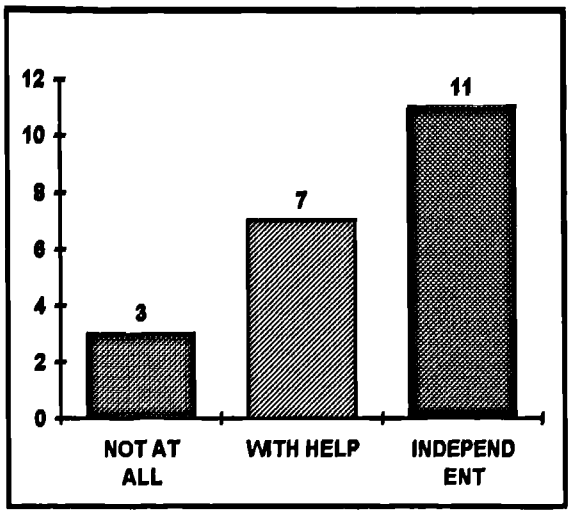

Figure B10.10: Independent Eating and Drinking (S)

Out of all the self-help skills surveyed, eating and drinking was the most independently exercised by the sample population. Self-gratification by food or drink consumption is probably a factor.

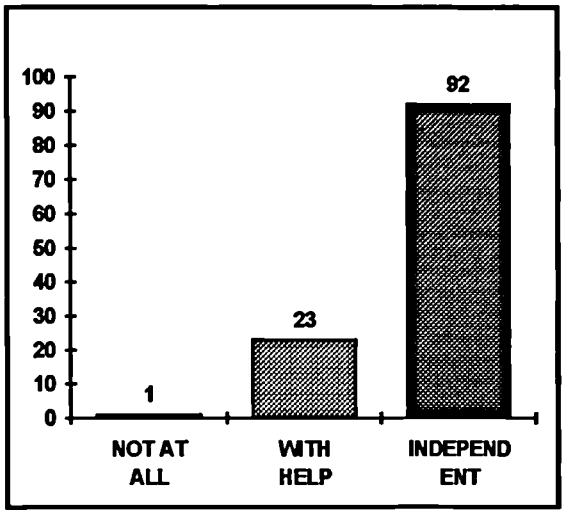

Figure B10.11: Independent Wash Routine (R)

The one participant who was totally dependent on the help of others was severely physically disabled.

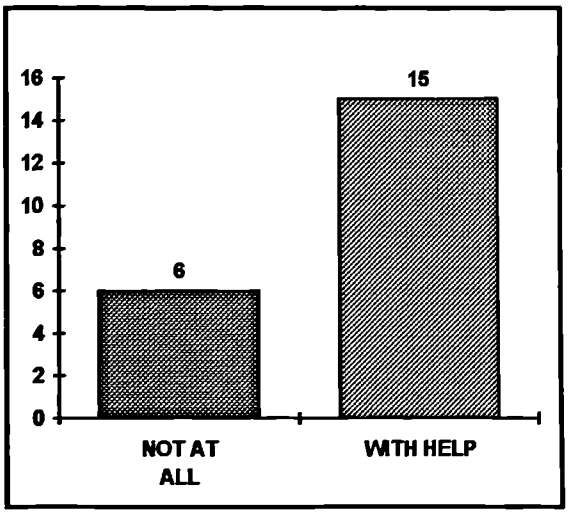

Figure B10.12: Independent Wash Routine (S)

The majority required help, the rest were totally dependent on significant others for execution of routine.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

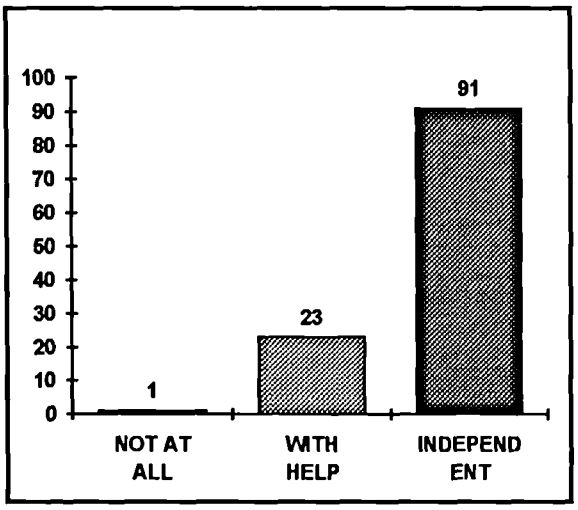

Figure B10.13: Independent Dressing (R)

Again, the one participant who was totally dependent on the help of others was severely physically disabled.

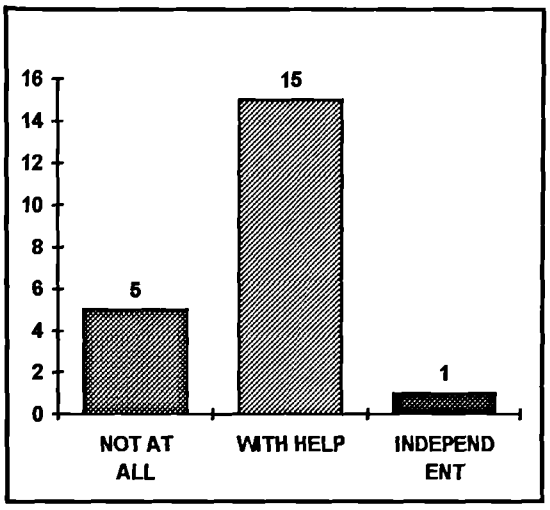

Figure B10.14: Independent Dressing (S)

The majority required help, the rest were totally dependent on significant others for execution of routine. One participant was reportedly independent with verbal support.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

Summary of Multi-Axial Case History Information: Tables and Figures

G. EDUCATIONAL BACKGROUND	REMAINDER		SAMPLE		TOTAL	
	n	%	n	%	n	%
Educational establishment						
(1) SLD school	91	79	19	90	110	81
(2) MLD school	14	12	0	0	14	10
(3) Integrated class	0	0	0	0	0	0
(4) Normal school	1	1	0	0	1	0.5
(5) Other	8	7	1	5	9	7
(6) None	0	0	0	0	0	0
(7) Not known	1	1	1	1	2	1.5
Reading skills						
(1) Not at all	46	40	21	100	67	49
(2) A little	57	50	0	0	57	42
(3) Newspapers	12	10	0	0	12	9
Writing skills						
(1) Not at all	42	37	21	100	63	46
(2) A little	61	53	0	0	61	45
(3) Own correspondence	12	10	0	0	12	9
Numeracy skills						
(1) Not at all	40	35	21	100	61	45
(2) A little	54	47	0	0	54	39.5
(3) Understands money	21	18	0	0	21	15.5

Table B11.1 Summary Table of Educational Background from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

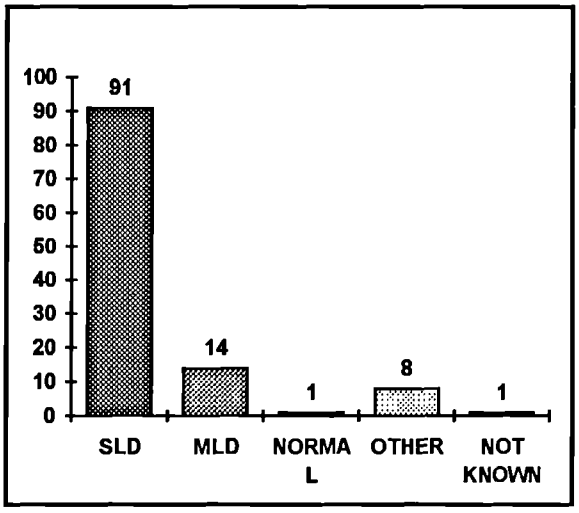

Figure B11.1: Educational Establishment Attended (R)

The majority had attended schools for the severely learning disabled. 14 participants had attended schools for the moderately learning disabled. Other schools attended were for the: autistic; deaf. One participant had attended a normal school.

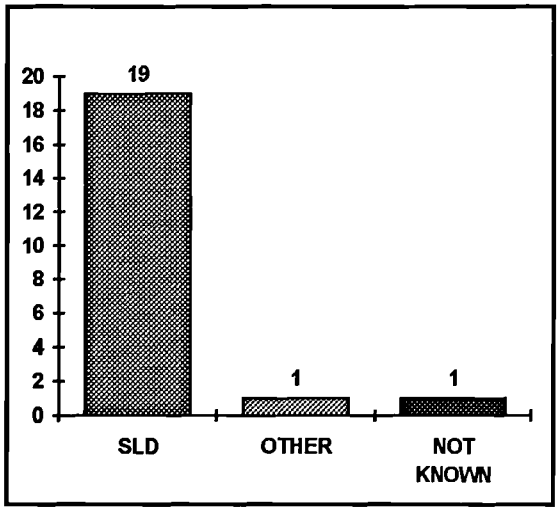

Figure B11.2: Educational Establishment Attended (S)

The majority had attended schools for the severely learning disabled. One participant had been at a school for autistic children.

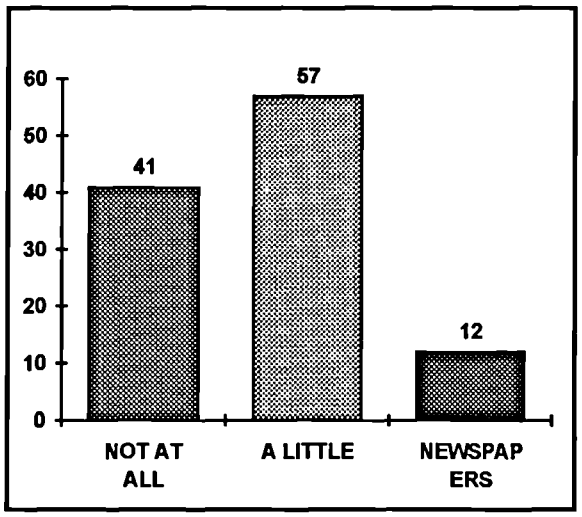

Figure B11.3: Reading Skills (R)

Only 40% had no reading skills at all.

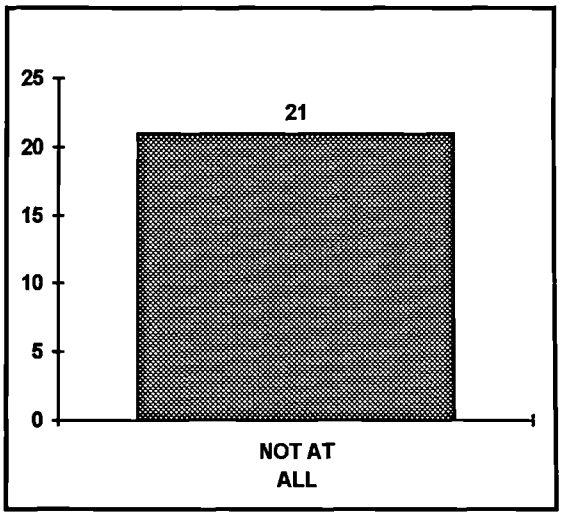

Figure B11.4: Reading Skills (S)

Reading skills were not in evidence.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

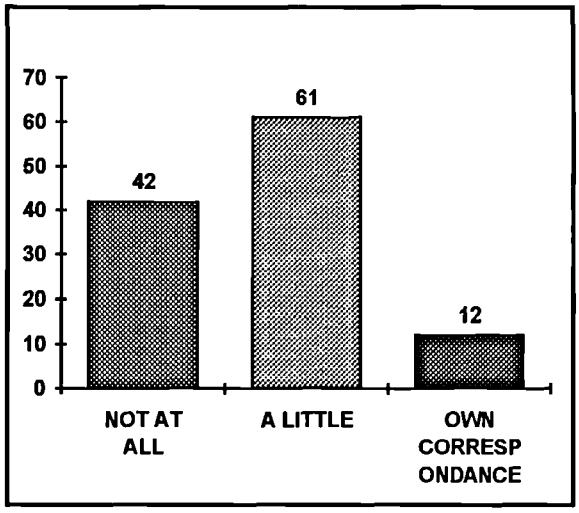

Figure B11.5: Writing Skills (R)

Only 37% were reported to be unable to write at all.

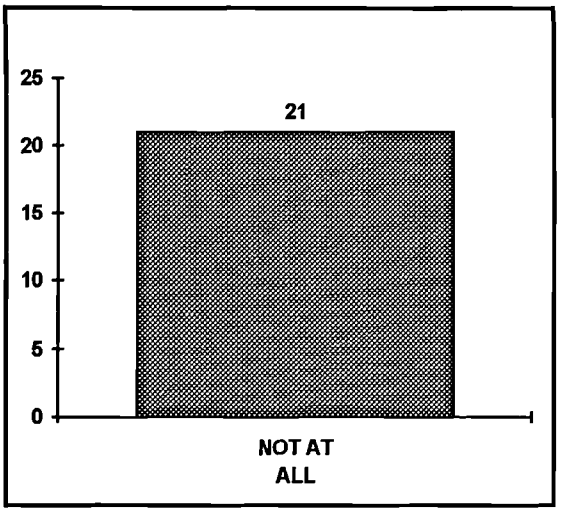

Figure B11.6: Writing Skills (S)

Writing skills were not in evidence.

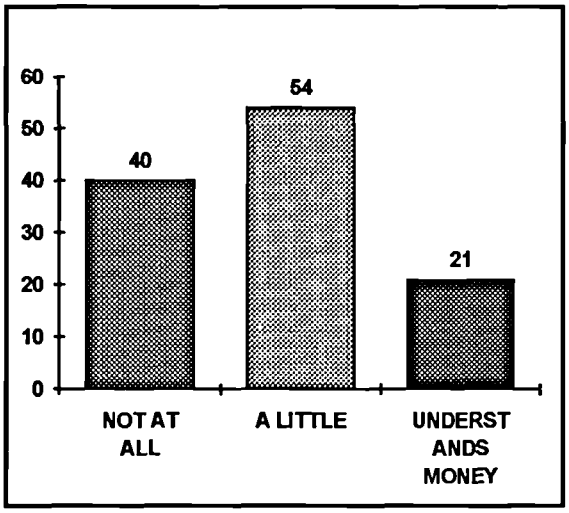

Figure B11.7: Numeracy Skills (R)

Only 35% were said to lack numeracy skills and only 18% of the remainder were able to demonstrate an understanding of money.

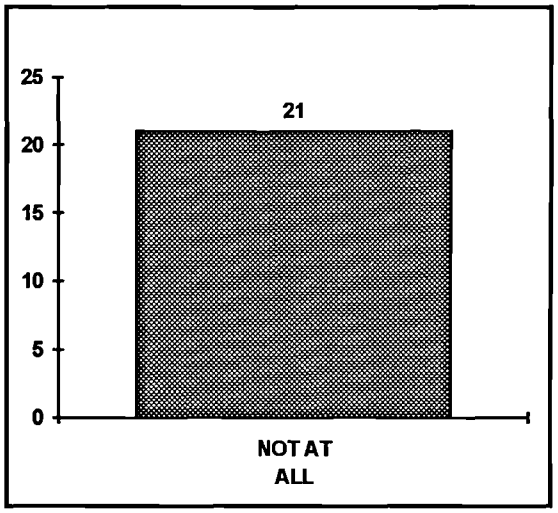

Figure B11.8: Numeracy Skills (S)

Numeracy skills were not in evidence.

KEY: Sample Population =(S) 21 participants; Remainder of Population = (R) 115 participants.

Summary of Multi-Axial Case History Information: Tables and Figures

II. COMMUNICATION BACKGROUND	REMAINDER n	%	SAMPLE n	%	TOTAL n	%
Use of spoken words						
(1) Yes	115	100	4	19	119	87.5
(2) Used to	0	0	7	33	7	5
(3) Never	0	0	10	48	10	12
(4) Not known	0	0	0	0	0	0
Use of Makaton signs						
(1) Yes	60	52	8	38	68	50
(2) Used to	1	1	4	19	5	3.5
(3) Never	54	47	9	43	63	46.5
(4) Not known	0	0	0	0	0	0
Speech therapy prior to entering adult services						
(1) Yes	24	21	13	61	37	27
(2) No	52	45	2	10	54	40
(3) Not known	39	34	6	29	45	33
Duration						
(1) Less than a year	2	8	4	31	6	12.5
(2) More than a year	7	28	3	23	20	41.5
(3) Intermittent	2	8	1	1	3	6
(4) Not known	14	56	5	45	19	40
Speech Therapy techniques						
(1) Makaton	11	38	2	14	13	30
(2) Symbols	2	7	0	0	2	5
(3) Direct speech	7	24	1	7	8	18.5
(4) Other	2	7	6	43	8	18.5
(5) Not known	7	24	5	36	12	28

Table B12.1 Summary Table of Communication Background from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

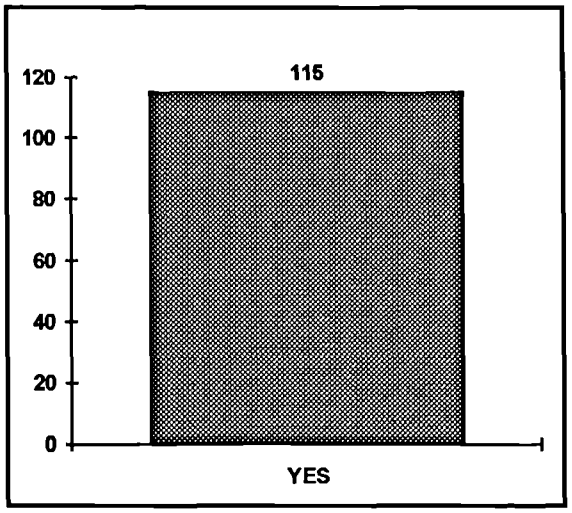

Figure B12.1: Use of at least One Spoken Word (R)

All of the remainder were able to use at least one spoken word.

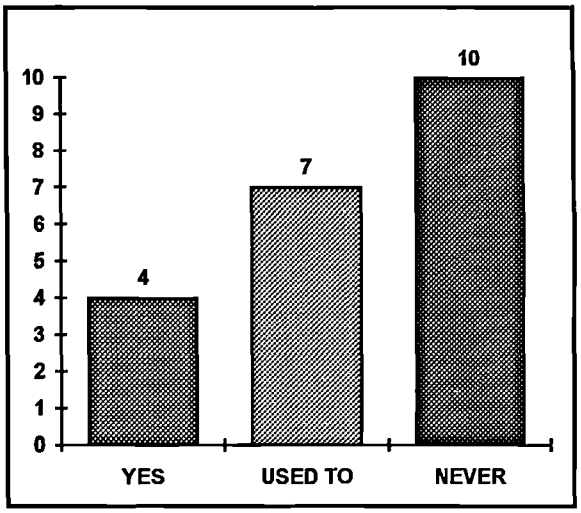

Figure B12.2: Use of at least One Spoken Word (S)

Four participants were reported as using at least one spoken word and seven used words in the past which were no longer evidently in use in the present.

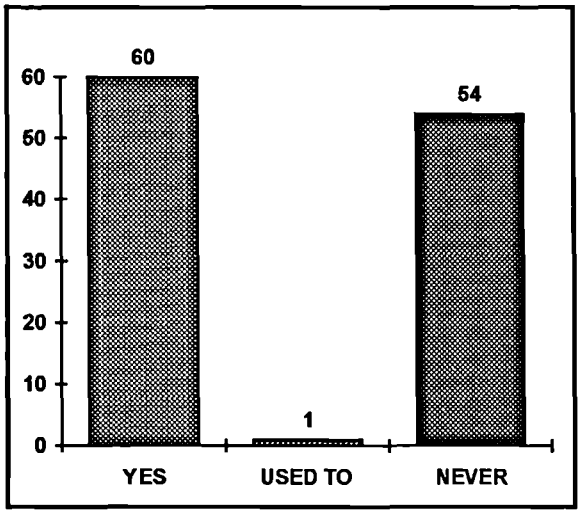

Figure B12.3: Use of at least One Makaton Sign (R)

A large proportion had use of Makaton signs (52%) which is probably a reflection of the Centre's curriculum at that time.

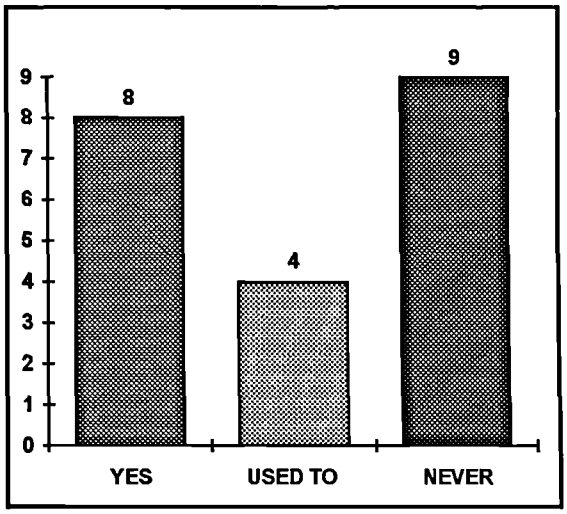

Figure B12.4: Use of at least One Makaton Sign (S)

The use of at least 1 Makaton sign was higher than spoken words.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

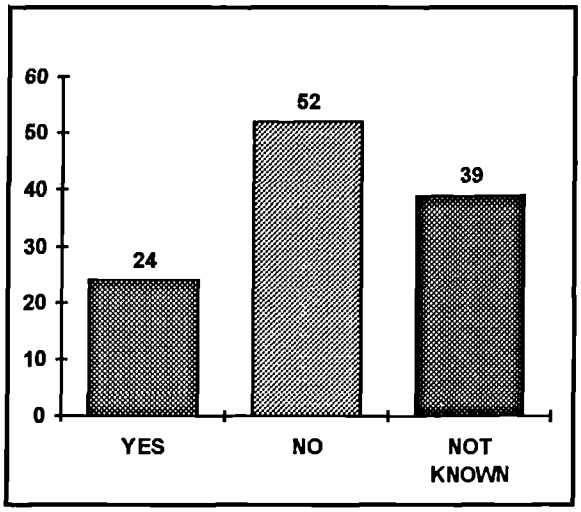

Figure B12.5: Episode of Speech Therapy Prior to Entry to Adults Services (R)

About a third of the remainder had received Speech and Language Therapy prior to entry to adult services.

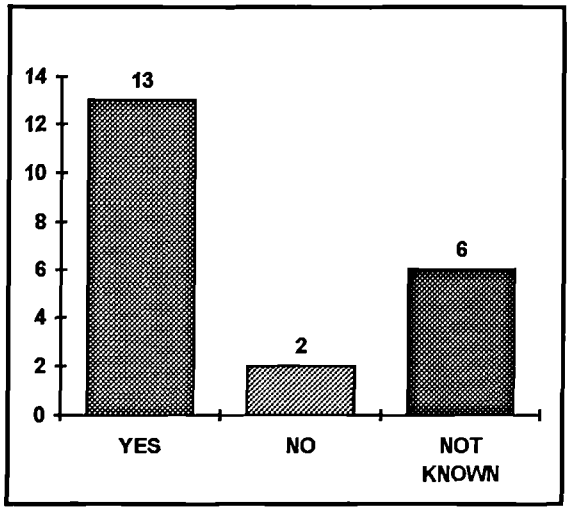

Figure B12.6: Episode of Speech Therapy Prior to Entry to Adults Services (S)

Proportionally more of the sample had received Speech and Language Therapy prior to entry to adult services.

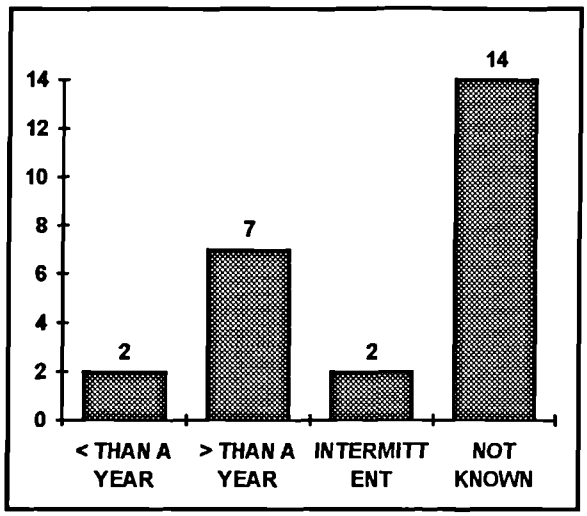

Figure B12.7: Duration of Episode of Speech Therapy (R)

Detail of duration of therapy episodes was fairly inconsistent.

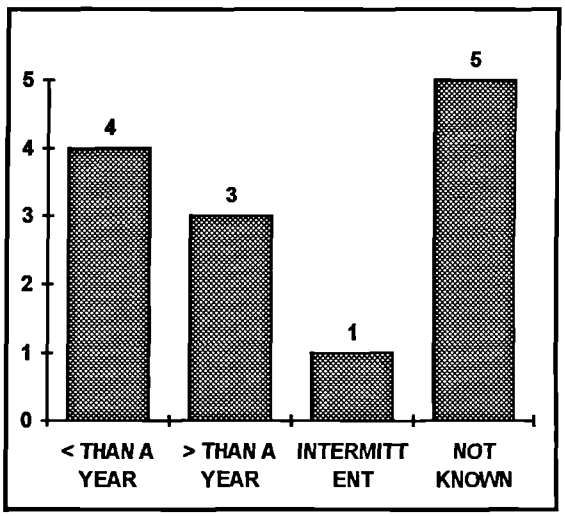

Figure B12.8: Duration of Episode of Speech Therapy (S)

There was a lack of available information for the sample.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

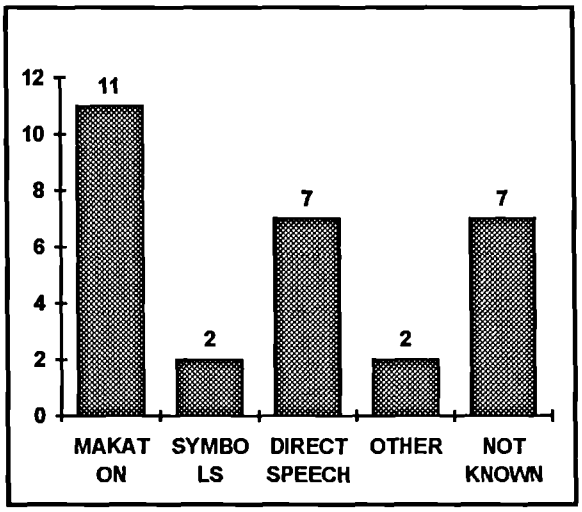

Figure B12.9: Techniques Used in Therapy (R)

Makaton signing was predominantly in use (38%).

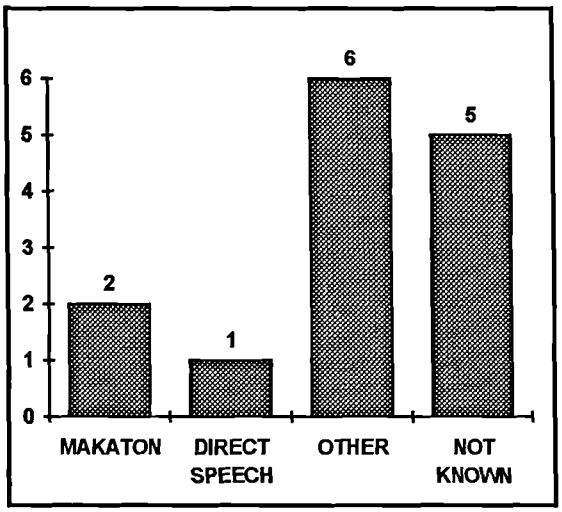

Figure B12.10: Techniques Used in Therapy (S)

Makaton was used with two participants although the rest experienced general language and multi-sensory stimulation work (43%).

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

Summary of Multi-Axial Case History Information: Tables and Figures

I. COMMUNITY LIVING SKILLS	REMAINDER		SAMPLE		TOTAL	
	n	%	n	%	n	%
Use of post office						
(1) Not at all	40	35	21	100	61	45
(2) With help	49	42	0	0	49	36
(3) Alone	25	22	0	0	25	18.5
(4) No opportunity	1	1	0	0	1	0.5
Use of telephone						
(1) Not at all	17	15	21	100	38	28
(2) With help	64	55	0	0	64	47
(3) Alone	34	30	0	0	34	25
(4) No opportunity	0	0	0	0	0	0
Use of public transport						
(1) Not at all	44	38	21	100	65	48
(2) With help	30	26	0	0	30	22
(3) Alone	38	33	0	0	38	28
(4) No opportunity	4	3	0	0	4	2

Table B13.1 Summary Table of Community Living Skills from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

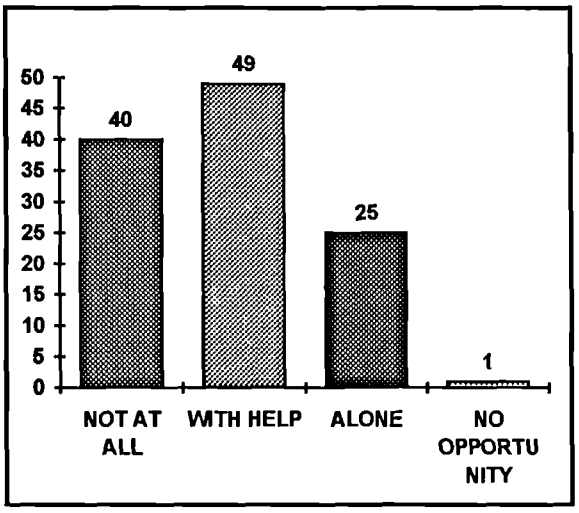

Figure B13.1: Use of a Post Office (R)

The majority could use a post office with help or else independently (64%).

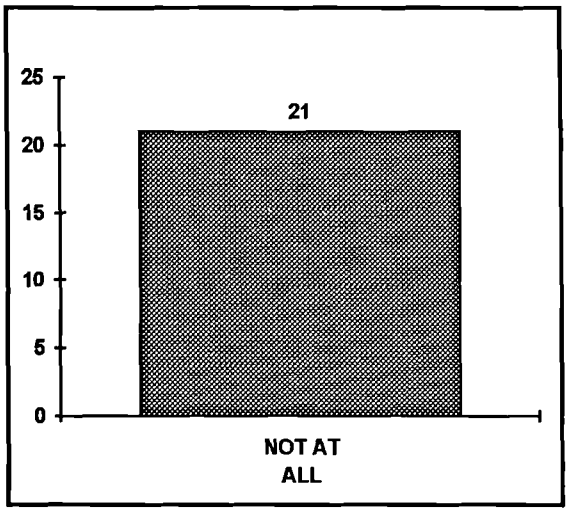

Figure B13.2: Use of a Post Office (S)

Functional use of a post office was not in evidence in the sample population.

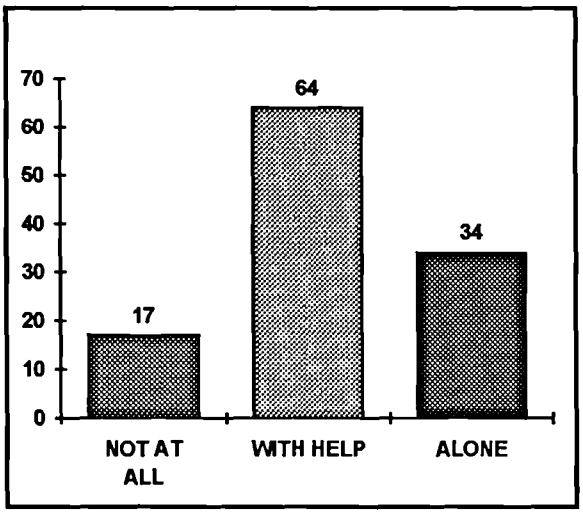

Figure B13.3: Use of a Telephone (R)

The majority could use a telephone with help or else independently (85%).

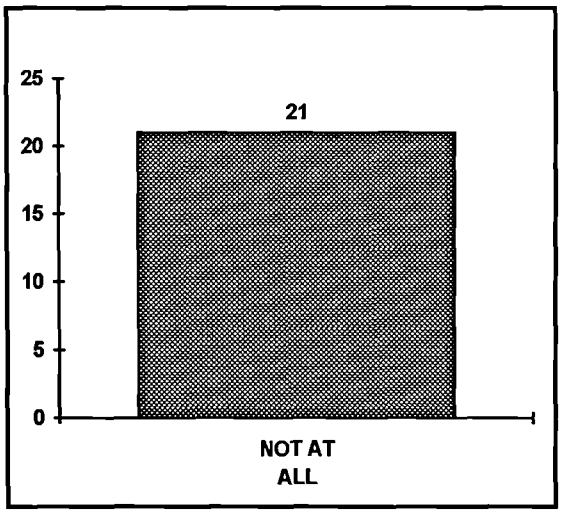

Figure B13.4: Use of a Telephone (S)

Functional use of a telephone was not in evidence in the sample population.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

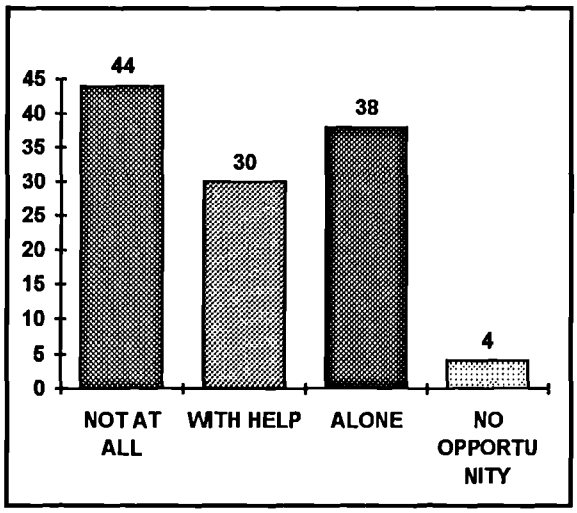

Figure B13.5: Use of Public Transport (R)

The majority could use public transport with help or else independently (59%).

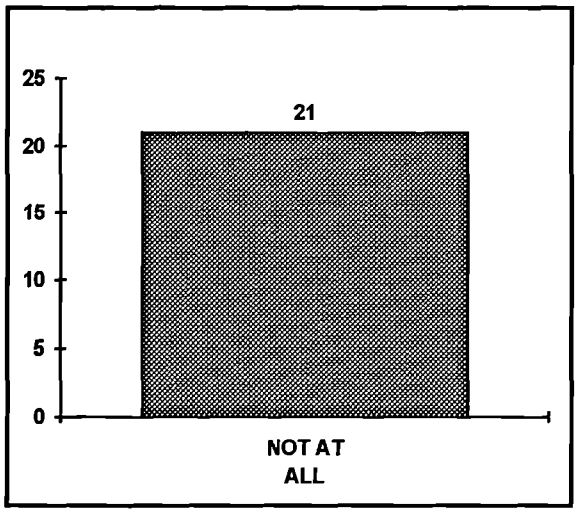

Figure B13.6: Use of Public Transport (S)

Functional use of public transport was not in evidence in the sample population.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

Summary of Multi-Axial Case History Information: Tables and Figures

J. BEHAVIOUR PROBLEMS	REMAINDER n	%	SAMPLE n	%	TOTAL n	%
a) Physical aggression to others						
Incidence						
None	92	80	11	52	103	75.5
< monthly	22	19	7	33	29	21.5
> monthly	1	1	3	15	4	3
Severity						
None	92	80	11	52	103	75.5
Minimal	13	11	8	38	21	15.5
Severe	10	9	2	10	12	9
b) Destructive to environment						
Incidence						
None	106	92	15	71	121	89
< monthly	7	6	2	10	9	6.5
> monthly	2	2	4	19	6	4.5
Severity						
None	106	92	15	71	121	89
Minimal	5	4	2	10	7	5
Severe	4	4	4	19	8	6
c) Overactive						
Incidence						
None	107	94	13	61	120	88
< monthly	4	3	2	10	6	4.5
> monthly	4	3	6	29	10	7.5
Severity						
None	107	94	13	61	120	88
Minimal	6	5	3	14	9	6.5
Severe	2	1	5	25	7	5.5
d) Self injurious behaviour (S.I.B.)						
Incidence						
None	99	86	9	43	108	79.5
< monthly	10	9	9	43	19	14
> monthly	6	5	3	14	9	6.5
Severity						
None	99	86	9	43	108	79.5
Minimal	14	12	10	48	24	17.5
Severe	2	2	2	9	4	3

Table B14.1 Summary Table of Problem Behaviour (a) to (d) from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

J. BEHAVIOUR PROBLEMS	REMAINDER		SAMPLE		TOTAL	
	n	%	n	%	n	%
e) Disturbing noises						
Incidence						
None	110	96	13	62	123	90.5
< monthly	0	0	2	10	2	1.5
> monthly	5	4	6	28	11	8
Severity						
None	110	96	13	62	123	90.5
Minimal	3	3	4	19	7	5
Severe	2	1	4	19	6	4.5
f) Temper tantrums						
Incidence						
None	106	92	14	66	120	88
< monthly	7	6	5	24	12	9
> monthly	2	2	2	10	4	3
Severity						
None	106	92	14	66	120	88
Minimal	8	7	4	19	12	9
Severe	1	1	3	15	4	3
g) Scatters/throws objects						
Incidence						
None	114	99	17	81	131	96.5
< monthly	0	0	1	5	1	0.5
> monthly	1	1	3	14	4	3
Severity						
None	114	99	17	81	131	96.5
Minimal	1	1	2	10	3	2
Severe	0	0	2	9	2	1.5
h) Stereotypic behaviour						
Incidence						
None	105	91	5	24	110	81
< monthly	2	2	0	0	2	1.5
> monthly	8	7	16	76	24	17.5
Severity						
None	105	91	5	24	110	81
Minimal	9	8	10	48	19	14
Severe	1	1	6	28	7	5

Table B14.2 Summary Table of Problem Behaviour (e) to (h) from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

J. BEHAVIOUR PROBLEMS	REMAINDER		SAMPLE		TOTAL	
	n	%	n	%	n	%
i) Inappropriate anal/oral behaviour						
Incidence						
None	114	99	16	76	130	95.5
< monthly	1	1	0	0	1	0.5
> monthly	0	0	5	24	5	4
Severity						
None	114	99	16	76	130	96
Minimal	1	1	2	10	3	2
Severe	0	0	3	24	3	2
j) Inappropriate masturbation (*in public*)						
Incidence						
None	110	95	16	76	126	92.5
< monthly	3	3	3	14	6	4.5
> monthly	2	2	2	10	4	3
Severity						
None	110	95	16	76	126	92.5
Minimal	5	5	3	14	8	6
Severe	0	0	2	10	2	1.5
k) Other *(as specified)*						
Incidence						
None	88	77	7	33	95	70
< monthly	14	12	0	0	14	10
> monthly	13	11	14	67	27	20
Severity						
None	88	77	7	33	95	70
Minimal	14	12	9	43	23	17
Severe	13	11	5	24	18	13

Table B14.3 Summary Table of Problem Behaviour (i) to (k) from Case History

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

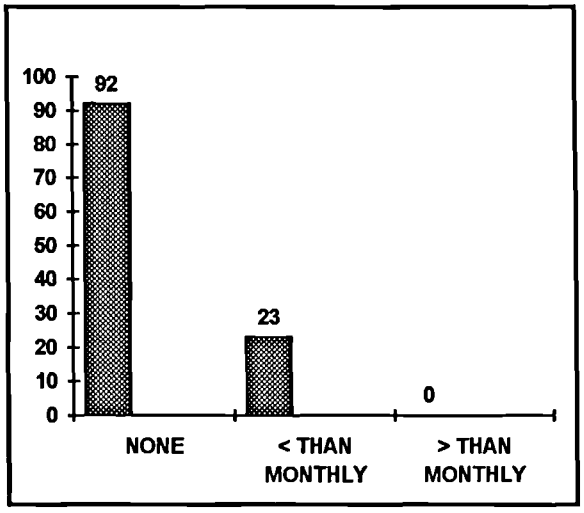

Figure B14.1: Incidence of Physical Aggression to Others (R)

Only 20% of the remainder engaged in some degree of physical aggression to others.

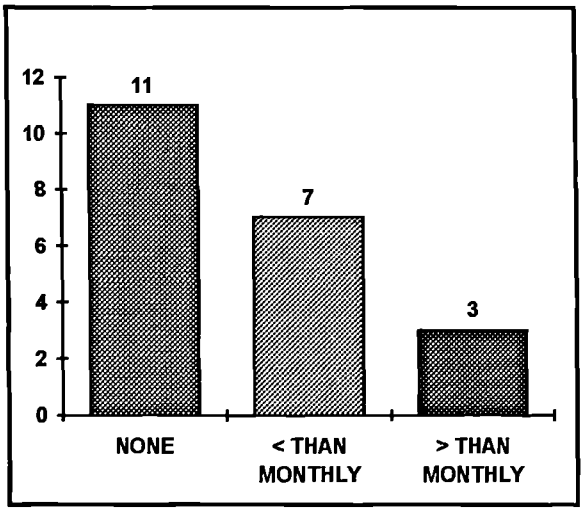

Figure B14.2: Incidence of Physical Aggression to Others (S)

More than double the proportion of the remainder, engaged in physical aggression to others in the sample population.

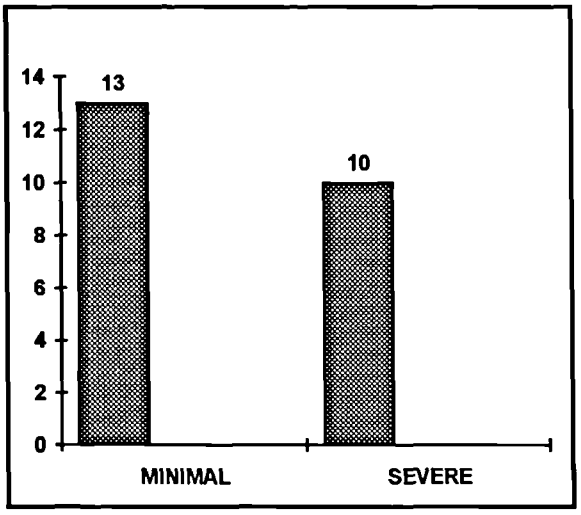

Figure B14.3: Severity of Physical Aggression to Others (R)

Severity of cases emitting aggression to others was greater in the remainder of the population.

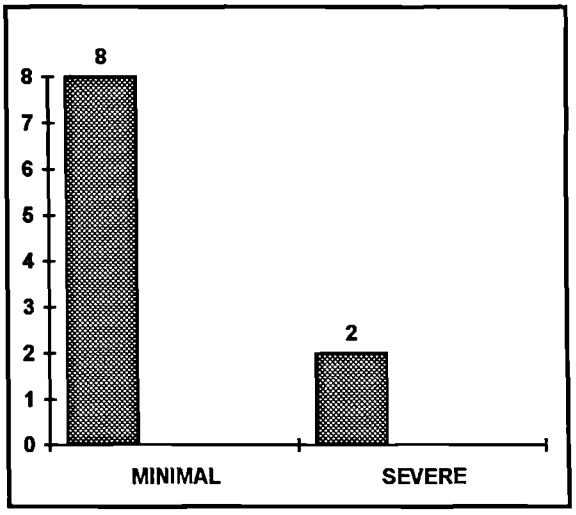

Figure B14.4: Severity of Physical Aggression to Others (S)

The majority of cases of physical aggression to others was rated as minimal.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

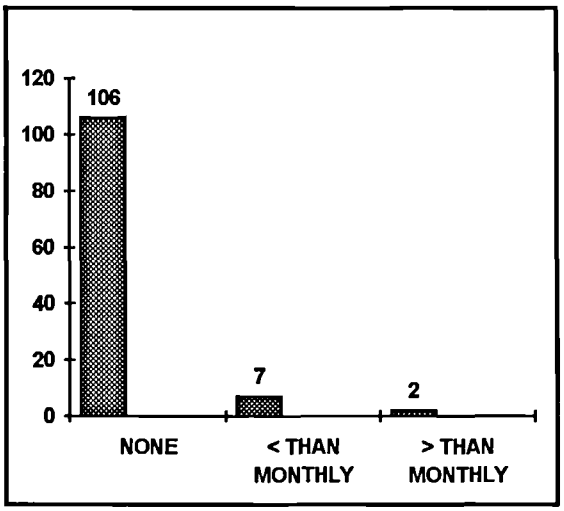

Figure B14.5: Incidence of Destruction to Environment (R)

Only 9 participants engaged in destruction to the environment.

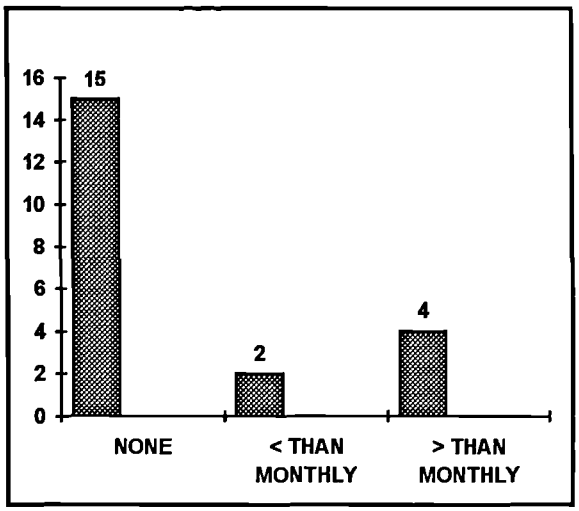

Figure B14.6: Incidence of Destruction to Environment (S)

Destruction to the environment was proportionally higher amongst the sample population (29%).

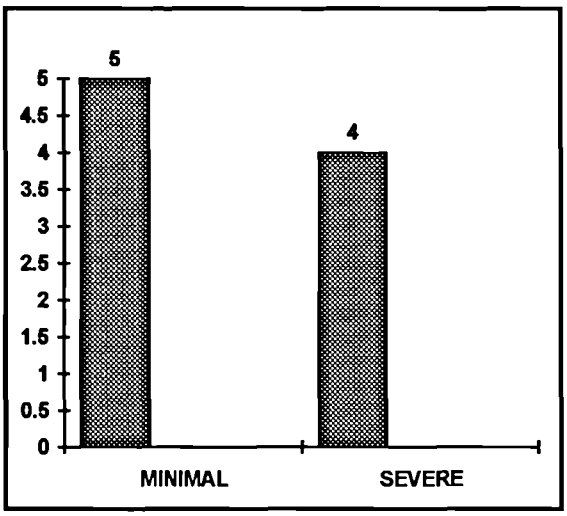

Figure B14.7: Severity of Destruction to Environment (R)

The severity of destruction to the environment was less than for the sample population.

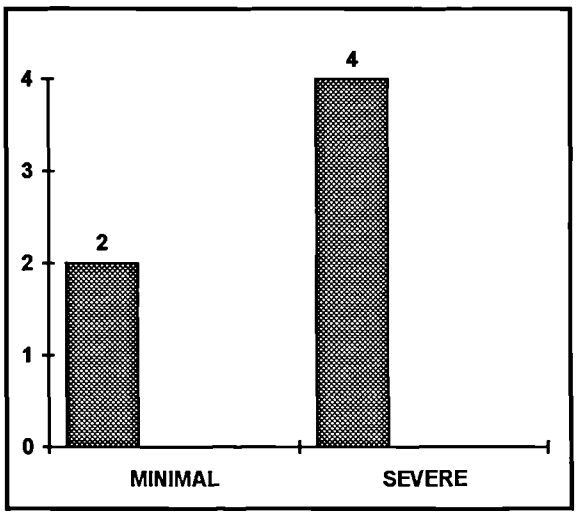

Figure B14.8: Severity of Destruction to Environment (S)

Four participants were said to engage in destruction to the environment considered to be severe.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

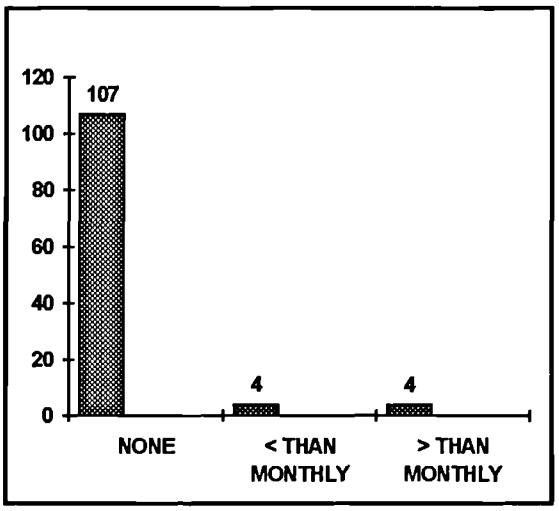

Figure B14.9: Incidence of Over Active Behaviour (R)

Only 8 participants were considered to be over active representing 6% of the remainder of the population.

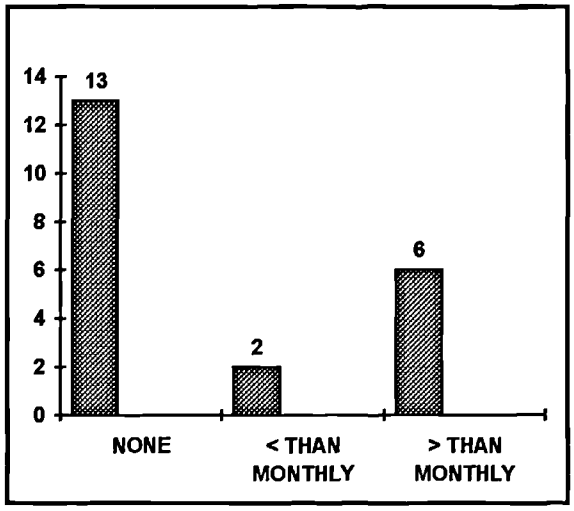

Figure B14.10: Incidence of Over Active Behaviour (S)

This was reported to be at a higher rate for the sample population (39%).

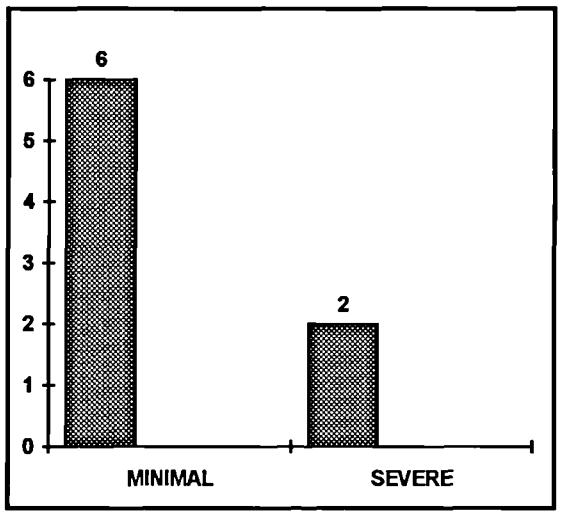

Figure B14.11: Severity of Over Active Behaviour (R)

Only two subject's over active behaviour was rated as severe.

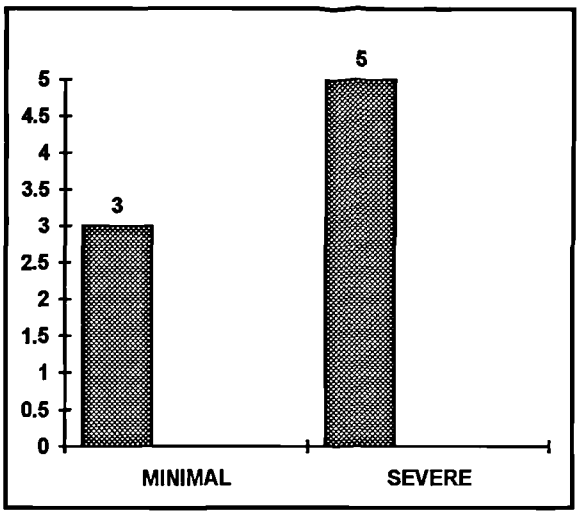

Figure B14.12: Severity of Over Active Behaviour (S)

The severity of over active behaviour was considered to be greater for the sample population.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

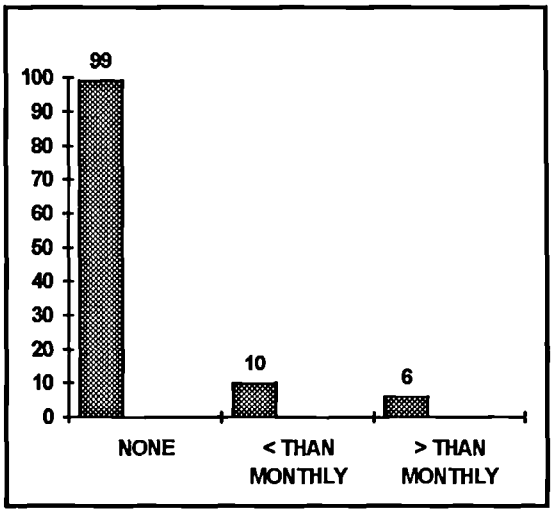

Figure B14.13: Incidence of Self-Injurious Behaviour (R)

Self-injurious behaviour was said to be emitted by 16 participants representing 14% of the remainder of the population.

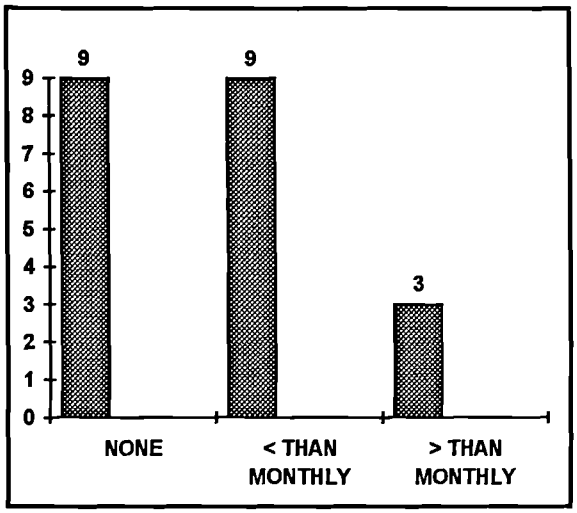

Figure B13.14: Incidence of Self-Injurious Behaviour (S)

A higher proportion of the sample was said to engage in self-injurious behaviour representing 29% of the participants .

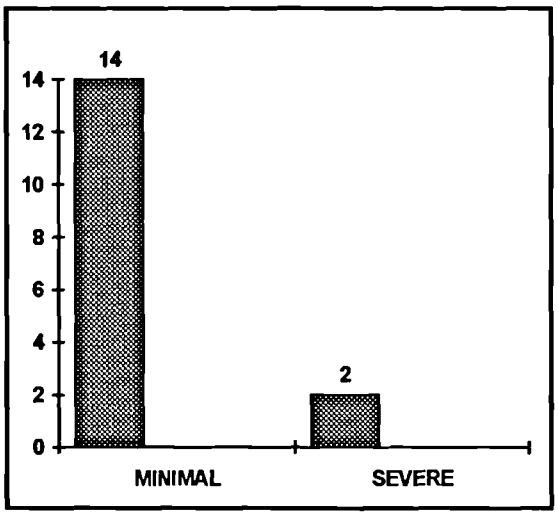

Figure B14.15: Severity of Self-Injurious Behaviour (R)

The majority of cases exhibiting S.I.B. were not severe.

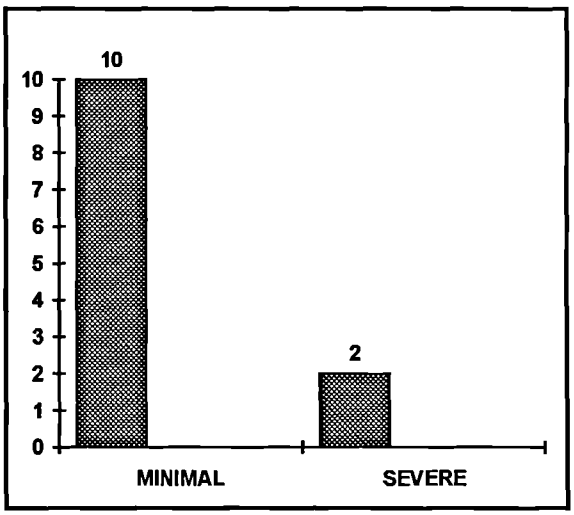

Figure B14.16: Severity of Self-Injurious Behaviour (S)

The majority of cases exhibiting S.I.B. were not severe.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

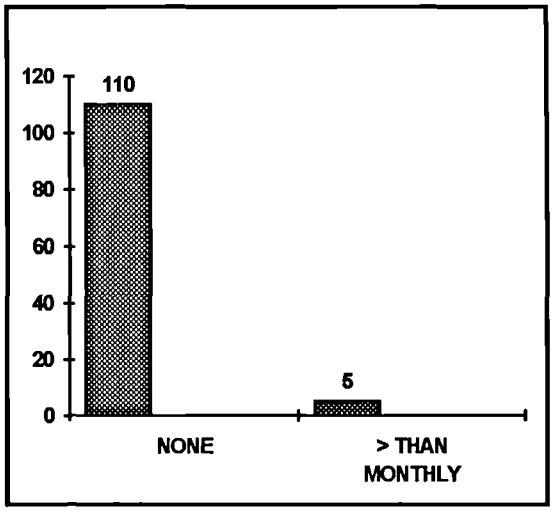

Figure B14.17: Incidence of Disturbing Noises (R)

Only five participants were said to emit disturbing noises.

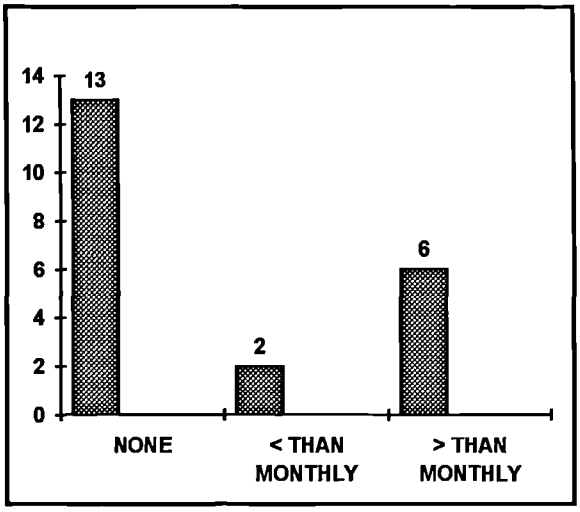

Figure B14.18: Incidence of Disturbing Noises (S)

Disturbing noises were emitted at a proportionally higher rate for the sample population.

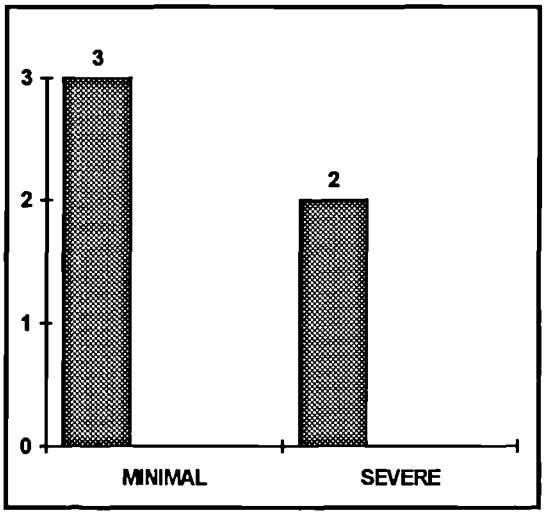

Figure B14.19: Severity of Disturbing Noises (R)

There was little difference between the minimal and severe ratings for participants emitting disturbing noises.

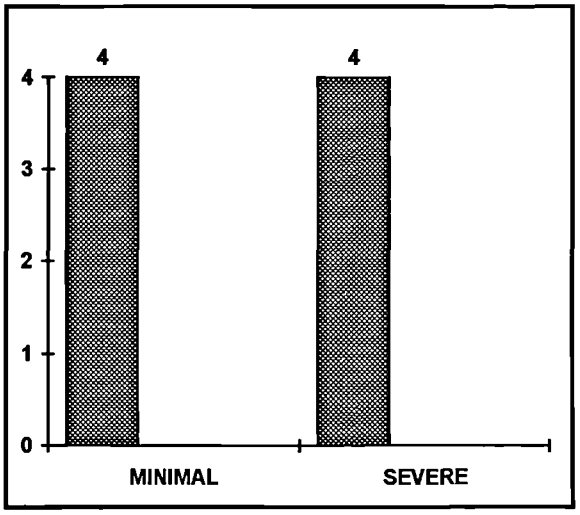

Figure B14.20: Severity of Disturbing Noises (S)

Cases of disturbing noises were rated equally between minimal and severe.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

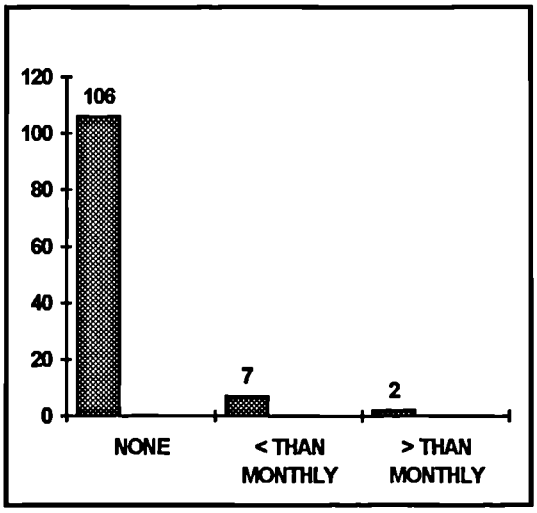

Figure B14.21: Incidence of Temper Tantrums (R)

Only 9 participants were said to engage in temper tantrums representing 8% of the remainder of the population.

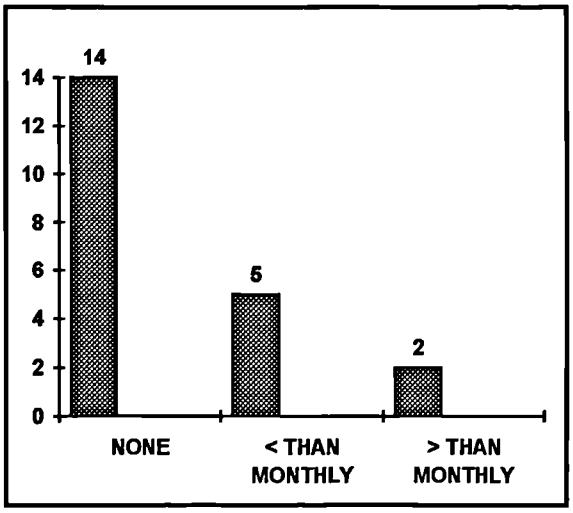

Figure B14.22: Incidence of Temper Tantrums (S)

A higher number of cases of temper tantrums was reported for the sample population (34%).

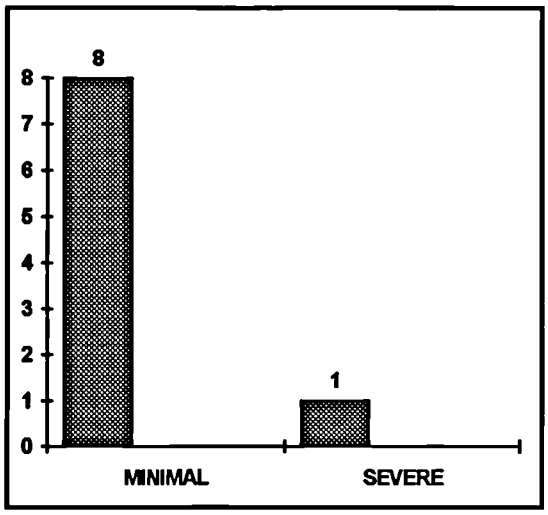

Figure B14.23: Severity of Temper Tantrums (R)

Tantrums were rated as largely minimal for the remainder of the population.

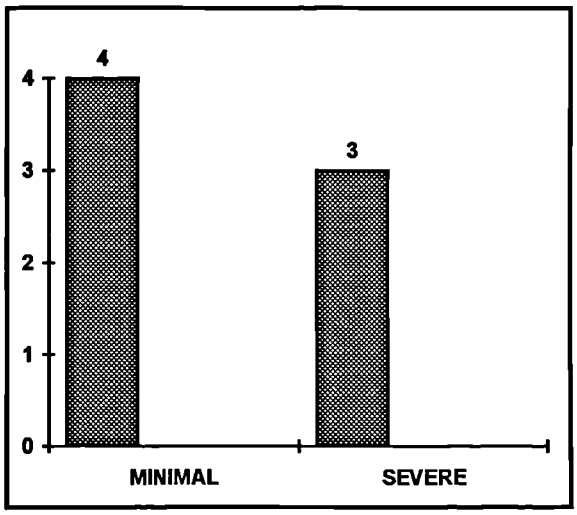

Figure B14.24: Severity of Temper Tantrums (S)

Three of the cases in the sample population were considered to exhibit severe temper tantrums.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

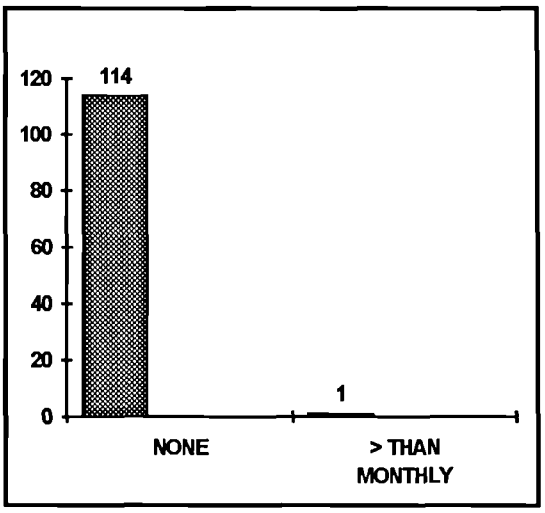

Figure B14.25: Incidence of Throwing Objects (R)

Only one participant engaged in throwing objects.

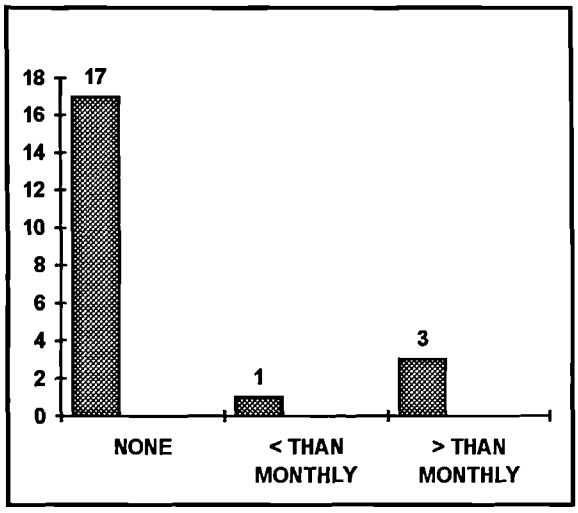

Figure B14.26: Incidence of Throwing Objects (S)

Four participants engaged in throwing objects representing 19% of the sample population.

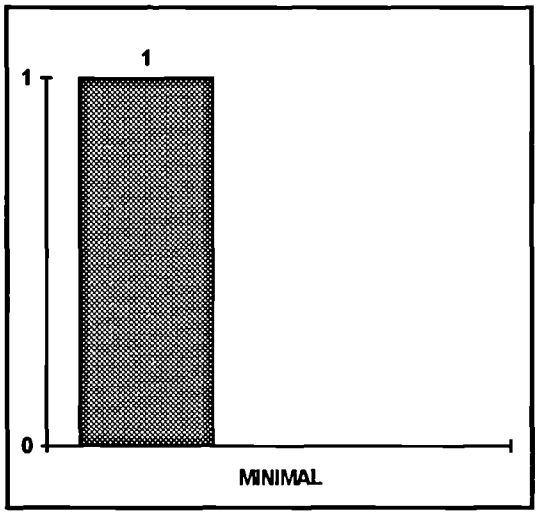

Figure B14.27: Severity of Throwing Objects (R)

The one case of throwing objects was judged to be minimal.

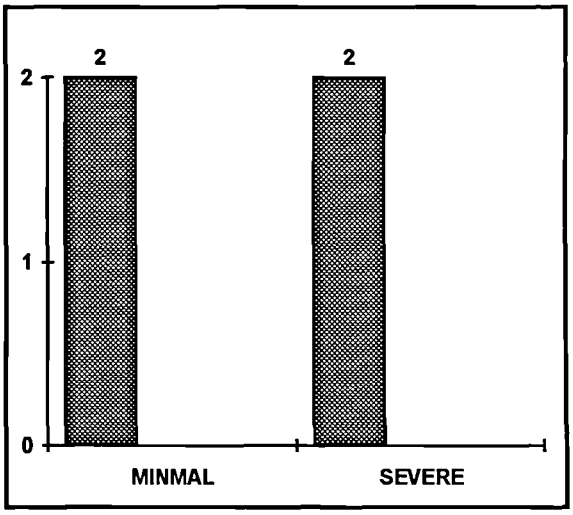

Figure B14.28: Severity of Throwing Objects (S)

The severity rating was equally divided between minimal and severe for the 4 cases in the sample population.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

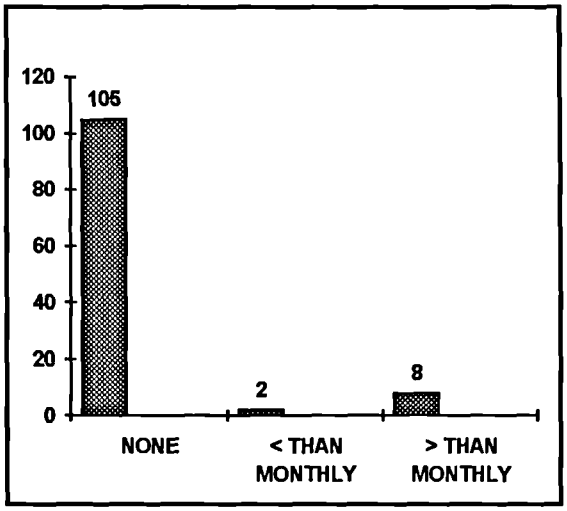

Figure B14.29: Incidence of Stereotypic Behaviour (R)

Only ten participants were considered to engage in stereotypic behaviours.

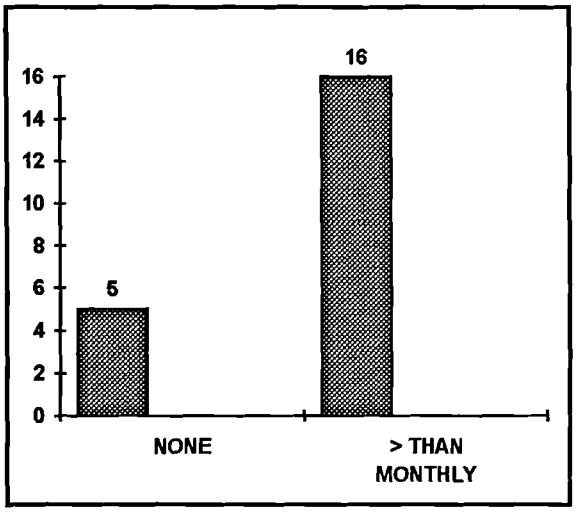

Figure B14.30: Incidence of Stereotypic Behaviour (S)

A significantly higher proportion of the sample displayed stereotypic behaviours representing 76% of this sub-population.

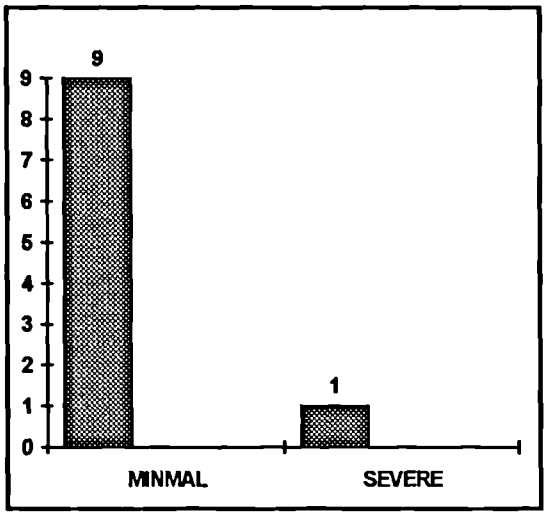

Figure B14.31: Severity of Stereotypic Behaviour (R)

Only one case of stereotypic behaviour was considered to be severe.

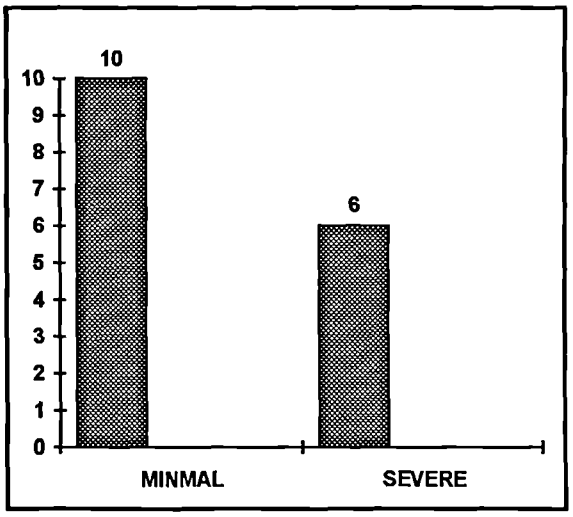

Figure B14.32: Severity of Stereotypic Behaviour (S)

Six of the cases of stereotypic behaviour were considered to be severe.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

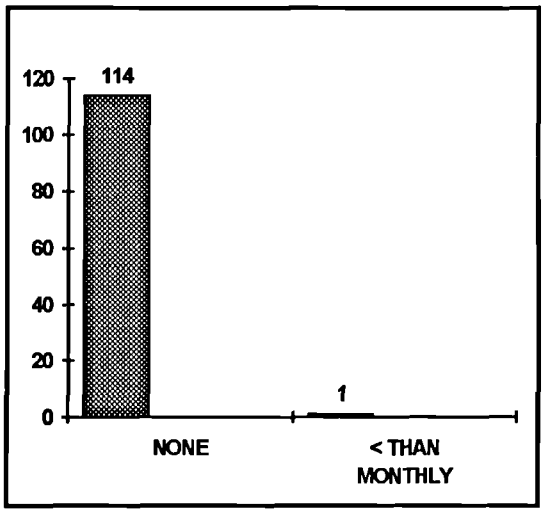

Figure B14.33: Incidence of Inappropriate Anal/Oral Behaviour (R)

Only one case in the remainder was said to exhibit inappropriate anal/oral behaviour.

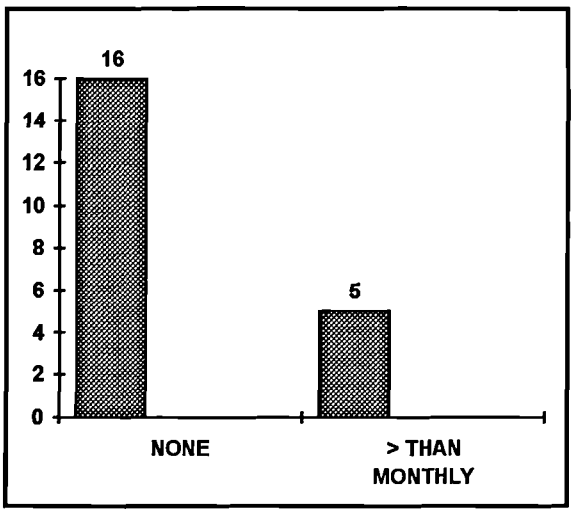

Figure B14.34: Incidence of Inappropriate Anal/Oral Behaviour (S)

Five cases were reported to exhibit inappropriate anal/oral behaviour. In one case it was considered to be a characteristic behaviour associated with Rett's Syndrome (oral behaviour).

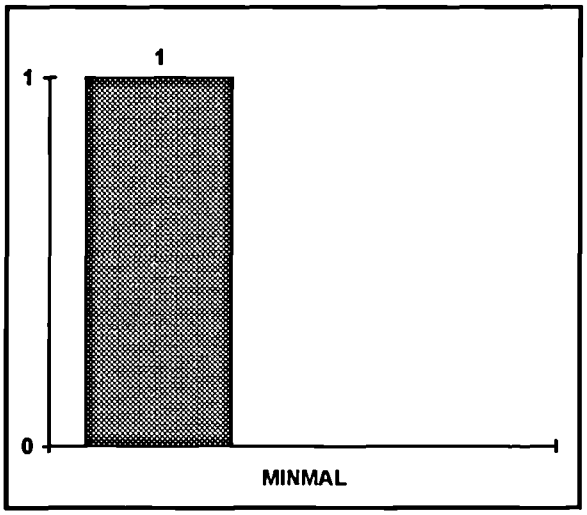

Figure B14.35: Severity of Inappropriate Anal/Oral Behaviour (R)

The one case reported was rated as minimal in severity.

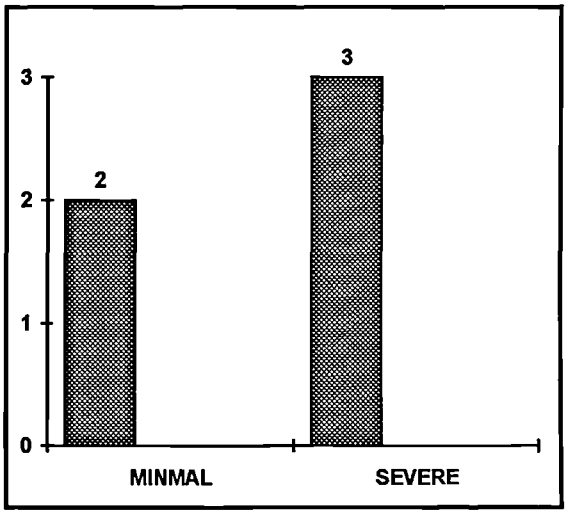

Figure B14.36: Severity of Inappropriate Anal/Oral Behaviour (S)

Three of the reported cases were considered to be severe.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

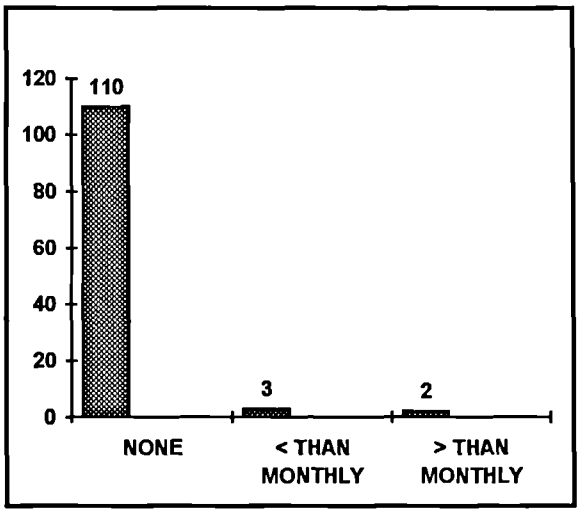

Figure B14.37: Incidence of Inappropriate Masturbation (R)

Only 5 participants were said to engage in masturbation in inappropriate places.

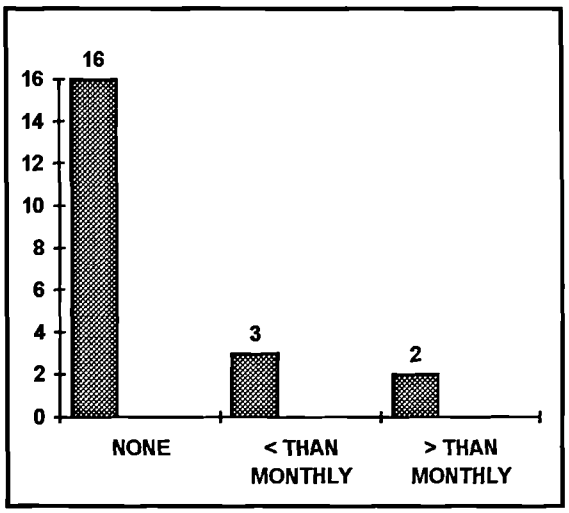

Figure B14.38: Incidence of Inappropriate Masturbation (S)

Five participants representing 24% of the sample population were said to engage in inappropriate masturbation.

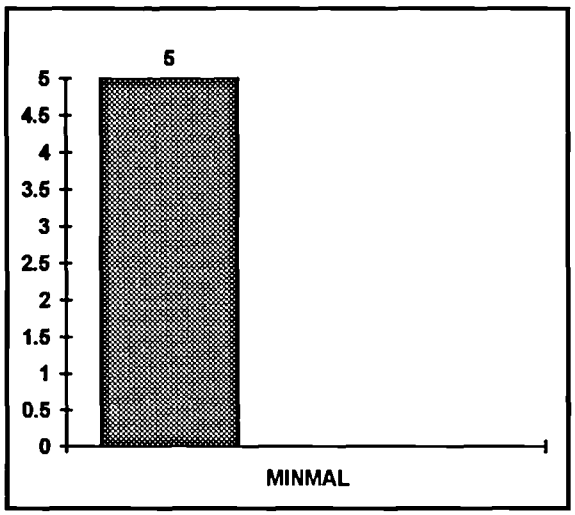

Figure B14.39: Severity of Inappropriate Masturbation (R)

The severity rating for all 5 cases was minimal.

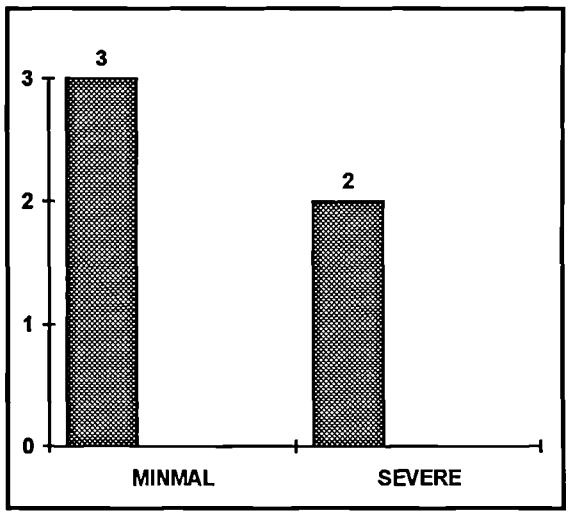

Figure B14.40: Severity of Inappropriate Masturbation (S)

Generally the behaviour when it occurred in cases in the sample population was considered to be more severe than those in the remainder.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

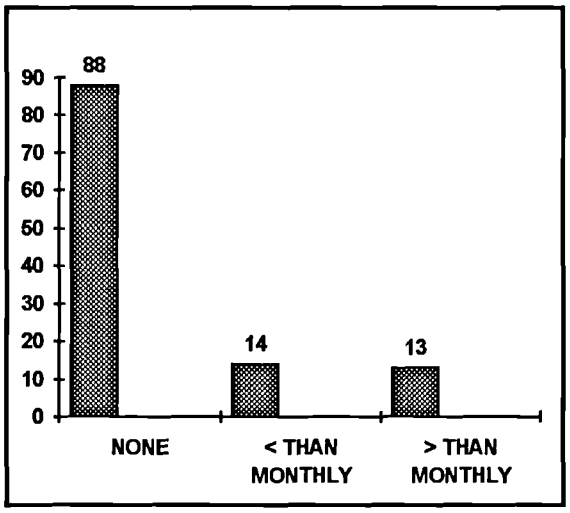

Figure B14.41: Incidence of Other Problem Behaviours (R)

Twenty-seven participants were said to engage in other problem behaviours, the most frequently reported to be inappropriate verbal behaviour.

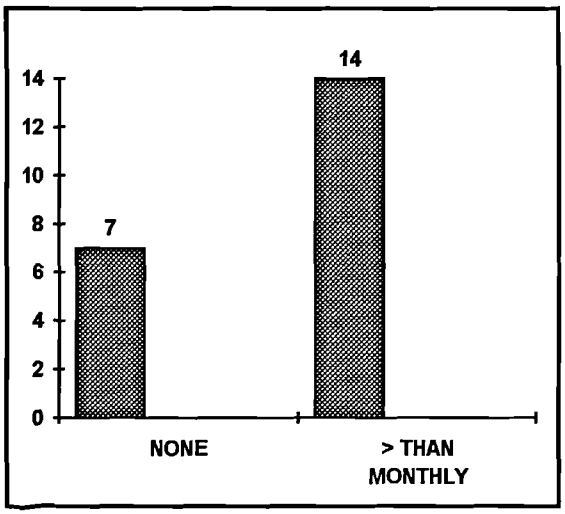

Figure B14.42: Incidence of Other Problem Behaviours (S)

A higher proportion of the sample (n = 14; 67%) were said to engage in other problem behaviours, the most frequently reported to be manipulating/tearing clothes (n = 4) and ritualistic hand-arm movements (n = 3).

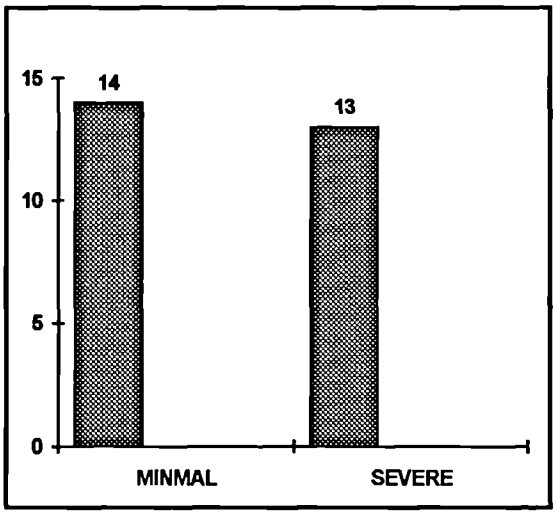

Figure B14.43: Severity of Other Problem Behaviours (R)

Severity ratings for other problem behaviours was roughly divided between minimal and severe.

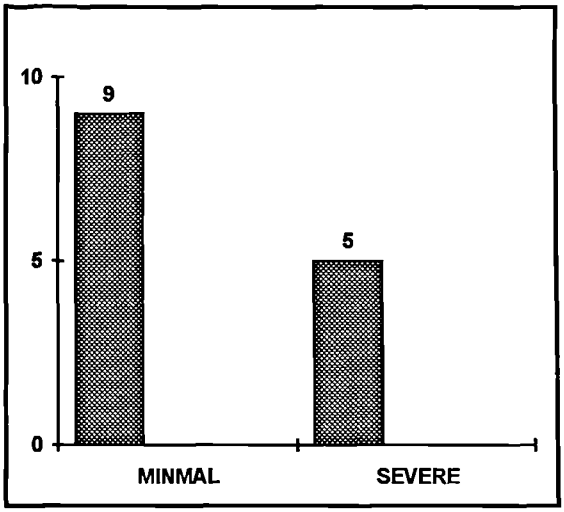

Figure B14.44: Severity of Other Problem Behaviours (S)

The majority of other problem behaviours were considered to be minimal.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

Summary Multi-Axial Case History Information: Tables and Figures

K. PERCEIVED SUPPORT REQUIRED	REMAINDER n	%	SAMPLE n	%	TOTAL n	%
Staff support required by client						
(1) Full-time	38	33	21	100	59	43.5
(2) Part of the day	51	44	0	0	51	37.5
(3) Minimal	26	23	0	0	26	19
(4) None	0	0	0	0	0	0

Table B15.1 Summary Table of Perceived Support Required from Case History

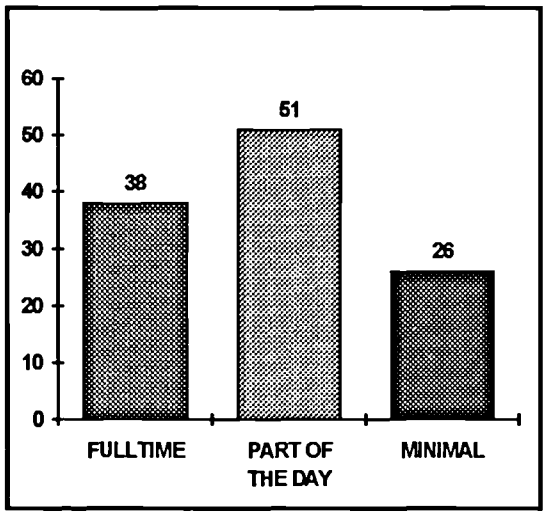

Figure B15.1: Perceived Support Needs (R)

Only 38% of the remainder of the population were considered to have full-time support needs, the rest requiring minimal or support for part of the day.

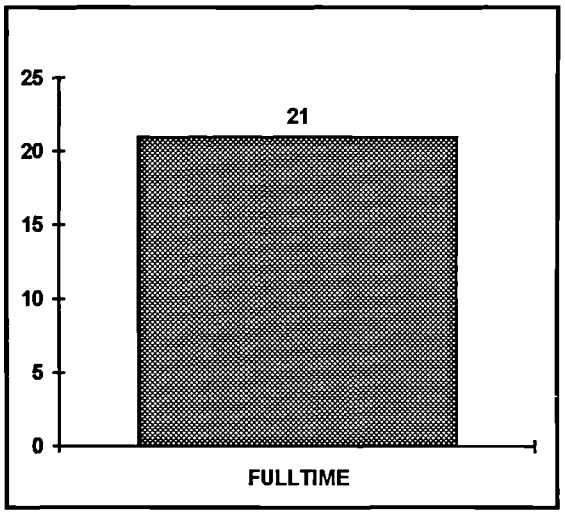

Figure B15.2: Perceived Support Needs (S)

All participants in the sample population were considered to have full-time support needs.

KEY: Sample Population = (S) 21 participants; Remainder of Population = (R) 115 participants.

1. DESCRIPTION OF I.S.E. EQUIPMENT

ITEM	DESCRIPTION	FEEDBACK FEATURES
1. Fan	Silk-screen fan with wooden hand hold - manipulated by vertical or horizontal wrist/hand movements.	**(i) Tactile sensation:** wafts of cool air on skin at various rates and intervals, of differing forces. **(ii) Visual content:** white silk-screen with small picture design, moved in short, regular strokes - up and down - in participant's visual field.
2. Brush materials	Soft bristled make up brush; * chamois leather; * fur; * flannel mitt.	**(i) Tactile sensation:** soft, repetitive strokes in circular motions - brushing of skin. * slightly abrasive. **(ii) Sound production:** quiet, stroking sound in contact with skin.
3. Facial massager (PIFCO)	Hand held battery massager with soft, brush head, which rotates when 'on' switch is depressed.	**(i) Tactile sensation:** soft, circular, brushing of skin. **(ii) Sound production:** emits motor generated sound when 'on' switch is depressed.
4. Talcum powder	Ordinary, cosmetic, non-perfumed talcum powder.	**(i) Tactile sensation:** light, dry touch - gradually massaged into hands. **(ii) Sustained movement:** floats on air and can disappear.

Figure C1.1: Table Showing Dimensional Analysis of I.S.E. Equipment

(Use: Therapist to participant for person contact and Participant to Therapist for event knowledge).

ITEM	DESCRIPTION	FEEDBACK FEATURES
5. Creams - lotion - cream - foam	Unperfumed, ordinary cosmetic products: cold cream; body lotion; shaving foam; baby lotion mouse.	**(i) Tactile sensation:** wet, smooth of varying consistency:- liquid to viscous; heavy to light; sticky to non-adhesive. **(ii) Sustained movement:** alters form according to manipulations.
6. Moisture tissues	(Perfumed only available), moisture tissues used commonly as cosmetic wipes.	**(i) Tactile sensation:** moist, cold tissues - varying sensation according to pressure exerted - becomes dryer with extended use.
7. Body massager (CARMEN)	Hand held, electrical body massager with a choice of 4 inter-changeable heads. Emits vibrations with dual speed control.	**(i) Vibro-tactile sensation:** emits vibrations at 2 different rates when placed in contact with skin. **(ii) Sound production:** emits motor-generated sound.
8. Executive swivel chair	Swivel chair with high back and arms, that rotates by manual application.	**(i) Vestibular sensation:** angular stimulation of semi-circular canals - rotation, of varying rate and direction. **(ii) Visual content:** contents, colours lights of room, move round the person's visual field.
9. Rocking chair	Ordinary rocking chair with cushioned seat, high back and arms, that rocks by manual application.	**(i) Vestibular sensation:** linear stimulation of semi-circular canals - rocking, in a smooth, regular pattern. **(ii) Visual content:** changing perspective of visual field, as moving to and fro.

Table C1.1: Table Showing Dimensional Analysis of I.S.E. Equipment (continued)

ITEM	DESCRIPTION	FEEDBACK FEATURES
1. Water ball	Strong, rubberised balloon, filled with cold water.	**(i) Sustained movement:** inconstant form that adapts according to manipulations. **(ii) Tactile sensation:** cold, smooth feedback. **(iii) Sound production:** makes glugging sound when being manipulated or in contact with other surface. **(iv) Visual content:** dull, red colour of approximately coconut size.
2. Paint sandwich	1 square of cling film, squirts of 2 different colour poster paints in the centre, and a second square of cling film covering it, and sealed at the edges.	**(i) Tactile sensation:** smooth, soft, dry and squidgy feeling. **(ii) Visual content:** dual colour which changes according to manipulations, and leaves no visible mark on participant.
3. Cornflour paste	Cornflour mixed with water and food colouring to paste.	**(i) Tactile sensation:** dry to the touch, but smooth and wet, but sticky to manipulate. **(ii) Sustained movement:** inconstant form - flows or drips according to manipulations, or appears solid. **(iii) Visual content:** brightly coloured substance - shiny liquid in appearance.

Figure C1.2: Table Showing Dimensional Analysis of I.S.E. Equipment

Use: Participant directs object contact to Therapist for event knowledge

ITEM	DESCRIPTION	FEEDBACK FEATURES
4. Finger paints	Viscous, primary coloured paints applied to paper with fingers.	**(i) Tactile sensation:** wet, sticky substance that adheres to paper and hands. **(ii) Sustained movement:** responsive to manipulations - if dropped on page or squeezed through fingers. **(iii) Visual content:** primary colours of wettish, viscous appearance.
5. Foam	Viscous, cosmetic foam (either shaving foam or baby lotion mousse) - only perfumed variety available.	**(i) Tactile sensation:** wet, light, smooth of varying consistency according to manipulations: foam → lotion. **(ii) Sustained movement:** alters form according to manipulations.
6. Sensory tray	Coloured, plastic tray, filled with one of the below: a) liquid (water) b) powder (flour) c) fine granular d) coarse granular e) dough THEN - 1 beaker; 2 beakers; 3 containers + lid.	**(i) Tactile sensation:** a) wet, warm fluid; b) dry, light touch; c) dry, fine grains; d) dry, coarse beans; e) moist, solid, pliable. **(ii) Sound production:** a) pouring/splashing; b) light patter; c) light clatter; d) heavy clatter; e) thudding sound. **(iii) Sustained movement:** rate, direction, flow or form is controlled by manipulations. **(iv) Visual content:** mainly neutral colours apart from the trays and beakers.

Table C1.2: Table Showing Dimensional Analysis of I.S.E. Equipment (continued)

ITEM	DESCRIPTION	FEEDBACK FEATURES
7. Vibro-bubble	Dome-shaped plastic bubble with metal sensors on the surface which when touched cause the bubble to vibrate. Different rates of vibration from different sensors.	**(i) Tactile sensation:** emits varying rates of vibrations when surface sensors are touched. **(ii) Sound production:** emits motor-generated sound when touched.
8. Vibro-cushion	Buff coloured, soft cushion in a corded cover.	**(i) Tactile sensation:** emits vibrations when surface is depressed. **(ii) Sound production:** emits low motor generated sound when activated.
9. Vibro-tube	Turquoise coloured 'bendy' massage tube which vibrates when end switch is activated.	**(i) Tactile sensation:** emits two rates of vibration according to position of end switch. **(ii) Sound production:** emits a low motor generated hum when activated.

Figure C1.2: Table to Show Dimensional Analysis of I.S.E. Equipment (continued)

2. DESCRIPTION OF DISTINCTIVE FEATURES OF I.S.E. EQUIPMENT

STIMULUS ITEM	CONTACT PROPERTIES	SOUND PRODUCTION (MOTOR GENERATED OR NOT)	TACTILE CONSIST-ENCY (DRY OR WET)	VESTIBULAR SENSATION (LINEAR OR ANGULAR)
AIR (fan)	INDIRECT NON TOUCH CONTACT	NOT	DRY	
SOFT BRUSH/ MATERIALS	INDIRECT TOUCH CONTACT	NOT	DRY	
MASSAGER BRUSH	INDIRECT TOUCH CONTACT	MOTOR GENERATED	DRY	
TALC	DIRECT TOUCH CONTACT	NOT	DRY	
CREAM/ LOTION/ FOAM	DIRECT TOUCH CONTACT	NOT	WET	
MOISTURE WIPES *	DIRECT TOUCH CONTACT	NOT	WET-DRY	
ELECTRIC BODY MASSAGER	INDIRECT VIBRO-TOUCH CONTACT	MOTOR GENERATED	DRY	
EXECUTIVE SWIVEL CHAIR	VESTIBULAR-ANGULAR	NOT		ROTATION
ROCKING CHAIR/ SLEIGH	VESTIBULAR-LINEAR	NOT		ROCKING

Figure C2.1: Table to Show Dimensional Analysis of Distinctive Feedback Features for Person Contact Stimuli in I.S.E. Schedule

STIMULUS ITEM	CONTACT PROPERTIES (vibro-tactile or NOT)	TACTILE CONSISTENCY (dry or wet)	SOUND PRODUCTION (motor generated or NOT)
WATER BALL PAINT SANDWICH	NOT	DRY	NOT
FOAM FINGER PAINTS CORNFLOUR PASTE	NOT	WET	NOT
VIBRO BUBBLE VIBRO CUSHION VIBRO TUBE	VIBRO-TACTILE	DRY	MOTOR GENERATED
SENSORY TRAY (*Powder, fine and coarse granular)*)	NOT	DRY	NOT
DOUGH	NOT	DRY-WET	NOT
LIQUID	NOT	WET	NOT

Figure C2.2: Table to Show Dimensional Analysis of Feedback Features of Object Contact Stimuli in I.S.E. Schedule

3. SUMMARY OF I.S.E. EQUIPMENT USED IN DECISION-MAKING SCHEDULE

1. PERSON ENGAGEMENT: I.S.E. SCHEDULE	
(a) Indirect Non Touch Contact	• fan
(b) Indirect Touch Contact	• brush massager • soft brush
(c) Direct Touch Contact	• talc • cream • moisture wipes (*practical use in cleaning participant's hands before proceeding to next item)
(d) Indirect Vibro-touch Contact	• electric body massager
(e) Vestibular Sensation	• linear • angular

Figure C3.1: List of Person Stimuli for I.S.E. Decision-Making Schedule

(the asterixed item carries an additional explanation for its inclusion).

B. OBJECT ENGAGEMENT: I.S.E. SCHEDULE	
(a) Wet Touch Contact	• foam
(b) Dry Touch Contact	• water Ball
(c) Vibro-touch Contact	• vibro cushion
(d) Sensory tray • dry touch • wet touch	• granular • liquid (& 1, 2, 3 containers as defined under order of presentation)

Table C3.2: List of Object Stimuli for I.S.E. Decision-Making Schedule

4. I.S.E. DECISION-MAKING SCHEDULE

CLIENT'S NAME: **D.O.B.:**

ASSESSMENT ENVIRONMENT:

ASSESSED BY:

ASSESSMENT PERIOD:

COMMENTS:

1.0 PERSON ENGAGEMENT

(1.1) INDIRECT NON TOUCH CONTACT: Hand Held Fan

PRESENTATION CUES

- (a) Show item - *Name*
- (b) Demonstrate item - *Name*
- (c) Offer item - *Name*
- (d) Physical prompt - *Name*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

RECURRENCE CUES

- (a) *Name* and say *More*
- (b) *Name* - say *More & sign*
- (c) *Name* - say *More & offer*
- (d) *Name* - say *More & physical prompt*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(1.2.1) INDIRECT TOUCH CONTACT: Soft Brush *(- sound production)*

PRESENTATION CUES

- (a) Show item - *Name*
- (b) Demonstrate item - *Name*
- (c) Offer item - *Name*
- (d) Physical prompt - *Name*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

RECURRENCE CUES

- (a) *Name* and say *More*
- (b) *Name* - say *More & sign*
- (c) *Name* - say *More & offer*
- (d) *Name* - say *More & physical prompt*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(1.2.2) INDIRECT TOUCH CONTACT: Massager brush *(+ sound production)*

PRESENTATION CUES

- (a) Show item - *Name*
- (b) Demonstrate item - *Name*
- (c) Offer item - *Name*
- (d) Physical prompt - *Name*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

RECURRENCE CUES

- (a) *Name* and say *More*
- (b) *Name* - say *More & sign*
- (c) *Name* - say *More & offer*
- (d) *Name* - say *More & physical prompt*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(1.3.1) DIRECT TOUCH CONTACT: Talcum Powder *(+ dry)*

PRESENTATION CUES

- (a) Show item - *Name*
- (b) Demonstrate item - *Name*
- (c) Offer item - *Name*
- (d) Physical prompt - *Name*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

RECURRENCE CUES

- (a) *Name* and say *More*
- (b) *Name* - say *More & sign*
- (c) *Name* - say *More & offer*
- (d) *Name* - say *More & physical prompt*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(1.3.2) DIRECT TOUCH CONTACT: Lotion/cream *(- dry)*

PRESENTATION CUES

- (a) Show item - *Name*
- (b) Demonstrate item - *Name*
- (c) Offer item - *Name*
- (d) Physical prompt - *Name*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

RECURRENCE CUES

- (a) *Name* and say *More*
- (b) *Name* - say *More & sign*
- (c) *Name* - say *More & offer*
- (d) *Name* - say *More & physical prompt*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(1.3.3) DIRECT TOUCH CONTACT: Moisturised Tissues *(-/+ dry)*

PRESENTATION CUES

- (a) Show item - *Name*
- (b) Demonstrate item - *Name*
- (c) Offer item - *Name*
- (d) Physical prompt - *Name*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

RECURRENCE CUES

- (a) *Name* and say *More*
- (b) *Name* - say *More & sign*
- (c) *Name* - say *More & offer*
- (d) *Name* - say *More & physical prompt*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(1.4) DIRECT VIBRO TOUCH CONTACT: Body Massager *(- dry; + sound)*

PRESENTATION CUES

- (a) Show item - *Name*
- (b) Demonstrate item - *Name*
- (c) Offer item - *Name*
- (d) Physical prompt - *Name*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

RECURRENCE CUES

- (a) *Name* and say *More*
- (b) *Name* - say *More & sign*
- (c) *Name* - say *More & offer*
- (d) *Name* - say *More & physical prompt*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(1.5.1) VESTIBULAR CONTACT: Rotation *(angular; + rate, + direction)*

PRESENTATION CUES

- (a) Seat client - *Name*
- (b) Demonstrate item - *Name*
- (c) Offer item - *Name*
- (d) Physical prompt - *Name*
- *APPLY STIMULUS "1-2-3 Go"*
- *WITHDRAW STIMULUS: "Stop"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

RECURRENCE CUES

- (a) *Name* and say *More*
- (b) *Name* - say *More & sign*
- (c) *Name* - say *More & offer*
- (d) *Name* - say *More & physical prompt*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Stop"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(1.5.2) VESTIBULAR CONTACT: Rocking *(linear: - rate; - direction)*

PRESENTATION CUES

- (a) Seat client - *Name*
- (b) Demonstrate item - *Name*
- (c) Offer item - *Name*
- (d) Physical prompt - *Name*
- *APPLY STIMULUS "1-2-3 Go"*
- *WITHDRAW STIMULUS: "Stop"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

RECURRENCE CUES

- (a) *Name* and say *More*
- (b) *Name* - say *More & sign*
- (c) *Name* - say *More & offer*
- (d) *Name* - say *More & physical prompt*
- *APPLY STIMULUS*
- *WITHDRAW STIMULUS: "Stop"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Appropriate word(s)	
1.2	Appropriate sign(s)	
1.3	Points	
1.4	Reaches	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

2.0 OBJECT ENGAGEMENT

(2.1.1) TACTILE CONTACT: Water Inflatable *(- wet)*

PRESENTATION CUES

- (a) Present item - *Name & Look*
- (b) Demonstrate item - *Name & Look*
- (c) Physical prompt - *Name & Look*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Touches	
1.2	Picks up	
1.3	Handles	
1.4	Shakes/waves	
1.5	Pats/bangs	
1.6	Pushes/pulls	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(2.1.2) TACTILE CONTACT: Foam *(+ wet)*

PRESENTATION CUES

- (a) Present item - *Name & Look*
- (b) Demonstrate item - *Name & Look*
- (c) Physical prompt - *Name & Look*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Touches	
1.2	Picks up	
1.3	Handles	
1.4	Shakes/waves	
1.5	Pats/bangs	
1.6	Pushes/pulls	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(2.2) VIBRO-TACTILE CONTACT: Vibro-bubble *(- wet; + sound)*

PRESENTATION CUES

- (a) Present item - *Name & Look*
- (b) Demonstrate item - *Name & Look*
- (c) Physical prompt - *Name & Look*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Touches	
1.2	Picks up	
1.3	Handles	
1.4	Shakes/waves	
1.5	Pats/bangs	
1.6	Pushes/pulls	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(2.3.1) TACTILE CONTACT: Sensory Tray: Granular *(- wet)*

PRESENTATION CUES

- (a) Present item - *Name & Look*
- (b) Demonstrate item - *Name & Look*
- (c) Physical prompt - *Name & Look*
- *WITHDRAW STIMULUS: "Gone"*

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Touches	
1.2	Picks up	
1.3	Handles	
1.4	Shakes/waves	
1.5	Pats/bangs	
1.6	Pushes/pulls	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(2.3.2) TACTILE CONTACT: Sensory Tray: Objects *(- wet)*

PRESENTATION CUES

(a) Present first container - *Name & Look*

(b) Demonstrate item - *Name & Look*

(c) Physical prompt - *Name & Look*

WITHDRAW STIMULUS: "Gone"

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Touches	
1.2	Picks up	
1.3	Pats/bangs	
1.4	Scoops/fills	
1.5	Pours	
1.6	Shakes/waves	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(2.3.3) TACTILE CONTACT: Sensory Tray: Objects *(- wet)*

PRESENTATION CUES

(a) Present second container - *Name & Look*

(b) Demonstrate item - *Name & Look*

(c) Physical prompt - *Name & Look*

WITHDRAW STIMULUS: "Gone"

TRIALS		
1	2	3

ADAPTATION		
1.0	RESPONSE	
1.1	Touches	
1.2	Picks up	
1.3	Pats/bangs	
1.4	Scoops/fills	
1.5	Pours	
1.6	Shakes/waves	
1.7	Relates 2 plus objects	
2.0	EXPRESSION	
2.1	Vocalises	
2.2	Claps hands	
3.0	ORIENTATION	
3.1	Relates to self	
3.2	Relates to other person	
4.0	DENIAL	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	DISCONTINUED	

(2.3.4) TACTILE CONTACT: Sensory Tray: Objects *(- wet)*

PRESENTATION CUES

(a) Present third container - *Name & Look*

(b) Demonstrate item - *Name & Look*

(c) Physical prompt - *Name & Look*

WITHDRAW STIMULUS: "Gone"

TRIALS		
1	2	3

ADAPTATION		
1.0	**RESPONSE**	
1.1	Touches	
1.2	Picks up	
1.3	Pats/bangs	
1.4	Scoops/fills	
1.5	Pours	
1.6	Shakes/waves	
1.7	Relates 2 plus objects	
2.0	**EXPRESSION**	
2.1	Vocalises	
2.2	Claps hands	
3.0	**ORIENTATION**	
3.1	Relates to self	
3.2	Relates to other person	
4.0	**DENIAL**	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	**DISCONTINUED**	

(2.4.1) TACTILE CONTACT: Sensory Tray: Water *(+ wet)*

PRESENTATION CUES

(a) Present item - *Name & Look*

(b) Demonstrate item - *Name & Look*

(c) Physical prompt - *Name & Look*

WITHDRAW STIMULUS: "Gone"

TRIALS		
1	2	3

ADAPTATION		
1.0	**RESPONSE**	
1.1	Touches	
1.2	Picks up	
1.3	Handles	
1.4	Shakes/waves	
1.5	Pats/bangs	
1.6	Pushes/pulls	
2.0	**EXPRESSION**	
2.1	Vocalises	
2.2	Claps hands	
3.0	**ORIENTATION**	
3.1	Relates to self	
3.2	Relates to other person	
4.0	**DENIAL**	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	**DISCONTINUED**	

(2.4.2) TACTILE CONTACT: Sensory Tray: Objects *(+ wet)*

PRESENTATION CUES

(a) Present first container - *Name & Look*

(b) Demonstrate item - *Name & Look*

(c) Physical prompt - *Name & Look*

WITHDRAW STIMULUS: "Gone"

TRIALS		
1	2	3

ADAPTATION		
1.0	**RESPONSE**	
1.1	Touches	
1.2	Picks up	
1.3	Pats/bangs	
1.4	Scoops/fills	
1.5	Pours	
1.6	Shakes/waves	
2.0	**EXPRESSION**	
2.1	Vocalises	
2.2	Claps hands	
3.0	**ORIENTATION**	
3.1	Relates to self	
3.2	Relates to other person	
4.0	**DENIAL**	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	**DISCONTINUED**	

(2.4.3) TACTILE CONTACT: Sensory Tray: Objects *(+ wet)*

PRESENTATION CUES

(a) Present second container - *Name & Look*

(b) Demonstrate item - *Name & Look*

(c) Physical prompt - *Name & Look*

WITHDRAW STIMULUS: "Gone"

TRIALS		
1	2	3

1.0	**RESPONSE**	
1.1	Touches	
1.2	Picks up	
1.3	Pats/bangs	
1.4	Scoops/fills	
1.5	Pours	
1.6	Shakes/waves	
1.7	Relates 2 plus objects	
2.0	**EXPRESSION**	
2.1	Vocalises	
2.2	Claps hands	
3.0	**ORIENTATION**	
3.1	Relates to self	
3.2	Relates to other person	
4.0	**DENIAL**	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	**DISCONTINUED**	

(2.4.4) TACTILE CONTACT: Sensory Tray: Objects *(+ wet)*

PRESENTATION CUES

(a) Present third container - *Name & Look*

(b) Demonstrate item - *Name & Look*

(c) Physical prompt - *Name & Look*

WITHDRAW STIMULUS: "Gone"

TRIALS		
1	2	3

ADAPTATION		
1.0	**RESPONSE**	
1.1	Touches	
1.2	Picks up	
1.3	Pats/bangs	
1.4	Scoops/fills	
1.5	Pours	
1.6	Shakes/waves	
1.7	Relates 2 plus objects	
2.0	**EXPRESSION**	
2.1	Vocalises	
2.2	Claps hands	
3.0	**ORIENTATION**	
3.1	Relates to self	
3.2	Relates to other person	
4.0	**DENIAL**	
4.1	Withdraws	
4.2	Pushes away	
4.3	Consumes	
5.0	**DISCONTINUED**	

5. I.S.E. PROGRAMME PLAN

CLIENT:_____ **DATE:** _____ **THERAPIST:** _____

PROGRAMME DIMENSIONS	DETAILS
RESPONSE REPERTOIRE: (R) RESPONSE (E) EXPRESSION (O) ORIENTATION 1. PERSON 2. OBJECT 3. EVENT	1. (R) (E) (O) 2. (R) (E) (O) 3. (R) (E) (O)
DEFINITION OF ROLE: 1. SUPPORT CUES (P) PRESENTATION (R) RECURRENCE 2. RATE OF INTERACTION 3. INTERACTION RESPONSE LEVEL	1. (P) (R) 2. 3.
GROUP DYNAMICS: 1. PEER ORIENTATION 2. STAFF ORIENTATION 3. DURATION OF ORIENTATION	1. 2. 3.
ENVIRONMENT: 1. SPACE REQUIREMENTS 2. FURNISHINGS	1. 2.
ACTIVITIES: 1. CHOICE 2. TURN-TAKING 3. JOINT ATTENTION 4. CONTACT 5. DENIAL	1. 2. 3. 4. 5.

APPENDIX C6

6. I.S.E. THERAPY LOG SHEET						
ENGAGEMENT REPERTOIRE	**ROLE DEFINITION**	**GROUP DYNAMICS**	**ENVIRONMENT**	**ACTIVITIES**	**ACTION**	**DATE/ INITIAL**
[P]						
[O]						
[P]						
[O]						

7. *ENGAGEMENT BACKGROUND QUESTIONNAIRE*

CLIENT'S NAME:	**QUESTIONNAIRE DATE:**
COMPLETED BY:	**RELATION TO CLIENT:**

INSTRUCTIONS: *The questionnaire is devised to gather information on the engagement background of the client. It should be completed by one who has known the client long enough to be a significant other in their life, and to be familiar with the client's pattern of responding.*

Consider the following statements under lettered sections based on knowledge of the client. Tick the appropriate space by judging the validity of each statement according to defined response choices.

There is a choice between 3 responses for each statement. Please fill in only one space per statement. Read the definitions for the response categories provided below before completing the questionnaire.

All completed questionnaires will be dealt with confidentially.

RESPONSE CHOICE	DEFINITION
1. YES	Fairly typical of the client and occurs often during a day.
2. NO	Not at all typical of the client and does not occur during a day.
3. SOMETIMES	Not typical of the client but occurs sporadically or some of the time.

SECTION A: SELF ENGAGEMENT

CODE	DESCRIPTIVE STATEMENTS	YES	NO	SOME-TIMES
1	Client engages in rocking behaviour.			
2	Client bounces up and down repetitively on feet or seat.			
3	Client spins self around repetitively whilst standing.			
4	Client sways head from side to side repetitively.			
5	Client performs ritualistic head and arm gestures.			
6	Client flicks fingers repetitively in front of eyes and face.			
7	Client engages in anal/oral behaviour inappropriately.			
8	Client masturbates in inappropriate/public places.			
9	Client engages in self-injurious behaviour.			
10	Client manipulates own clothing repetitively.			
11	Client touches self repetitively.			
12	Client utters bizarre, irrelevant verbalisations.			
13	Client emits screams not obviously related to distress.			
14	Client makes repetitive non speech sounds.			
15	Client picks up scraps from floor and other surfaces.			
16	Client manipulates objects in a ritualistic way, i.e. spinning.			
17	Client re-arranges items of furniture repetitively.			
18	Client picks threads/hairs off other person.			
19	Client performs specific aggressive acts to other person.			
20	Client moves position/limbs of other person repetitively.			

TOTALS (n)			

SECTION B: PERSON ENGAGEMENT

CODE	DESCRIPTIVE STATEMENTS	YES	NO	SOME-TIMES
1	Client reaches for/touches person in social contact.			
2	Client looks closely at another person's face.			
3	Client smiles/vocalises sociably to another person.			
4	Client imitates the actions of another person, i.e. waving goodbye.			
	TOTALS (n)			

SECTION C: PERSON ENGAGEMENT

CODE	DESCRIPTIVE STATEMENTS	YES	NO	SOME-TIMES
1	Client reaches for/touches items placed in front of him/her.			
2	Client picks up item(s) presented without a prompt.			
3	Client examines item(s) by handling and looking closely.			
4	Client uses item(s) presented in usual or acceptable way.			
	TOTALS (n)			

SECTION D: PERSON-OBJECT ENGAGEMENT

CODE	DESCRIPTIVE STATEMENTS	YES	NO	SOME-TIMES
1	Client joins in activity with at least one other person.			
2	Client gives item(s) to another person without a prompt.			
3	Client shows activity or item to another person.			
4	Client indicates to another person a desired item or activity.			
	TOTALS (n)			

8. INSTRUCTIONS FOR ISSUING ENGAGEMENT BACKGROUND QUESTIONNAIRE

I ADMINISTRATION

1. *One questionnaire to be completed with the key significant other who has known the client for a minimum of 6 months.*

2. **One questionnaire to be completed with a second significant other who has also known the client for a minimum of 6 months.*

3. **One questionnaire to be completed with one of the two significant others on the same client, but at a separate time a week later. No reference is made to previously completed questionnaire.*

4. *Interviewer to sit with significant other to guide completion of the questionnaire, and to insure against collaborative effort with colleague(s).*

5. *The questionnaire should be completed all at once and not divided amongst several sessions.*

6. *The questionnaire may be re-issued at pre-arranged intervals, between sequential phases of an intervention programme or at designated re-assessment intervals. Where possible, it is desirable for the questionnaire to be completed with the same significant other(s).*

**refers to reliability measures for research purposes*

II INSTRUCTIONS

SAY TO THE SIGNIFICANT OTHER:

"Thank you for agreeing to help me in filling out this questionnaire on 'X'. The information gathered in this questionnaire will treated confidentially. There are 4 sections in the questionnaire: section A is longer than the other three, which are only short."

PRESENT QUESTIONNAIRE TO SIGNIFICANT OTHER:

"Please read the words on the front of the questionnaire carefully, which will explain briefly what is required of you."

WAIT FOR THE PERSON TO FINISH READING AND THEN SAY:

"Do you understand what is required?"

IF THE PERSON REPLIES IN THE NEGATIVE, GIVE EXAMPLES OF THE RESPONSE CHOICES AS DEFINED BELOW:

YES	The client does this most days and fairly regularly. It is characteristic of the way this client performs.
NO	The client does not do this. It has not been observed/noticed as part of the general responding behaviour of the client.
SOMETIMES	The client does this sometimes but it is not a regular feature of daily behaviour. Its occurrence has been noticed on occasions. This the response choice to use when unsure if it is a YES or NO.

THEN SAY:

"Please chose an appropriate response to each statement as I read them out. If you run into any difficulties or do not understand a statement, please ask for assistance so that an example may be given to you. I am here to help you in the completion of this questionnaire."

III SUPPORT STATEMENTS AND EXAMPLES

When help is requested by the significant other, read out the statement again and follow it with the appropriate support statement/example from those listed below. Always follow this by asking:

"Is it a YES, NO or SOMETIMES?"

ITEM	SUPPORT STATEMENT
A.1	Client rocks self too and fro, whilst sitting or standing, in a repetitive, rhythmic way.
A.2	Client bounces or jumps up and down, whilst sitting or standing, in a repetitive, rhythmic way.
A.3	Client turns body around at a fast rate as though twirling or spinning - usually in an upright position.
A.4	Client moves head and neck from side to side in a weaving motion from left to right (or vice versa) in a repetitive, rhythmic way.
A.5	Client moves hands and arms in bizarre shapes and actions, that does not seem to be usual or normal gesture, and is repetitive in type.
A.6	Client twiddles fingers in front of eyes and face at a fast, repetitive rate.
A.7	Client puts hands to mouth/anus and moves hands/fingers in the relevant area(s) at regular intervals.
A.8	Clients plays with own genitalia at inappropriate times and in unacceptable situations, i.e. during on task activity; in the high street.
A.9	Client hits self or forces own body to impact with inanimate object, likely to cause self harm, i.e. head banging; head slapping; hair pulling; hand biting.
A.10	Client adjusts own clothing repetitively and may flick the edge of a garment vigorously.
A.11	Client moves hands/fingers over own body constantly, touching self in a way that cannot be said to self-injurious.
A.12	Client says whole phrases in an echoed way but inappropriately. Usually the utterance is said with similar intonation and volume, and is spoken suddenly with out relevance to ongoing activity.
A.13	Client screeches/screams suddenly and repeatedly without relevance to any ongoing activity. There is no obvious connection with an upset for the client.
A.14	Client makes sounds which do not seem to bear a likeness to speech sounds, i.e. smacking lips; blowing raspberries.
A.15	Client picks up bits of fluff, paper, twigs, leaves and other scraps from the floor, ground or other surfaces.
A.16	Client performs repetitive, rhythmic actions on an object that do not demonstrate the usual function of that item, i.e. spinning; turning; flicking.

ITEM	SUPPORT STATEMENT
A.17	Client moves items of furniture, performing minor adjustments to their position, i.e. chairs; litter bins; tables.
A.18	Client picks up threads, hairs, bits of fluff off other person's clothing and body. This is done in a quite impersonal way.
A.19	Client regularly pushes other person away, displaying some aggression, or performs specific acts to other person likely to cause them pain/harm, i.e. hair pulling; pinching; biting; hitting.
A.20	Client adjusts the body postures and positions of another person(s), i.e. uncrossing legs; unfolding arms.

ITEM	SUPPORT STATEMENT
B.1	Clients moves hand/arm towards another person and may make contact with that person's body.
B.2	Client regards the features of another person's face, clearly demonstrating eye contact.
B.3	Client smiles and/or vocalises when other person is in close proximity so as to notice this response. This usually occurs when other person newly moves into the client's horizon.
B.4	Client immediately copies the action or gesture of another person, usually without prompt and quite spontaneously.

ITEM	SUPPORT STATEMENT
C.1	Client spontaneously and without prompt will reach arms/hands to item placed in front and may touch it.
C.2	Client will pick up item placed in front, which may be a task, i.e. educational/leisure activity, spontaneously and without prompt.
C.3	Client will investigate item by handling and looking closely. Various actions/operations are tried out on the item to explore its properties.
C.4	Client uses item in usual or expected way, demonstrating functional knowledge of item, i.e. pen to paper; cassette in recorder; washing up liquid in bowl. This statement does not describe the functional use of items to do with food and drink.

ITEM	SUPPORT STATEMENT
D.1	Clients participates in same activity as another person, using the same equipment/objects in a co-operative way that shows evidence of notice of other person's actions.
D.2	Client spontaneously and without prompt presents items to another person, i.e. books; magazines; television remote control; dish cloth.
D.3	Client will present own accomplishment to another person for attention/recognition/commendation, i.e. completed picture; empty plate;
D.4	Client will communicate an idea to another person by pointing, gesturing, vocalising. This idea is usually something that the client desires, such as: a drink; an item of equipment; an activity.

IV SCORING SYSTEM

SECTION(S)	SCORING
SECTION A	• YES : 2 • NO : 0 • SOMETIMES : 1
SECTIONS B, C & D	• YES : 2 • NO : 0 • SOMETIMES : 1

SCORING:

Complete questionnaire score form using the system defined in the grid above. Use comparative scores from separate time periods to compute changes in client's engagement behaviour.

9. SUMMARY OF PILOT ENGAGEMENT CATEGORIES

CATEGORY A: SELF ENGAGEMENT	
1. Self-Intimate	Participant is engaged in private/personal activities, which is coded as such, but not observed/video recorded, in order that the person's right to privacy is preserved at all times. This category includes: personal hygiene; toiletting; epileptic fits; and other intimate behaviours.
2. Self-Neutral	Participant is engaged in usual body actions, postures, routine events, which are a part of everyday life. This category includes: just sitting; walking; looking around; gazing straight ahead; sleeping; eating; drinking; and other neutral behaviours.
3. Self-Active	Participant is engaged in non-purposeful activity, which is not goal or person oriented. This may be repetitive, stereotypic, self-injurious or self stimulatory in type. This includes the following: rocking; twirling; bizarre verbalisations; striking self; ritualistic actions; finger flicking; and other self-active behaviours.
CATEGORY B: PERSON ENGAGEMENT	
1. Person	Participant engages in purposeful actions with at least one other person, clearly demonstrating an awareness of/contact with that person, by overt behaviour emitted when other person is in close vicinity. This category includes: eye contact; smiling; vocalising; reaching; pointing; grabbing; touching; use of gesture/speech; and other person contact behaviours.
CATEGORY C: OBJECT ENGAGEMENT	
1. Object	Participant engages in actions with at least one object in a purposeful manner, clearly demonstrating an awareness of/contact with that object(s), by overt behaviours. This category includes: looking; reaching; touching; patting; grabbing; picking up; pushing; pouring; and other object contact/exploratory behaviour.
CATEGORY D: PERSON-OBJECT ENGAGEMENT	
1. Person-Object	Participant engages in event participation that comprises at least one other person and at least one object, clearly demonstrating an awareness of/contact with both elements, by overt behaviours emitted. Participant involves person and object in joint action. This category includes: sharing item(s) with other person; co-operative activity; intentional communication; and other event participation behaviours.
MISCELLANEOUS	
Out of View	Participant is out of view, either due to obstruction in environment or because of sudden movement of participant completely or out of observation frame.

Table C9.1: Category Definitions Used in Pilot Study 1

10. MANUAL FOR NATURALISTIC OBSERVATIONS

I. ORIENTATION:

1. Momentary time sampling is a means of producing records of client behaviour intermittently.

2. It is a means of collecting data through naturalistic observations and avoids the artificiality of a standardised assessment procedure.

3. It is a procedure whereby one records the occurrence or non-occurrence of a response or behaviour at the end of a specified interval.

4. In order to protect data from contamination due to the effects of illness or epileptic seizure, data collection is spread over time.

5. A classification system for coding participant activity which is broadly similar is employed.

II. PROCEDURE:

1. A 15 minute sample is collected for each participant on a different day and at a different time.

2. Suggested time periods are:
   * 10.00 - 11.00am.
   * 11.00 - 12.00pm.
   * 1.30 - 2.30pm.
   * 2.30 - 3.30pm.

3. Each participant should have a baseline comprising data collected in each of the identified time periods, making a total observation time of 1 hour for each assessment/re-assessment interval per participant.

4. Momentary Time Sampling (M.T.S.) values of 10, 20 and 30 seconds may be used for this purpose as recommended by Brulle & Repp, 1984. Caution is observed with values of 60 seconds and above.

5. The observer maintains impartiality to others in the immediate environment in order to minimise the effects of observer reactivity.

6. Moments and their intervals are identified by pre-recorded bleeps on a tape played back through a portable cassette player with ear phones.

7. Subsequent to the moment to be sampled, a delay of 3 seconds is set in order to determine whether the observed behaviour is purposeful or not. This is recorded on the tape as a preliminary bleep 3 seconds before the bleep signalling the moment to be sampled.

7. Using the appropriate form, the observer records the occurrence or the non occurrence of the target behaviour at the end of the pre-specified interval.

8. Participants are observed at pre-arranged times and according to availability.

9. Prior to arranging times to observe the participant, the observer determines those periods of activity in which observation would be unsuitable, so that they may be avoided.

10. Times of certain activity to be avoided are:
    * music/disco/dance
    * personal/intimate activity/bath time
    * watching television/video

11. The observer settles into the observation environment at least 5 minutes before the commencement of the actual recording, in order to minimise the effects of observer reactivity.

III. RULES:

1. The categories: *SELF-INTIMATE; SELF-NEUTRAL; SELF-ACTIVE;* are all mutually exclusive and can not occur together.

2. The categories: *SELF-INTIMATE* and *SELF-NEUTRAL* are also mutually exclusive to all the other categories and may only occur in isolation.

3. The category: *SELF-ACTIVE* may occur at the same time as: *PERSON; OBJECT* and *PERSON-OBJECT* engagement, and if the participant engages in two different acts simultaneously, both should be recorded.

4. The respect and dignity of the participant should be observed at all times. Observations should not take place within the defined areas of *SELF-INTIMATE* engagement. If a participant should move into such an area during a timed observation, the observer codes engagement to *SELF-INTIMATE* until the participant re-enters the public area.

5. The observer should be familiar with and confident in the use of the defined categories of engagement for the efficient and reliable coding of participant behaviour.

TARGET BEHAVIOUR	*DEFINITION*	*ELABORATION*	*EXAMPLES*	*QUESTIONABLE INSTANCES*
SELF-INTIMATE ENGAGEMENT	A non obtrusive code designed to describe personal or private activities which may take place in secluded areas. The behaviour is not viewed in order to preserve the respect and dignity of the participant at all times. Should a participant move to a similarly identified area, the observation period is completed as the observer continues to code activity to this category. In the event of grand-mal epileptic seizure, seen by chance in a public place, coding continues as defined.	The participant is: • engaged in personal hygiene • engaged in toilet routine • experiencing grand mal epileptic seizure	The participant is: • going to the toilet • being changed • washing • dressing • undressing • brushing teeth • epileptic seizure (grand mal)	The participant is: • using personal items in public view, code as **SELF-NEUTRAL** • sleeping in public view, and not in own bedroom, code as **SELF-NEUTRAL**

TARGET BEHAVIOUR	*DEFINITION*	*ELABORATION*	*EXAMPLES*	*QUESTIONABLE INSTANCES*
SELF-NEUTRAL ENGAGEMENT	The participant is engaged in routine tasks, doing nothing specifically (Pope, 1988).Usual body actions are observed and passive responding to the actions of others. No rhythm; ritual; repetition is observed to be intrinsic to the behaviour. The participant is said to be neutrally engaged (Felce, 1986).	The participant is: • engaged in usual body actions • engaged in routine tasks • complying passively with the actions of others	The participant is: • sitting • standing • lying • sleeping • walking • pushing a wheelchair • pushing a walking frame • fiddling with hair/buttons • scratching self • rubbing ears/nose • eating/drinking • waiting/looking around • gazing straight ahead • passively responding to actions or manipulation of other person	The participant is: • engaged in repetitive self manipulations such as twisting ears, swaying head, code as **SELF-ACTIVE** • engaged in ritualistic actions with a routine item such as spinning a cup, striking head with fork, code as **SELF-ACTIVE** • sitting down whilst engaged in person contact or object activity, code as **PERSON** or **OBJECT** • engaged in repetitive clothes manipulation, code as **SELF-ACTIVE**

TARGET BEHAVIOUR	*DEFINITION*	*ELABORATION*	*EXAMPLES*	*QUESTIONABLE INSTANCES*
SELF-ACTIVE ENGAGEMENT	The participant is engaged in behaviour which is said to be personally or socially maladaptive (Sebba & Hogg, 1986a). These are non purposeful movements characterised by repetition; environmental independence; irrelevance to any ongoing activity; highly predictable feedback (Richer, 1979).	The participant performs fine and gross motor actions which are: • repetitive and often rhythmic in nature • not connected in any meaningful way with the environment (lack of apparent function) • apparently not specifically goal oriented	The participant is: • rock/bounce/twirling • hand flapping • head sway/weaving • strike/bite/pinch self • force body into contact with object in non accidental way • finger flick/pill roll • bizarre vocal/verbal • bizarre hand/arm gestures • unusual tongue action (not related to structural/motoric difficulties) • repetitive clothes manipulation • ritualistic person or object manipulation	The participant is: • licking lips, rubbing nose/ears, or other small body behaviours, code as **SELF-NEUTRAL** • passively responding to actions of others, such as swaying to music , code as **SELF-NEUTRAL** • standing up at intervals and pacing around, code as **SELF-NEUTRAL** • performing non specific actions with objects such as waving, shaking, code as **OBJECT** • fiddling in a non specific way with own clothing, jewellery or personal possessions, code as **SELF-NEUTRAL**

TARGET BEHAVIOUR	*DEFINITION*	*ELABORATION*	*EXAMPLES*	*QUESTIONABLE INSTANCES*
PERSON ENGAGEMENT	The participant is engaged in interpersonal relations with peer group and others (Bangs, 1982). Interactions occur in such a way that they mutually influence each other (Chapman, 1981).	The participant: • occupies the same vicinity as at least one other person, within approximately 3 feet (unless it is a clear communication by words, gesture or body language to an identifiable person). • shows notice of another person in a clear, overt way. • displays appropriate adaptive responding that is directed to an identified person.	The participant: • looks at, smiles at, vocalises to another person • reaches for, touches, grabs other person • points to, uses appropriate gesture/words to other person	The participant is: • co-operating with other person in self care or other activity, code as **SELF-NEUTRAL** • appearing to direct eye gaze to unseen person(s) or source of sound, such as looking to a door when an approach is heard, code as **SELF-NEUTRAL** • passively responding to actions of other , such as co-operative dancing/music/movement, code as **SELF-NEUTRAL** • looking towards other person more than 3 feet away, so that person contact is not identifiable, code as **SELF-NEUTRAL**

TARGET BEHAVIOUR	*DEFINITION*	*ELABORATION*	*EXAMPLES*	*QUESTIONABLE INSTANCES*
OBJECT ENGAGEMENT	The participant is engaged in manipulative schemes applied to objects and their relations in space (Uzguris & Hunt, 1975; Dunst, 1980). The development of visual pursuit and object permanence is apparent, fixation, tracking and other active engagement with objects (Hogg & Sebba, 1986a).	The participant is: • overtly attending to an identifiable object • exploring/examining an object by own actions or manipulations • combining more than one object in an activity • expressing an idea via gesture/vocalisation directed towards an identifiable object.	The participant: • looks, tracks, searches, reaches for, touches, grasps an object • performs non specific actions - bangs, shakes, waves, mouths, drops, throws, relates to self • relates objects together - banging • systematically combines - stacking, piling • uses functionally - pouring, scooping, stirring, cutting, spreading, painting	The participant engages in: • ritualistic action with object - spin/ turn/flicking, code as **SELF-ACTIVE** • routine object action - eating/drinking code as **SELF-NEUTRAL** • Passive co-action - signing, code as **SELF-NEUTRAL** • holding onto an object without purposeful activity, code as **SELF-NEUTRAL** • absent minded touching of object observable intention, code as **SELF-NEUTRAL** • non specific fiddling with clothing, code as **SELF-NEUTRAL**

TARGET BEHAVIOUR	*DEFINITION*	*ELABORATION*	*EXAMPLES*	*QUESTIONABLE INSTANCES*
PERSON-OBJECT ENGAGEMENT	The participant emits some movement or sound in which eye contact is alternated between object and person (Bates, 1976; Bruner, 1978). Their is the co-ordination of individual actions and their use in producing an effect on the environment (Hogg & Sebba, 1986a). The participant combines the constituents of person and object in one or several fluid actions.	The participant: • performs actions on an object whilst looking at another person, or else alternating gaze between both constituent elements of the interaction • spontaneously gives object to other person, demonstrating appropriate direction/orientation to that other person • directs other persons attention to a desired item/location by appropriate gesture, vocalisation, orientation to that other person	The participant: • gives, shows, receives with open arms, points out an object(s) • looks from person to object and back to person, as in turn-taking • anticipates object to be offered by other person	The participant engages in: • solitary manipulation of object in coincidental presence of other person, code as **OBJECT** • passive co-action - pouring a drink code as **SELF-NEUTRAL** • coincidentally holding object whilst interacting with other, code as **PERSON** • fiddling with clothes, other personal items whilst interacting with other, code as **PERSON**

TARGET BEHAVIOUR	*DEFINITION*	*ELABORATION*	*EXAMPLES*	*QUESTIONABLE INSTANCES*
OUT OF VIEW	The participant is temporarily unseen due to a change in environmental circumstances.	The participant: is not in the observer's view field due to one of the listed examples.	• moves out of immediate view • turns away from the observer and it is impossible to decipher the category of engagement • is temporarily shielded by other person or object • is only partially in view, rendering decision-making on engagement category impossible	

11. OBSERVATION CHECK SHEET: 10 SEC. INTERVAL

PARTICIPANT: _____ **CONTEXT:**

OBSERVER: _____

DATE: _____ **TIME:** _____

CATEGORIES OF ENGAGEMENT BEHAVIOUR

SAMPLE INTER-VALS	SELF-INTIM-ATE	SELF-NEUTRAL	SELF-ACTIVE	PERSON	OBJECT	PERSON - OBJECT	OUT OF VIEW
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

SAMPLE INTER-VALS	SELF-INTIM-ATE	SELF-NEUTRAL	SELF-ACTIVE	PERSON	OBJECT	PERSON - OBJECT	OUT OF VIEW
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							
52							
53							
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55							
56							
57							
58							
59							
60							
61							
62							
63							
64							
65							
66							
67							
68							
69							
70							
TOTAL (n)							
PERCEN-TAGE (%)							

1. LIST OF EQUIPMENT FOR THE PLACEBO CONDITION (ACTION-PERFORMANCE THERAPY)

1. Set of common objects (hairbrush, cup, toothbrush, comb, spoon, knife, fork, plate, sponge, soapbox, flannel).

2. Set of matching pictures for the objects.

3. Two reactive objects:
   - visual shaker;
   - auditory shaker.

4. A choice of equipment designed for use with people with special needs, the visual and auditory channels providing the principle feedback features.

2. STRUCTURE OF A.P. THERAPY SESSION

The structure of a session using the previously listed equipment in **Appendix D1** was as follows:

(i) Symbolic Use of Objects:

- The objects are presented individually to the participant for the demonstration of symbolic use.
- A hierarchy of verbal support cues is used to provide the relevant and appropriate assistance to the participant.

(ii) Location of Objects:

- Groups of three objects are presented to the participant for correct location.
- A standard verbal stimulus with sign support for each object label is used, i.e. "Find the cup".

(iii) Identification of Objects:

- The objects are individually presented to the participant for labelling.
- An initial standard verbal stimulus is used which is further backed up by defined support cues to assist the participant to form an appropriate sign:
  - "What is it?"
  - Label object and sign to cue imitation.
  - Label object and co-sign with participant.

(iv) Matching Object to Picture:

- A standard set of object pictures is presented to the participant and labelled using the 'Identification of Objects' hierarchy of support cues.
- A group of 3 pictures is set out before the participant at any one time.

- The objects are individually presented to the participant for picture matching using a hierarchy of support cues:
  - Verbal stimulus: *"Find one"*
  - Verbal stimulus with location gesture.
  - Verbal stimulus with physical prompt of participant.

(v) Object Operation:

- An auditory and visual shaker are presented for examination.
- A hierarchy of support cues is employed:
  - verbal stimulus to attend object
  - demonstration of object properties
  - physical prompt to engage in object activity.

(vi) Object Activity:

- An item from a range of specially designed equipment is presented to the participant for active engagement.
- A hierarchy of support cues is used to assist the participant to engage in relevant activity with the chosen pieces of equipment:
  - Item is presented
  - Item is demonstrated
  - Physical prompt to engage in object activity.

3. DESCRIPTION OF STIMULI USED IN I.S.E. INTERVENTION

1. PERSON ENGAGEMENT	
a) Indirect non touch contact.	Neither the item or the therapist is in touch contact with the participant, i.e. air wafts using a fan.
b) Indirect touch contact.	The item is in touch contact with the participant but the therapist is not, i.e. battery operated brush massager; soft brush.
c) Direct touch contact.	Both the item and the therapist are in touch contact with the participant, i.e. talc; cream/lotion; moisture wipes.
d) Direct vibro-touch contact.	An item which emits vibrations in direct contact with the participant's skin surface, i.e. body massager.
e) Vestibular.	Two plains of stimulation are used: • linear - rocking sleigh • angular - rotation in 'executive' swivel chair.
2. OBJECT ENGAGEMENT	
a) Wet touch contact.	A "wet" item, or one that leaves a deposit on the hands is presents, i.e. body mousse/foam.
b) Dry touch contact.	A "dry" item, or one that does not leave a deposit on the hands, but contains a liquid substance inside it, is presented, i.e. water filled specially reinforced rubber ball.
c) Vibro touch contact.	An item which emits vibrations upon touch contact from the participant.
d) Sensory Tray. • Dry touch contact.	A tray filled with a granular substance, i.e. lentils, for the touch contact of the participant, to which 1, 2 and 3 containers is added as appropriate.
• Wet touch contact.	A tray filled with a liquid substance for the touch contact of the participant, to which 1, 2, and 3 containers is added as appropriate.

1. TABLES AND FIGURES OF ASSESSMENT DATA FOR INDIVIDUAL PARTICIPANTS

Data is presented for individual participants in the order of their designated therapy groups and by Experimental Group. Textual accounts of the progress made by individuals is provided. The numbering in brackets is provided in reference to the relevant assessment point.

Group 1.1: Participant D.B.

CATEG-ORY	DATA POINT 1		DATA POINT 2		DATA POINT 3		DATA POINT 4		DATA POINT 5		DATA POINT 6	
	n	%	n	%	n	%	n	%	n	%	n	%
Self-Neutral	5.13	7.32	4.88	6.97	15.63	22.32	2.75	3.92	6.5	9.28	3.5	5
Self-Active	56.81	81.15	33.63	48.04	31.63	48.18	44.44	63.48	32.88	46.97	41.75	59.64
Person	1.44	2.05	0.5	0.71	1.88	2.68	4.19	5.98	2.88	4.11	0.13	0.18
Object	6.5	9.28	28.5	40.71	6.63	9.47	14.44	20.62	18.63	26.6	23.88	34.1
Person-Object	0	0	2	2.85	1	1.42	0.19	0.27	1.38	1.97	0.25	0.35
Self-Intimate	0	0	0	0	11.75	16.78	4	5.71	7.5	10.7	0	0
Out of View	0	0	1	1.42	1.5	2.14	0	0	0.25	0.35	0.5	0.71

Table E1.1: Assessment Data for Participant D.B. in Therapy Group 1.1

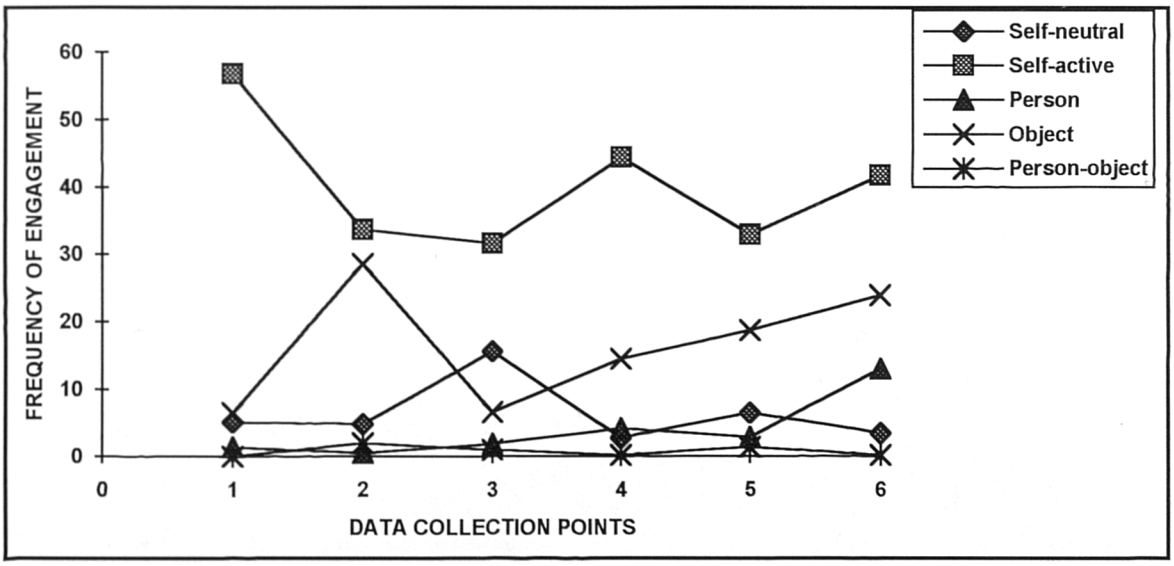

Figure E1.1: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant D.B. (Therapy Group 1.1)

D.B. of 1.1: D.B. was a male, diagnosed as profoundly hearing impaired with upper and lower limb mobility problems. At baseline (1), D.B. displayed high levels *of self-active* behaviour which reduced dramatically after the first phase of **I.S.E.** therapy (2). An increase in *object* engagement was also revealed. The **A.P.** phase (3) showed virtual stability in the level of *self-active*, a sharp drop in *object* and a small rise in *self-neutral*. The second phase of **I.S.E.** therapy has not had quite the effect of the first phase: a small rise in *self-active* and *object,* and a drop in *self-neutral*. Follow up data revealed an initial decline in *self-active* followed by a small increase at the second follow up point (6). A steady rise in *object* engagement was revealed and a new increase in *person* engagement.

Group 1.1: Participant J.C.

CATEG-ORY	DATA POINT 1		DATA POINT 2		DATA POINT 3		DATA POINT 4		DATA POINT 5		DATA POINT 6	
	n	%	n	%	n	%	n	%	n	%	n	%
Self-Neutral	21.5	30.7	18.75	26.78	24.38	34.82	12.75	18.21				
Self-Active	45.88	65.42	14.19	20.27	16.25	23.21	26.56	37.94				
Person	0.75	1.07	9.94	14.2	7.94	11.34	4.56	6.51				
Object	0.25	0.35	23.63	33.75	3.19	4.5	21.44	30.62				
Person-Object	0	0	0.5	0.71	0	0	3.19	4.5				
Self-Intimate	1.25	1.78	0	0	0	0	1.5	2.14				
Out of View	0.25	0.35	2.25	3.21	2.25	3.21	0	0				

Table E1.2: Assessment Data for Participant J.C. in Therapy Group 1.1

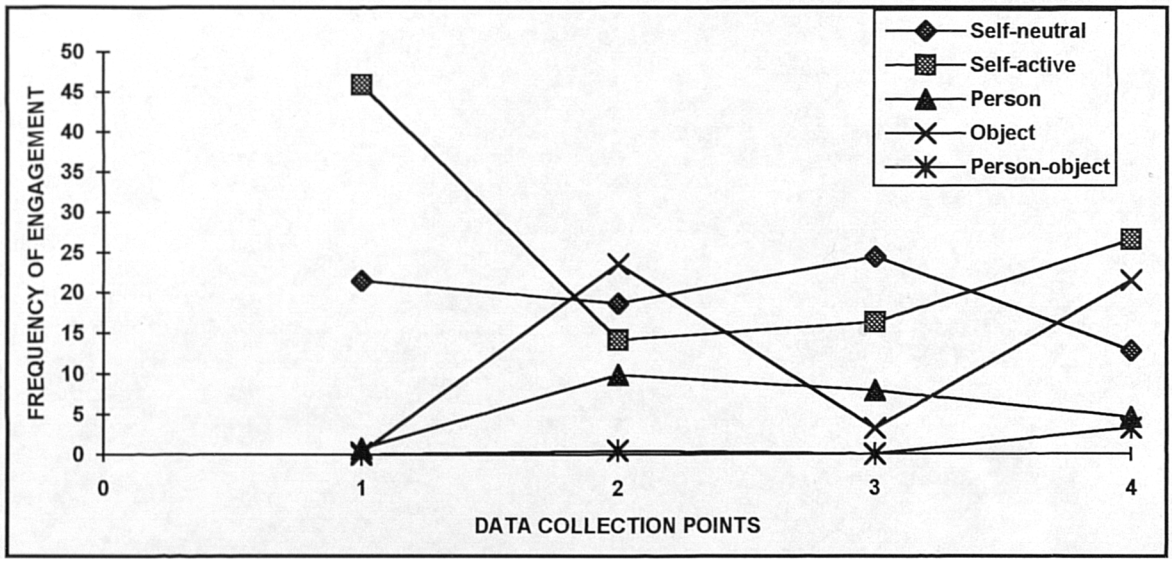

Figure E1.2: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant J.C. (Therapy Group 1.1)

J.C. of 1.1: J.C. was female and had no additional sensory or other impairments diagnosed. At baseline (1), J.C. displayed high levels *of self-active* behaviour which reduced after the first phase of **I.S.E.** therapy (2), where a large increase in *object* and to a lesser degree, *person* was observed. The **A.P.** phase (3) showed the virtual stability in the level of *self-active*, a sharp drop in the *object* and a small rise in *self-neutral* behaviour. The second phase of **I.S.E.** therapy has not had quite the effect of the first phase with its small rise in *self-active,* although *object* appeared to regain its former level and *person-object* was seen to emerge. The two follow-up data points (5) and (6) were not completed on this participant due to a residential move from the borough.

Group 1.1: Participant T.M.

CATEG-ORY	DATA POINT 1		DATA POINT 2		DATA POINT 3		DATA POINT 4		DATA POINT 5		DATA POINT 6	
	n	%	n	%	n	%	n	%	n	%	n	%
Self-Neutral	26	37.14	17.5	25	21.13	30.18	26.25	37.5	23.25	33.21	14.75	21.07
Self-Active	42.63	60.9	26.94	38.48	36.31	51.87	18.56	26.51	36.25	51.78	51.5	73.57
Person	0.38	0.54	3	4.28	7.69	10.98	4.56	6.51	2.5	3.57	3.5	5
Object	0.75	1.07	17.31	24.72	1.88	2.68	16.69	23.84	1.88	2.68	0	0
Person-Object	0	0	4.5	6.42	0.88	1.25	3.81	5.4	0.25	0.35	0	0
Self-Intimate	0	0	0	0	1.25	1.78	0	0	3.5	5	0	0
Out of View	0.25	0.35	0.25	0.35	0.87	1.24	0.12	0.17	0.5	0.71	0.25	0.35

Table E1.3: Assessment Data for Participant T.M. in Therapy Group 1.1

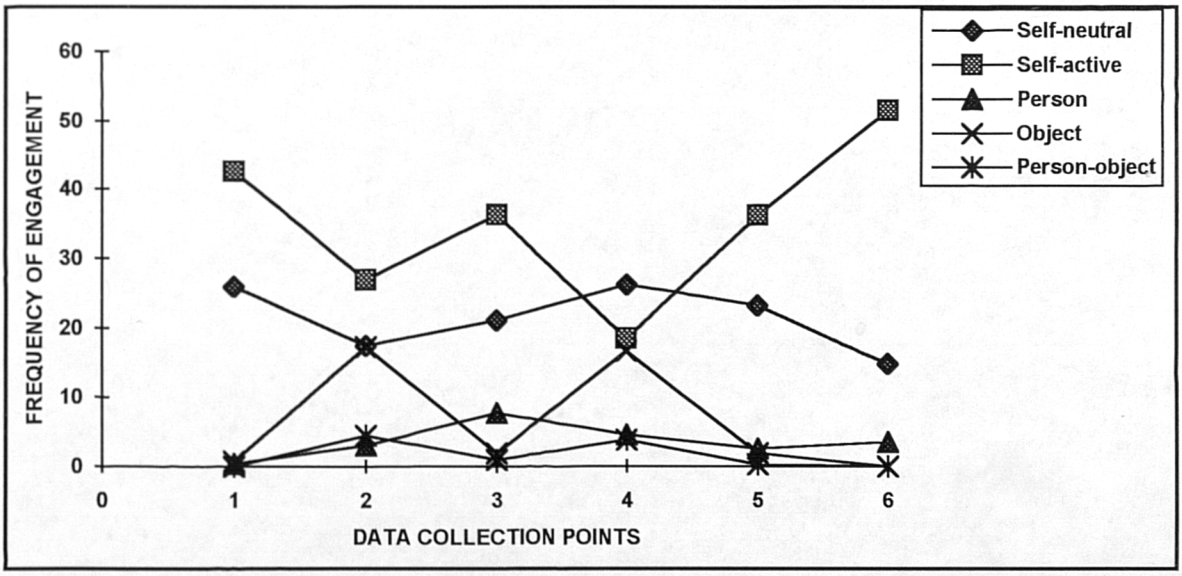

Figure E1.3: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant T.M. (Therapy Group 1.1)

T.M. of 1.1: T.M. was female. She had no additional sensory or other impairments diagnosed. She was reported to have Turner's syndrome. At baseline (1), T.M. displayed high levels *of self-active* behaviour which reduced after the first phase of **I.S.E.** therapy (2), where an increase in *object* engagement and to a much lesser degree, *person* and *person-object* engagements was observed. The **A.P.** therapy phase (3), whilst showing a small gain in person engagement, appeared to reverse some of the gains made in the first **I.S.E.** phase (2). After the second phase in **I.S.E.** therapy (4), *object* engagement rose almost to its former level with a sharp drop in *self-active* behaviour. S*elf-neutral* engagement also showed a small increase at point (4) where a small rise in *person-object* engagement was observed. The two follow-up data points (5 and 6) revealed a dramatic increase in the level of *self-active* engagement, which would seem to correspond with a reduction in the other forms of engagement, i.e. *person* and *object.*

Group 1.1: Participant R.A.

CATEG-ORY	DATA POINT 1		DATA POINT 2		DATA POINT 3		DATA POINT 4		DATA POINT 5		DATA POINT 6	
	n	%	n	%	n	%	n	%	n	%	n	%
Self-Neutral	32.38	46.25	25.83	36.9	50.25	71.78	33	47.14	34.5	49.28	54.25	77.5
Self-Active	22.38	31.97	0.17	0.24	0	0	0	0	0	0	0	0
Person	0	0	13.5	19.28	10.13	14.47	12.75	18.21	8.75	12.5	3.5	5
Object	11.88	16.85	12.67	18.1	2.63	3.75	21.5	30.71	21.75	31.07	11	15.71
Person-Object	0	0	15.33	21.85	1	1.42	2	2.85	3.75	5.35	1.25	1.78
Self-Intimate	0	0	0	0	0	0	0	0	0	0	0	0
Out of View	3.37	4.81	2.5	3.57	6	8.57	0.75	1.07	1.25	1.78	0	0

Table E1.4: Assessment Data for Participant R.A. in Therapy Group 1.1

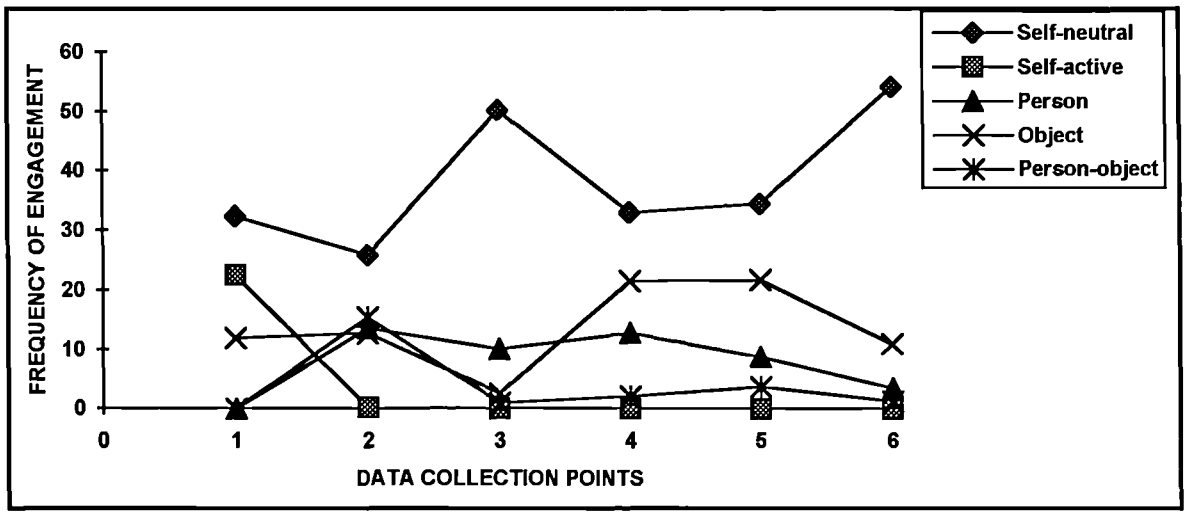

Figure E1.4: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant R.A. (Therapy Group 1.1)

R.A. of 1.1: R.A. was female and had no additional sensory or other impairments diagnosed. At baseline (1), R.A. displayed moderate levels *of self-active* which reduced after the first phase of **I.S.E.** therapy (2). It was then maintained through subsequent assessments, where an increase in *person* and *person-object* engagements occurred. The *self-active* behaviour identified for this participant was *'touching self and clothing repetitively'*. This behaviour was viewed to be minor compared with those exhibited by R.A.'s peers, and as such may have been responsive to the therapy. *Self-neutral* engagement reduced slightly. The **A.P.** phase (3) showed a large increase in the level of *self-neutral* behaviour which may be due to the level of complexity of **A.P.** items, i.e. response demands were more sophisticated. Declines in *person-object* and *object* were also revealed. *Person* engagement showed a minor reduction in level. After the second phase in **I.S.E.** therapy (4), *object* engagement rose above its former level with a sharp drop in *self-neutral* behaviour. *Person-object* showed a small increase at point (4) together with *person*. The first follow-up data point (5) revealed virtual maintenance of all engagement levels apart from a minor rise in *person-object* and a small decline in *person* contact. However at data point (6) there was a sharp increase in *self-neutral* behaviour with declines in all the other forms of engagement, i.e. *person*, *object* and *person-object*.

Group 1.2: Participant V.K.

CATEG-ORY	DATA POINT 1 n	%	DATA POINT 2 n	%	DATA POINT 3 n	%	DATA POINT 4 n	%	DATA POINT 5 n	%	DATA POINT 6 n	%
Self-Neutral	20.13	28.75	63.13	90.18	48.5	69.28	51.13	73.04	51.33	73.28	56	80
Self-Active	47.13	67.32	0	0	3.88	5.42	3.06	4.37	0.33	0.47	9.75	13.97
Person	2.25	3.21	3.5	5	11.75	16.78	15.44	22	14	20	4	5.71
Object	0	0	0.25	0.35	0	0	0	0	0.33	0.47	0	0
Person-Object	0	0	0	0	0	0	0	0	0	0	0	0
Self-Intimate	0	0	0	0	4.75	6.78	0	0	3.6	5.14	0	0
Out of View	0	0	2.25	3.21	1	1.42	0.25	0.35	0.33	0.47	0.25	0.35

Table E1.5: Assessment Data for Participant V.K. in Therapy Group 1.2

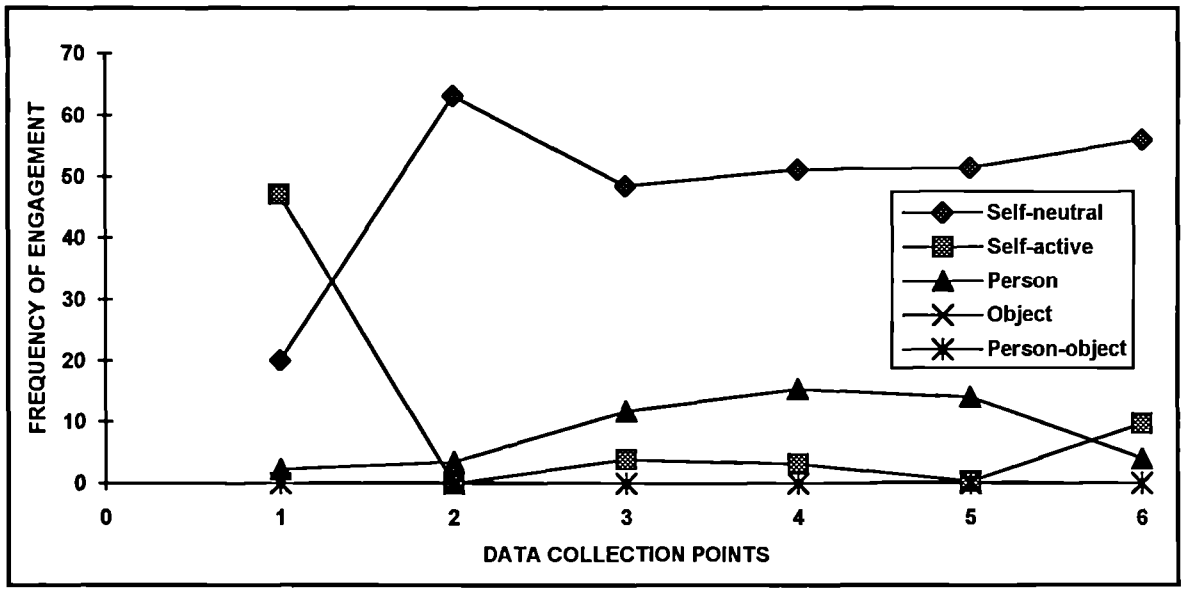

Figure E1.5: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant V.K. (Therapy Group 1.2)

V.K. of 1.2: V.K. was female. She had a mild hearing loss. She had hypotonia which resulted in severe difficulties in the initiation of planned, voluntary movement, both of upper and lower limbs. At baseline (1), V.K. displayed high levels *of self-active* behaviour which reduced dramatically after the first phase of **I.S.E.** therapy (2), where an increase in *object* engagement was observed. The **A.P.** phase (3) showed the virtual stability of the level of *self-active* behaviour, a sharp drop in the *object* and a small rise in *self-neutral*. The second phase of **I.S.E.** therapy has not had quite the effect of the first phase with its small rise in *self-active* engagement. *Object* engagement rose slightly with a drop

in *self-neutral*. The two follow-up assessments showed a steady rise in *object*, a decline then a rise in *self-active*, and a new increase in *person* engagement.

Group 1.2: Participant P.R.

CATEG-ORY	DATA POINT 1 n	%	DATA POINT 2 n	%	DATA POINT 3 n	%	DATA POINT 4 n	%	DATA POINT 5 n	%	DATA POINT 6 n	%
Self-Neutral	7.5	10.7	13.75	19.64	9.13	13.04	17.75	25.35	24.75	35.35		
Self-Active	60.31	86.15	38.31	54.72	52.06	74.37	42.69	60.98	34.5	49.28		
Person	0.88	1.25	6.19	8.84	3.06	4.37	4.69	6.7	1.38	1.97		
Object	0.44	0.62	8.06	11.51	4.38	6.25	4.38	6.25	9.13	13.04		
Person-Object	0	0	0.18	0.25	0	0	0.13	0.18	0.25	0.35		
Self-Intimate	0	0	0	0	0	0	0	0	0	0		
Out of View	1.25	1.78	3.25	4.64	1.25	1.78	0.25	0.35	0	0		

Table E1.6: Assessment Data for Participant P.R. in Therapy Group 1.2

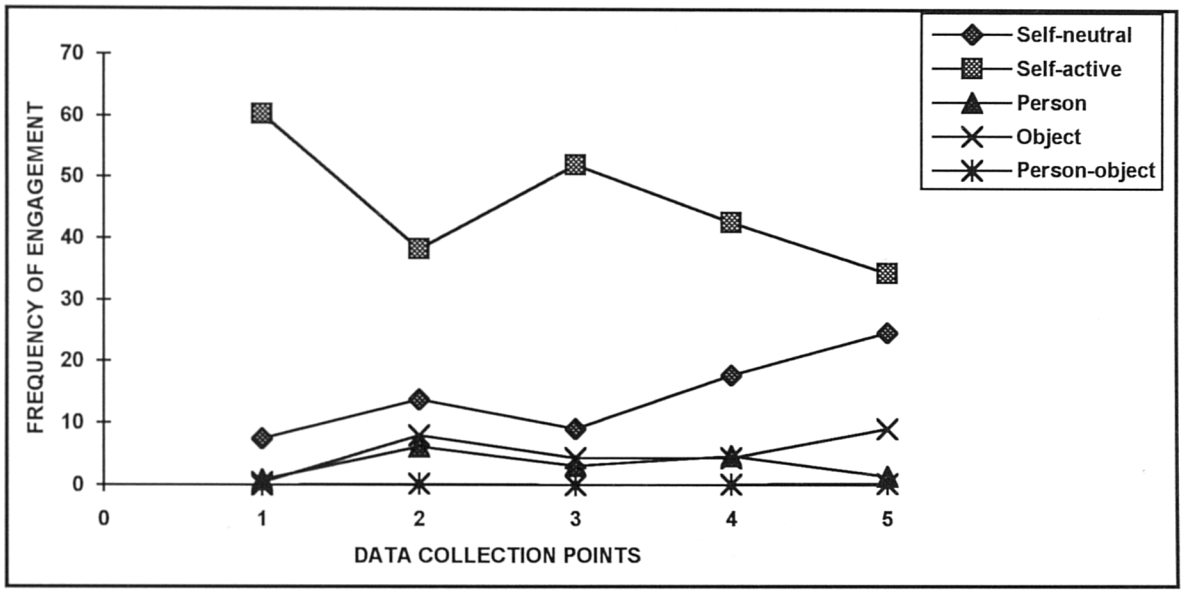

Figure E1.6: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant P.R. (Therapy Group 1.2)

P.R. of 1.2: P.R. was male. He had been diagnosed as having a moderate to severe hearing loss, although at the time of the study he was not using any hearing aid(s). At baseline (1), P.R. displayed high levels *of self-active* behaviour which reduced after the first phase of **I.S.E.** therapy (2), where small increases in *self-neutral*, *object* and *person* engagements were observed. The **A.P.** phase (3) showed a rise in the level of *self-active* behaviour, with much smaller reductions in *self-neutral*,

object and *person* engagement. The second phase of **I.S.E.** therapy has had a lesser effect on *person* and *object* engagement and a greater one on *self-neutral*. *Self-active* engagement starts to decline, whilst *self-neutral* engagement shows a small gain with *person* and *object less so.* Only one follow up point was completed on the participant P.R. due to his departure from the Day Centre. Follow up data revealed the continued rise of *self-neutral*, the decline in *self-active,* with a small gain in *object* engagement (5).

Group 1.2: Participant G.C.

CATEG-ORY	DATA POINT 1		DATA POINT 2		DATA POINT 3		DATA POINT 4		DATA POINT 5		DATA POINT 6	
	n	%	n	%	n	%	n	%	n	%	n	%
Self-Neutral	19	27.14	19.25	27.5	23.88	34	20.25	28.92	19	27.14	9.5	13.57
Self-Active	50.13	71.61	32.38	46.25	25.63	36.61	37.44	53.42	38.13	54.47	57.75	82.24
Person	0.13	0.18	9	12.85	9.69	13.84	8.31	11.87	10.13	14.47	2.75	3.92
Object	0	0	6.19	8.84	6.88	9.71	1.69	2.41	1.25	1.78	0	0
Person-Object	0	0	2.31	3.3	3.81	5.4	1.94	2.7	0.5	0.71	0	0
Self-Intimate	0	0	0	0	0	0	0	0	0	0	0	0
Out of View	1	1.42	0.5	0.71	0	0	0.25	0.35	1	1.42	0	0

Table E1.7: Assessment Data for Participant G.C. in Therapy Group 1.2

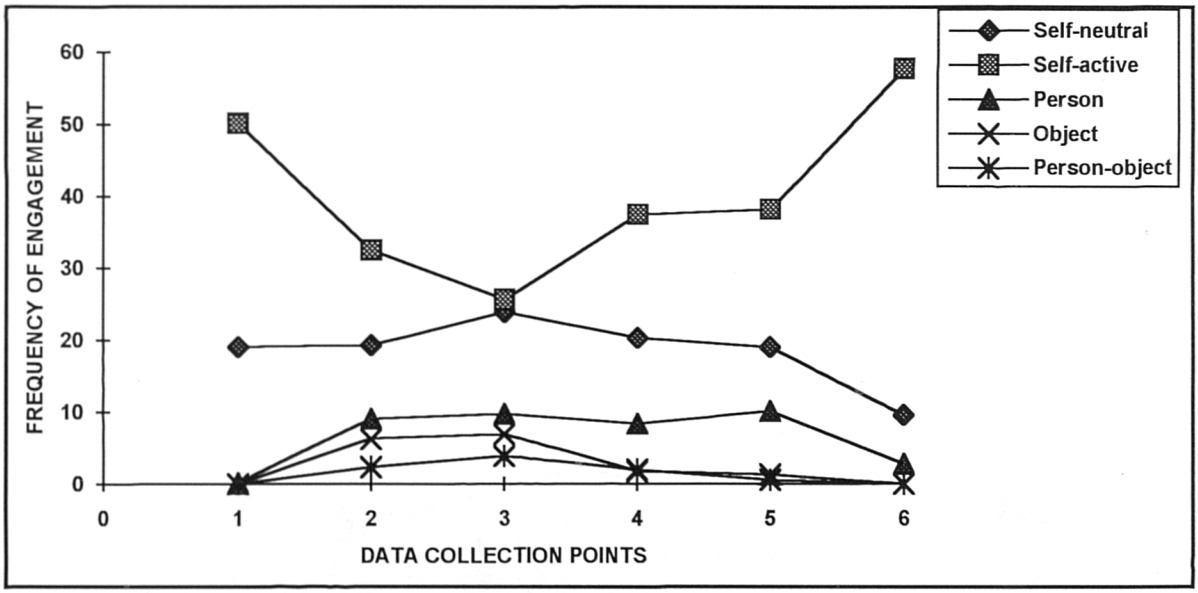

Figure E1.7: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant G.C. (Therapy Group 1.2)

G.C. of 1.2 : G.C. was female and had no additional sensory or other impairments diagnosed. At baseline (1), G.C. displayed high levels *of self-active* behaviour which came down after the first phase of **I.S.E.** therapy (2), where small increases in *person* and *object* engagement were observed, together with a minor emergence of *person-object*. *Self-neutral* appeared relatively stable at this stage (2). The **A.P.** phase (3) showed a continued decline in the level of *self-active* behaviour although less so, with a small rise in *self-neutral* engagement. *Person* and *object* engagement appeared relatively stable whilst a minor gain in *person-object* was observed at this point. After the second phase in **I.S.E.** therapy (4), there was a surprising rise in *self-active*, whilst *self-neutral, person* and *object* engagement declined. Only *person* engagement maintained its level. This needs to be seen in the context of other external influences which may have adversely effected the participant's engagement behaviour. The management of the participant's supported home had been changed together with the almost total replacement of the staff team. The participant G.C. appeared increasingly distressed at this change and was reported to suffer from insomnia. She also engaged in high levels of nocturnal self-injury, resulting in extensive tissue damage to head and face, and there was later some question of abuse. This undoubtedly contributed to the negative effect seen in the participant's engagement levels at point (4) which coincided with the external events. Follow up point (5) showed relative stability in all the categories of engagement, but point (6) revealed a definite decline in *self-neutral* and *person,* together with a dramatic rise in *self-active* behaviour, just beyond its former level at baseline (1).

Group 2.1: Participant M.W.

CATEG-ORY	DATA POINT 1		DATA POINT 2		DATA POINT 3		DATA POINT 4		DATA POINT 5		DATA POINT 6	
	n	%	n	%	n	%	n	%	n	%	n	%
Self-Neutral	24.25	34.64	24.13	34.47	18.25	26.07	30.75	43.92	31.75	45.35	22.5	32.14
Self-Active	34.69	49.5	32.5	46.42	35.25	50.35	29.13	41.61	34	48.57	38.13	54.47
Person	0.38	0.54	0.88	1.25	3.25	4.64	3.13	4.47	1	1.42	0.38	0.54
Object	3.31	4.72	3.31	4.72	9	12.85	5.31	7.58	3	4.28	3.25	4.64
Person-Object	0	0	0	0	2.75	3.92	0.69	0.98	0	0	0	0
Self-Intimate	0	0	1.62	2.32	0	0	0	0	0	0	5.5	7.85
Out of View	7.37	10.52	8.12	11.6	1.5	2.14	1	1.42	0	0	0.25	0.35

Table E1.8: Assessment Data for Participant M.W. in Therapy Group 2.1

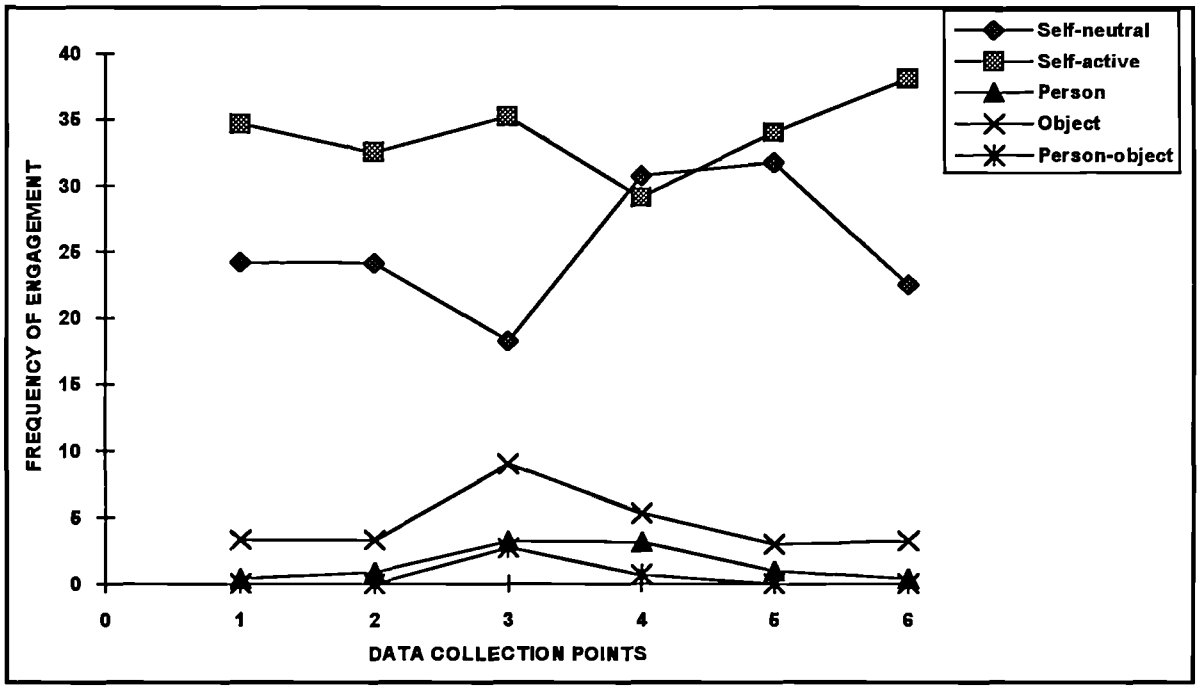

Figure E1.8: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant M.W. (Therapy Group 2.1)

M.W. of 2.1: M.W. was male. He had Down's Syndrome and has no additional sensory or other impairments diagnosed. At baseline (1), M.W. displayed high levels *of self-active* behaviour which decreased only slightly after the first phase of **A.P.** therapy. *Self-neutral, person* and *object* engagement remained virtually unchanged. After the first phase of **I.S.E.** therapy at data point (3), the most obvious changes were a sharp decline in *self-neutral* and an increase in *object*, and less so in *person* and *person-object* engagement. The **A.P.** phase (4) showed a sharp rise in the level of *self-neutral* behaviour, with smaller reductions in *self-active*, *object* and *person-object* engagement. *Person* engagement maintained its previous level. Follow up point (5) showed a small decline in *object, person* and *person-object* engagement, a rise in *self-active* and less so in *self-neutral*. The second follow up point (6) revealed a further rise in *self-active* and a large decline in *self-neutral,* approximately to their former levels at baseline (1).

Group 2.1: Participant G.B.

CATEG-ORY	DATA POINT 1 n	%	DATA POINT 2 n	%	DATA POINT 3 n	%	DATA POINT 4 n	%	DATA POINT 5 n	%	DATA POINT 6 n	%
Self-Neutral	52	74.28	43.38	61.97	43.88	62.68	56.38	80.54	51.75	73.92	64.75	92.5
Self-Active	4.38	6.25	3.38	4.82	0.06	0.08	8.13	11.61	8.25	11.78	0.25	0.35
Person	6.63	9.47	2.63	3.75	10.88	15.54	4.25	6.07	4	5.7	2.5	3.57
Object	0.38	0.54	11.75	16.78	9.06	12.94	0	0	1.25	1.78	0.75	1.07
Person-Object	0	0	7.75	11.07	1.25	1.78	0	0	0.25	0.35	0	0
Self-Intimate	0.5	0.71	0	0	0.5	0.71	0	0	0.75	1.07	0	0
Out of View	6	8.57	1.5	2.14	4.87	6.95	1.25	1.78	3.57	5.1	1.75	2.5

Table E1.9: Assessment Data for Participant G.B. in Therapy Group 2.1

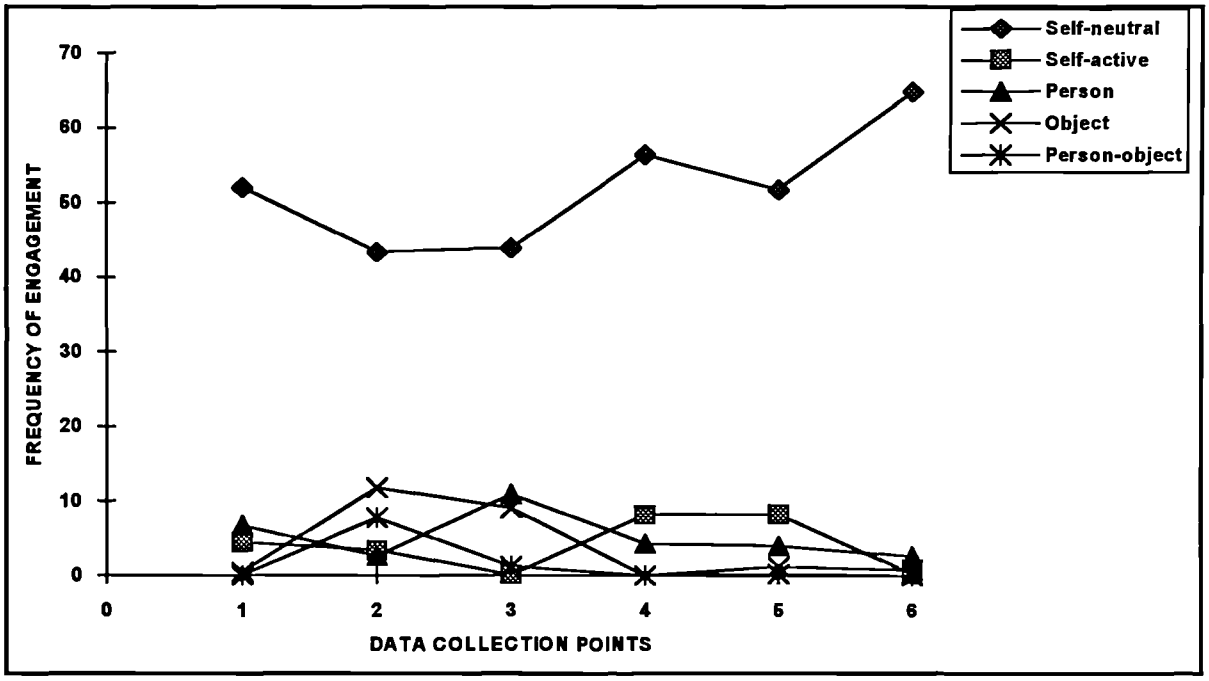

Figure E1.9: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant G.B. (Therapy Group 2.1)

G.B. of 2.1: G.B. was male. He had no additional sensory or other impairments diagnosed. At baseline (1), G.B. displayed high levels of *self-neutral* behaviour which reduced only slightly after the first phase of **A.P.** therapy. *Self-active* behaviour was at a much reduced level compared to the other participants in the sample population. *Object* and *person-object* engagement showed a small rise with a small decline in *person* engagement. The first phase of **I.S.E.** therapy (3), showed relative

stability in *self-neutral*, a rise in *person* and a corresponding decline in *person-object* engagement. *Object* behaviour only reduced slightly. The **A.P.** phase (4) effected rises in the level of *self-neutral* behaviour and less so in *self-active*, with small reductions in *person*, *object* and *person-object* engagement. Levels appear to be maintained at follow up point (5) all apart from a small dip in *self-neutral*. Follow up point (6) showed reductions in *self-active*, *object*, *person* and *person-object* engagement, with a rise in *self-neutral* to above its former level at baseline (1).

There were no obvious or clear differences between engagement levels at the various data points apart from a decline in *self-neutral* at (2) which was maintained at point (3). By referring to the later **Table E2.21**, which summarises the 'form of stimulation or specification of activities' for G.B.'s therapy programme, it may be seen that a number of forms of stimuli were not included in the **I.S.E.** programme. This was mainly due to the participant's aversive reaction to them, i.e. he physically withdrew. The common feedback feature in the rejected items was: (+ wet), that is they left a deposit on the skin when manipulated or touched. This restricted some of the opportunities available to the participant G.B. in the context of his therapy group, as he became wary of his peers using similar items in his vicinity, and suspicious of contact with many tactile items. Hence it was not clear whether the items in the **I.S.E.** therapy represented truly motivating consequences for this participant.

Group 2.1: Participant L.C.

CATEG-ORY	DATA POINT 1		DATA POINT 2		DATA POINT 3		DATA POINT 4		DATA POINT 5		DATA POINT 6	
	n	%	n	%	n	%	n	%	n	%	n	%
Self-Neutral	54	77.14	60.25	86.07	46.88	66.97	52.25	74.64	65.25	93.21	44.66	63.8
Self-Active	15.75	22.5	6.88	9.82	16.75	23.92	14.94	21.32	4.5	6.42	22.66	32.37
Person	0	0	2.13	3.04	6.13	8.75	2.94	4.2	0.25	0.35	0.66	0.94
Object	0.25	0.35	0.25	0.35	0	0	0	0	0	0	0	0
Person-Object	0	0	0	0	0	0	0	0	0	0	0	0
Self-Intimate	0	0	0	0	0	0	0	0	0	0	0	0
Out of View	0	0	0.5	0.71	0.25	0.35	0	0	0	0	2	2.85

Table E1.10: Assessment Data for Participant L.C. in Therapy Group 2.1

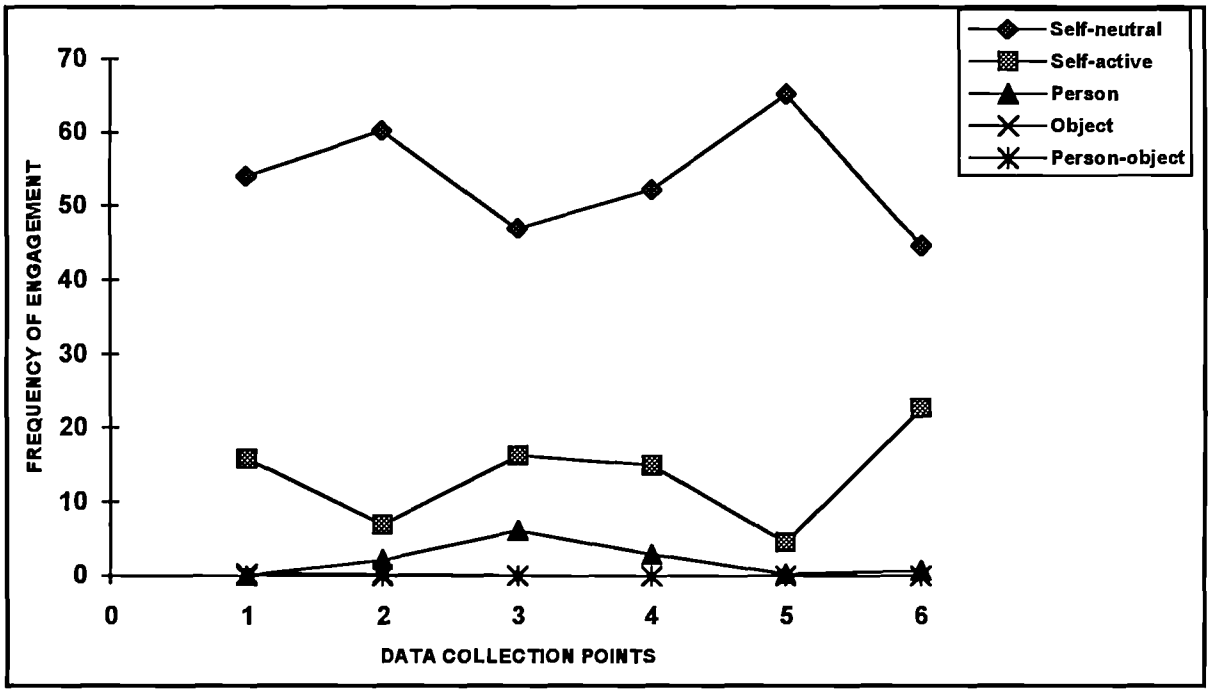

Figure E1.10: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant L.C. (Therapy Group 2.1)

L.C. of 2.1: L.C. was female and had no additional sensory or other impairments diagnosed. At baseline (1), L.C. displayed high levels *of self-neutral* behaviour which rose slightly after the first phase of **A.P.** therapy (2). *Self-active* was at a relatively low level at baseline compared to participants from other groups and reduced at data point (2). After the first phase of **I.S.E.** therapy (3), *self-active* appeared to revert to its former level shown at (1), with a larger decline in *self-neutral* behaviour. *Person* showed a small gain although no other changes were observed. The **A.P.** phase (4) shows relative stability in the level of *self-active* behaviour, with a small rise in *self*-neutral and decline in *person* engagement. Follow up point (5) showed a drop in *self-active* and a corresponding rise in *self-neutral*. The second follow up point (6) revealed a virtual reverse in these changes with a rise in *self-active* and a decline in *self-neutral* approximately to their former levels at baseline (1).

Group 2.1: Participant S.M.

CATEG-ORY	DATA POINT 1 n	%	DATA POINT 2 n	%	DATA POINT 3 n	%	DATA POINT 4 n	%	DATA POINT 5 n	%	DATA POINT 6 n	%
Self-Neutral	69.63	99.47	68	97.14	60	85.71	58.38	83.4	51	72.85	60.5	86.42
Self-Active	0	0	0	0	0	0	0	0	0	0	0	0
Person	0.38	0.54	2	2.85	9.75	13.92	6.63	9.47	10	14.28	2	2.85
Object	0	0	0	0	0	0	0	0	2.67	3.81	0	0
Person-Object	0	0	0	0	0	0	0	0	0	0	0	0
Self-Intimate	0	0	0	0	0	0	2.37	3.38	5.6	8	7.5	10.71
Out of View	0	0	0	0	0.25	0.35	0.37	0.52	0.6	0.85	0	0

Table E1.11: Assessment Data for Participant S.M. in Therapy Group 2.1

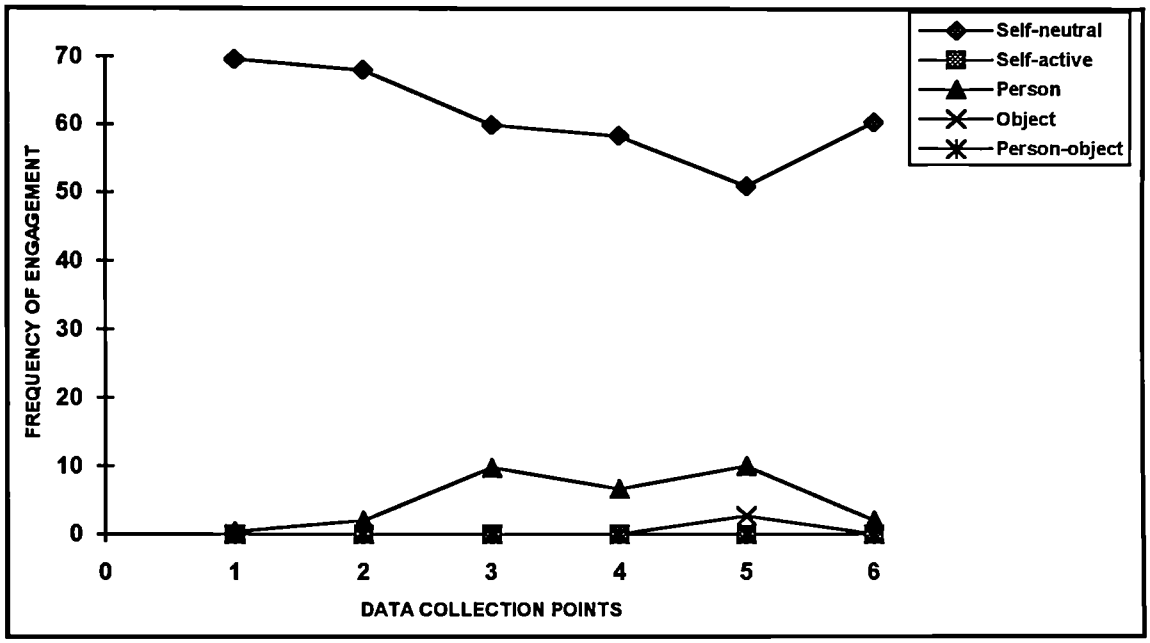

Figure E1.11: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant S.M. (Therapy Group 2.1)

S.M. of 2.1: S.M. was male and had no additional sensory or other impairments diagnosed. At baseline (1), S.M. displayed extremely high levels *of self-neutral* behaviour which showed small drops after the **I.S.E.** phase at point (3), and the first follow up at point (5). There were few observable changes in the other categories of engagement apart from *person* engagement which showed an increase after the first phase of **I.S.E.** therapy (3) and was virtually maintained at the subsequent points (4) and (5). *Self-active* was not observed amongst this participant's engagement

levels throughout the course of the project. The second follow up point (6) revealed a rise in *self-neutral* together with a decline in *person* engagement almost to their former levels at baseline (1).

Group 2.2: Participant T.T.

CATEG-ORY	DATA POINT 1 n	%	DATA POINT 2 n	%	DATA POINT 3 n	%	DATA POINT 4 n	%	DATA POINT 5 n	%	DATA POINT 6 n	%
Self-Neutral	18.38	26.25	20.88	29.82	17.75	25.35	32.88	46.97	28.5	40.71	34.5	49.28
Self-Active	29.44	42.05	13.31	19.01	9.94	14.2	4.38	6.25	1.87	2.67	30.75	43.92
Person	0.25	0.35	5.31	7.58	4.81	6.87	4.88	6.97	11	15.71	4.25	6.07
Object	20.94	29.91	23.5	33.52	33.69	48.12	14.75	21.07	21.87	31.04	0	0
Person-Object	0	0	0.88	1.25	1.94	2.7	4.5	6.42	1	1.42	0	0
Self-Intimate	0	0	0	0	0	0	2.25	3.21	3.25	4.64	0	0
Out of View	1	1.42	6.12	8.74	1.87	2.67	2.12	3.02	2	2.85	0.5	0.71

Table E1.12: Assessment Data for Participant T.T. in Therapy Group 2.2

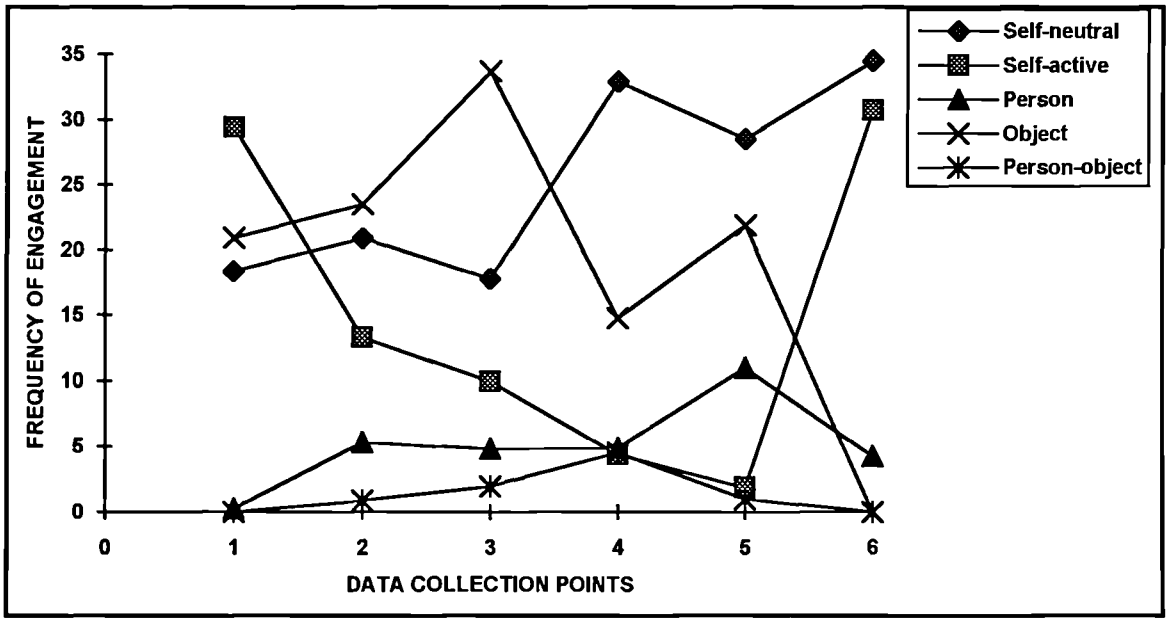

Figure E1.12: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant T.T. (Therapy Group 2.2)

T.T. of 2.2: T.T. was male. He had no additional sensory or other impairments diagnosed. At baseline (1), T.T. displayed high levels *of self-active* behaviour which reduced considerably after the first phase of **A.P.** therapy and continued to fall over the data points up to and including the first follow up point (5). At point (6), a dramatic rise sees it revert to its former level shown at baseline

(1). *Self-neutral, object* and *person* engagement showed small rises after the first **A.P.** phase (2). The first phase of **I.S.E.** therapy (3), revealed a reduction in *self-neutral* with a marked increase in *object* engagement, a minor rise in *person-object* and the relative stability of *person* behaviour. The **A.P.** phase (4) showed a sharp decline in the level of *object* behaviour, with a small rise in *person-object* engagement. *Person* engagement maintained its previous level. Follow up point (5) revealed the lowest level of *self-active* and a rise in *person* and *object* engagement, and a decline in *person-object.* The second follow up point (6) revealed a dramatic rise in *self-active* with corresponding declines in *person* and *object* engagement, the latter falling well below its former level at baseline. It is unclear why there should have been such a marked reduction in *object* engagement in the participant T.T. at point (6). A small rise in person engagement may explain a small proportion of this, but the majority appears to be accounted for by the rise in *self-neutral* behaviour which commenced after the second phase of **A.P.** therapy (4). It may be that the activities in **A.P.** did not provide sufficiently motivating consequences for the participant T.T. and provoked an initial rise in *self-neutral* behaviour at point (4) which was then maintained to the second follow up point at (6).

Group 2.2: Participant A.B.

CATEG-ORY	DATA POINT 1		DATA POINT 2		DATA POINT 3		DATA POINT 4		DATA POINT 5		DATA POINT 6	
	n	%	n	%	n	%	n	%	n	%	n	%
Self-Neutral	39.5	56.42	46.5	66.42	45.75	65.35	51.63	73.75	42.75	61.07	39.75	56.78
Self-Active	14.63	20.9	0	0	0	0	0	0	0	0	0	0
Person	3.25	4.64	4	5.71	12	17.14	6.75	9.64	9.5	13.57	6.5	9.28
Object	11.13	15.9	12.25	17.5	11	15.71	6.75	9.64	16.5	23.57	20.75	29.64
Person-Object	0	0	0	0	0.88	1.25	4.5	6.42	0.75	1.07	1.75	2.5
Self-Intimate	0	0	0.25	0.35	0	0	0	0	0	0	0	0
Out of View	1.5	2.14	5	7.14	0.37	0.52	0.37	0.52	0.5	0.71	1	1.42

Table E1.13: Assessment Data for Participant A.B. in Therapy Group 2.2

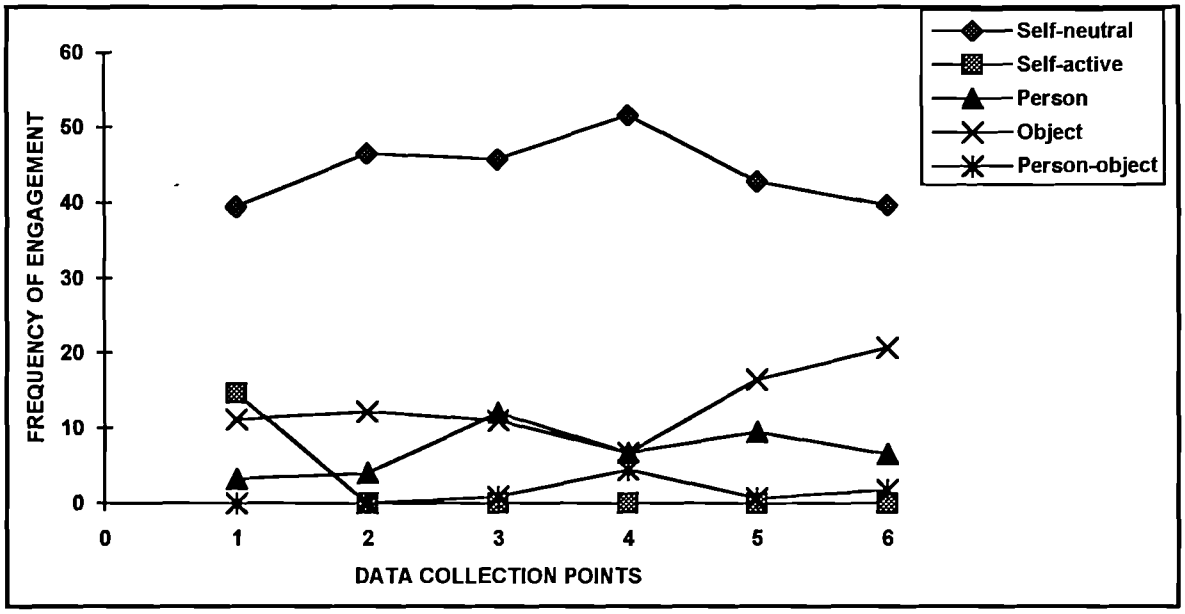

Figure E1.13: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant A.B. (Therapy Group 2.2)

A.B. of 2.2: A.B. was female. She was born with spina bifida and hydrocephalus. She used a wheelchair independently for her own mobility needs. At baseline (1), A.B. displayed high levels of *self-neutral* behaviour which showed little change other than a small rise after each **A.P.** phase at points (2) and (4). *Self-active* engagement dropped initially after the first **A.P.** phase (2) and did not re-emerge throughout the course of the study. *Object* engagement maintained virtual stability throughout the project although a small drop after the second A.P. phase was immediately followed by a steady growth at follow up points (5) and (6). The first phase of **I.S.E.** therapy (3), revealed the relative stability of all categories of engagement apart from a rise in *person* engagement. The **A.P.** phase (4) showed a decline in the levels of *person* and *object* behaviour, with a small rise in *person-object* engagement. The first follow up point (5) revealed a reduction in the level of *person-object* engagement, with a rise in *person* and *object* behaviour. The second follow up point (6) revealed a further rise in *object* with corresponding declines in *person* and *self-neutral* engagement, *object* engagement rising just above its former level at baseline.

Group 2.2: Participant P.G.

CATEG-ORY	DATA POINT 1		DATA POINT 2		DATA POINT 3		DATA POINT 4		DATA POINT 5		DATA POINT 6	
	n	%	n	%	n	%	n	%	n	%	n	%
Self-Neutral	40.75	58.21	37.88	54.11	41	58.57	41.13	58.75	29	41.42	29.13	41.61
Self-Active	11.25	16.07	3	4.28	10.94	15.62	12.25	17.5	19.13	27.32	2.38	3.4
Person	0.63	0.9	0.75	1.07	0.88	1.25	3.38	4.82	0	0	0	0
Object	17.38	24.82	9.88	14.1	17.19	24.5	12.5	17.85	20.38	29.11	0	0
Person-Object	0	0	0	0	0	0	0.38	0.54	0	0	0.25	0.35
Self-Intimate	0	0	8.62	12.31	0	0	0	0	0.25	0.35	37.75	53.92
Out of View	0.12	0.17	1.25	1.78	0.12	0.17	0	0	1.25	1.78	0.75	1.07

Table E1.14: Assessment Data for Participant P.G. in Therapy Group 2.2

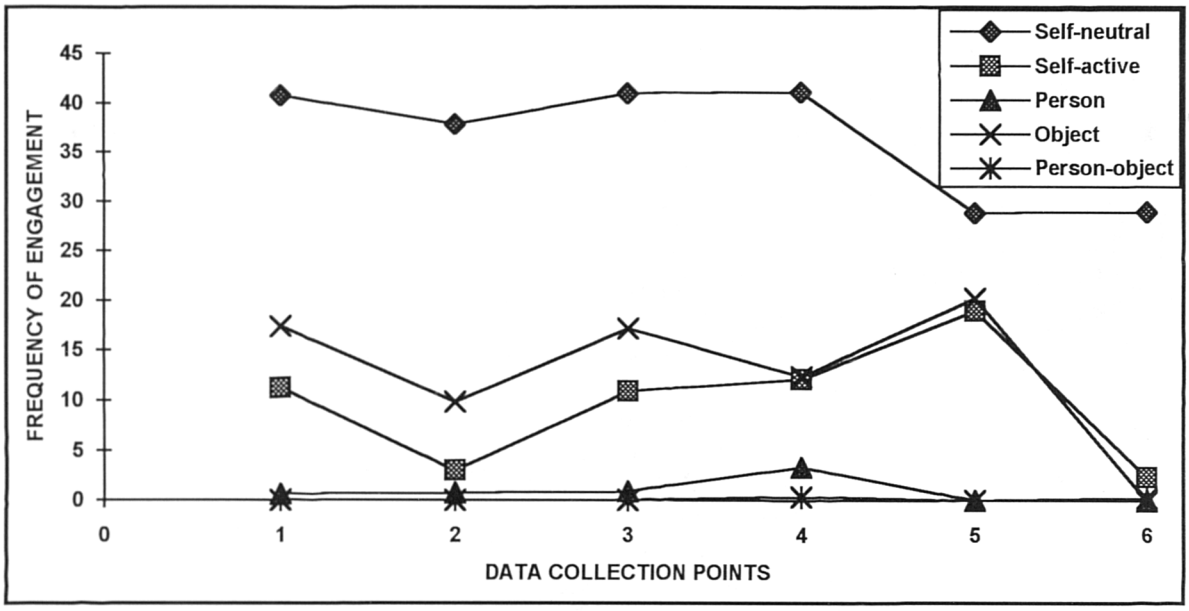

Figure E1.14: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant P.G. (Therapy Group 2.2)

P.G. of 2.3: P.G. was male. He had no additional sensory or other impairments diagnosed. At baseline (1), P.G. displayed high levels *of self-neutral* behaviour which showed little change other than a surprising decrease at the first follow up point (5), which was subsequently maintained at point (6). *Self-active* engagement declined initially after the first **A.P.** phase (2), rose at point (3) after **I.S.E.** therapy. *Object* engagement showed a small drop after the first A.P. phase and was immediately followed by a rise after **I.S.E.** therapy at point (3). The **A.P.** phase (4) effected a small rise in the level of *person* behaviour and *self-active* increases slightly. Follow up point (5) revealed a further increase in the level of *self-active* engagement, which dropped sharply at the second follow up

point (6) together with a decrease in *object* engagement. It would seem that the greatest effect to the level of *self-active* behaviour occurred at the second follow up assessment (6). However, the data have been effected by the level of *self-intimate* behaviour. This is shown in the previous **Table E1.14.** The participant P.G. was spending a significant proportion of time engaged in ritualistic behaviour within the confines of the toilets at this time. The coding system utilised within the observation schedule necessitated a *self-intimate* coding and prohibited further clarification.

Group 2.3: Participant J.G.

CATEG-ORY	DATA POINT 1		DATA POINT 2		DATA POINT 3		DATA POINT 4		DATA POINT 5		DATA POINT 6	
	n	%	n	%	n	%	n	%	n	%	n	%
Self-Neutral	47.13	67.52	56	80	22.38	31.97	47.25	67.5	53.75	76.78	48.25	68.42
Self-Active	22.88	32.68	11.67	16.67	0.25	0.35	17.5	25	7.25	10.35	21	30
Person	0	0	2.33	3.32	5.75	8.21	4.25	6.07	8.5	12.14	0.75	1.07
Object	0	0	0	0	8	11.42	0.88	1.25	0.5	0.71	0	0
Person-Object	0	0	0	0	0.38	0.5	0	0	0	0	0	0
Self-Intimate	0	0	0	0	0	0	0	0	0	0	0	0
Out of View	0	0	0	0	0.12	0.17	0.12	0.17	0	0.17	0	0

Table E1.15: Assessment Data for Participant J.G. in Therapy Group 2.3

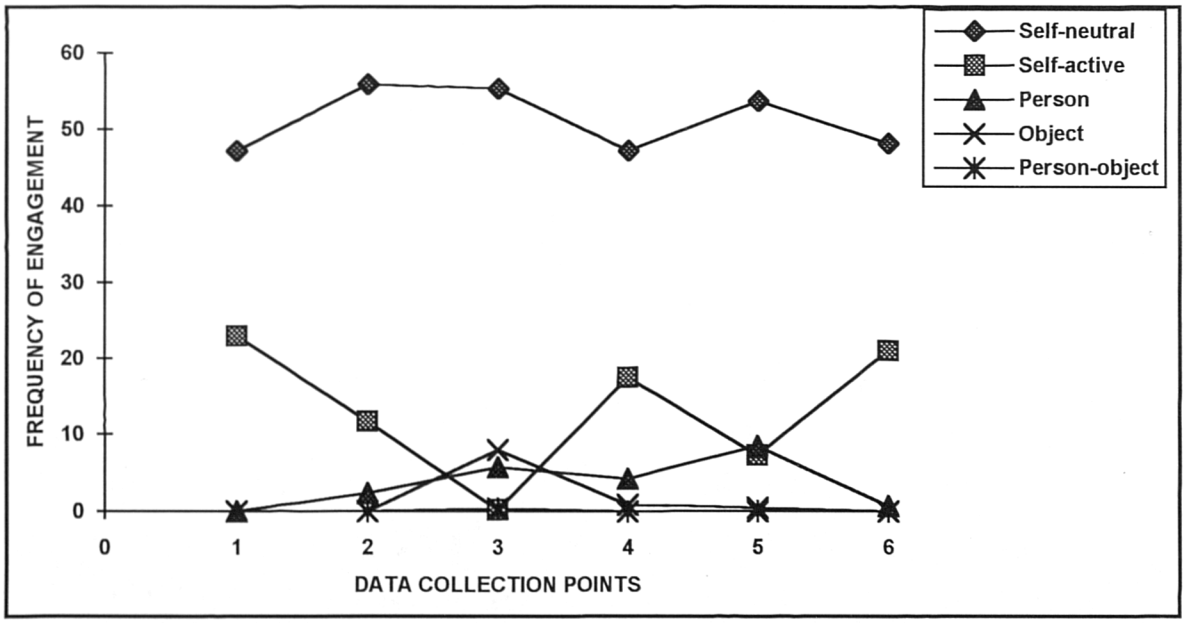

Figure E1.15: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant J.G. (Therapy Group 2.3)

J.G. of 2.3: J.G. was female. She was reported as having Rett's syndrome. J.G. had a kyphoscoliosis, used a wheelchair and was dependent on the support of significant others for her mobility needs. At baseline (1), J.G. displayed a high level *of self-neutral* behaviour (approximately two thirds of total time) and a moderate level of *self-active* behaviour (about one third of total time). After the first phase of **A.P.** therapy (2), a decline in *self-active* was observed concurrent with a rise in *self-neutral*. *Person* engagement also started to emerge at this data point. However *self-active* was not maintained at this reduced level after the second phase of **A.P.**, indeed it rose to its former level after the first **A.P.** phase at (2). This may have been influenced by the type of activities and stimuli utilised in the **A.P.** as opposed to the **I.S.E.**, the former requiring greater skills of manipulation without the immediacy of tactile feedback and symbolic understanding of the function of objects. This would made a significant difference to the participant J.G.'s skill set. The completion of the first phase of **I.S.E.** therapy (3) revealed the continued decline of *self-active* to apparent non-existence. S*elf-neutral* remained virtually unchanged. *Person* engagement continued to rise with a more extensive increase in *object* engagement. The second phase of **A.P.** therapy (4) effected a rise in *self-active* to just above its former level at point (2) and *object* engagement reverted to its original status. *Person* engagement was maintained just below its previous level at (3). The first follow up point (5), showed the decline of *self-active* behaviour just before its final rise at point (6). This was just below its original baseline level (1). This was concurrent with a small rise in *self-neutral* and *person* at point (5) and their subsequent decline at the final follow up point (6).

Group 2.3: Participant P.O.

CATEG-ORY	DATA POINT 1		DATA POINT 2		DATA POINT 3		DATA POINT 4		DATA POINT 5		DATA POINT 6	
	n	%	n	%	n	%	n	%	n	%	n	%
Self-Neutral	34	48.57	57.88	82.68	45.25	60.35	52.25	74.64				
Self-Active	20.31	29.01	0	0	0	0	0.13	0.18				
Person	3.81	5.4	3.38	4.82	19.13	27.32	17.38	24.82				
Object	2.38	3.4	5	7.14	5.5	7.85	0.25	0.35				
Person-Object	0	0	0.25	0.35	0.13	0.18	0	0				
Self-Intimate	8	11.42	0	0	0	0	0	0				
Out of View	1.5	2.14	3.5	5	0	0	0	0				

Table E1.16: Assessment Data for Participant P.O. in Therapy Group 2.3

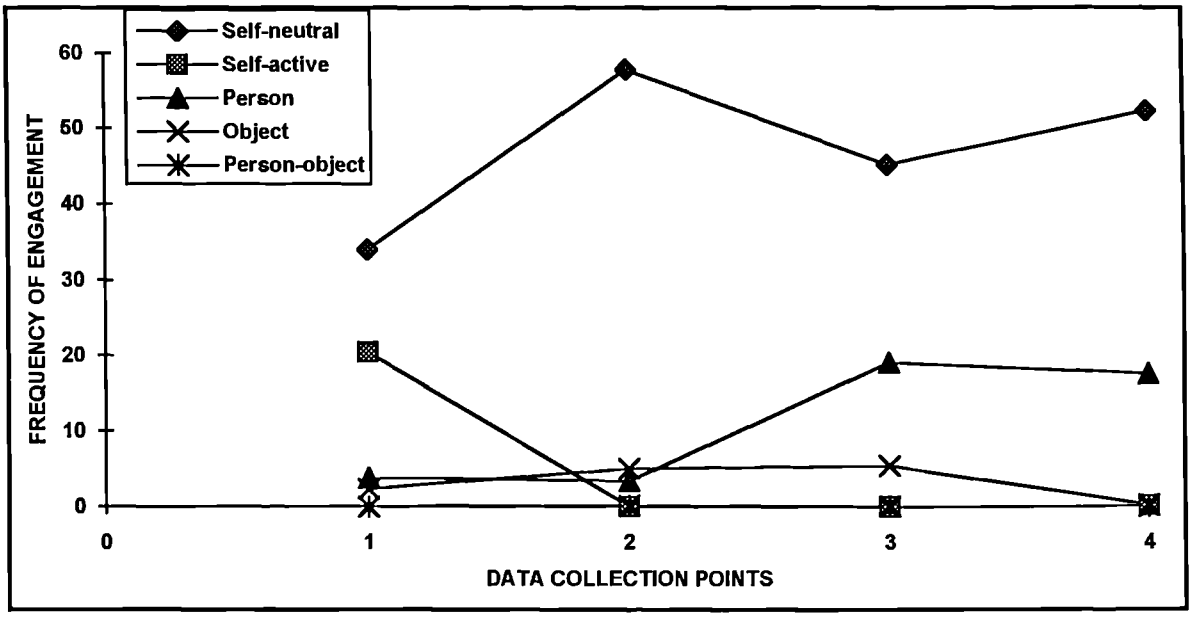

Figure E1.16: Graph to Show Changes in Engagement Levels Over Assessment Points for Participant P.O. (Therapy Group 2.3)

P.O. of 2.3: P.O. was male. He was awaiting audiological examination by electro-physiological means, although no sensory or other impairments had been diagnosed to date. At baseline (1), P.O. displayed a high level *of self-neutral* behaviour (approximately half of total time) and a moderate level of *self-active* behaviour (about one third of total time). After the first phase of **A.P.** therapy (2), a sharp decline in *self-active* was observed concurrent with a rise in *self-neutral. Person* engagement maintained a plateau with a small rise in *person* engagement occurring. The completion of the first phase of **I.S.E.** therapy (3) saw the stability of the reduced level of *self-active.* In fact, this continued at the remaining assessment (4). S*elf-neutral* reduced slightly and *object* engagement maintained its virtual stability. *Person* engagement, however, made the largest gain which reduced only slightly after the second phase of **I.S.E.** therapy at point (4). No follow up assessments were completed on this participant due to his long-term absence from the Day Centre due to a leg injury.

2. SUMMARY OF I.S.E. THERAPY DECISIONS

A summary of the decisions made for all participants prior to entry to the **I.S.E.** intervention phase is provided here. Tables are provided to summarise the key issues for individuals within their therapy groups, according to the five main areas within the **'Decision-Making Schedule'**. This is followed by a textual account to describe the variations which existed between individuals, and between the phases of **I.S.E.** therapy for Experimental Group 1, which received two episodes of **I.S.E.** intervention.

In order to create the appropriate *Individualised Sensory Environment* for each participant and to meet their unique needs, a number of decisions were made regarding the content of the therapy programme via a decision-making schedule. Its purpose was to ascertain the ideal conditions for the potential optimal response repertoire of each participant. Individual differences were observed between participants, and for the some participants in experimental group 1 *(groups 1.1 and 1.2)* between the first and second phases of therapy. Where gains were observed in the second phase over the first phase, participant responses were said to be wider ranging and more complex or more sophisticated than before.

The **'Decision-Making Schedule' (Appendix C4)** was carried out with each participant in order that a suitable, individual programme could be drawn up. Decisions were centred around five main areas considered to be crucial to the therapy process. These have been outlined previously in **Chapter 5** where the development of instrumentation has been dealt with. Briefly the decisions made for each participant were:

(a) The Response Repertoire: the interactive strengths in response to the various forms of sensory stimulation were noted and represented the expected responses during therapy;

(b) Definition of Therapist's Role: the most frequently used support cues were observed and recorded thus defining the help required by the participant. Further definition of the social interaction response level of the individual was made during the actual therapy phase;

(c) **Group Dynamics:** an initial decision was made regarding the ability of the participant to relate to another person as in demonstrating event knowledge, which was further defined during the actual therapy phase in terms of orientation to staff and peers;

(d) **Environment:** although the environment was not a specifically focused decision at this stage of the schedule, observations were made by the therapist regarding the space requirements and furnishings to support the physical needs of the participant. This was done in communication with a Physiotherapist where appropriate;

(e) **Form of Sensory Stimulation or Specification of Activities:** forms of sensation were included in the subsequent programme based on the participant's purposeful and positive responses to the item's feedback features. Those items where the participant had demonstrated rejection/refusal were also identified for exclusion. Those considered to be risky, i.e. the participant attempted to consume the item, were noted and either excluded or else included under a responsive management strategy. Other decisions were made regarding sensation during the actual therapy phase such as, presentation of choice, opportunity for joint attention and turn-taking, and any specific preferences to further define the form of tactile contact in person engagement.

Having completed a **Decision-Making Schedule**, information was transferred to a programme sheet as shown in **Appendix C5**.

GROUP 1.1	First I.S.E. Phase				Second I.S.E. Phase			
Response Repertoire	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**
Appropriate word(s)								
Appropriate sign(s)	YES		YES		YES	YES	YES	
Points								
Reaches	YES	YES	YES	YES	YES	YES	YES	YES
Vocalises	YES	YES	YES		YES	YES	YES	
Claps hands								
Relates to self	YES	YES	YES		YES	YES	YES	
Relates to other person	YES	YES	YES	YES	YES	YES	YES	YES
Withdraws								
Pushes away								
Consumes								

Table E2.1: Summary of Response Repertoire for Person Engagement (a) for Group 1.1

This first group included two participants who demonstrated the ability at baseline to produce an appropriate sign for the recurrence of the sensory stimulation, i.e. 'more', which extended to three participants at the entry point for the second phase of **I.S.E.** intervention. Other responses recorded in the first phase were reproduced in the second phase.

	First I.S.E. Phase				Second I.S.E. Phase			
Response Repertoire	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**
Touches	YES	YES	YES	YES	YES	YES	YES	YES
Picks up	YES	YES	YES	YES	YES	YES	YES	YES
Handles	YES	YES	YES	YES	YES	YES	YES	YES
Shakes/waves					YES	YES		
Pats/bangs	YES	YES			YES	YES	YES	
Pushes/pulls						YES		
Scoops/fills	YES	YES	YES	YES	YES	YES	YES	YES
Pours	YES	YES	YES	YES	YES	YES	YES	YES
Relates two		YES	YES	YES	YES	YES	YES	YES
Vocalises	YES	YES	YES		YES	YES	YES	
Claps hands	YES							
Relates to self	YES	YES	YES		YES	YES	YES	
Relates to other person	YES	YES			YES	YES	YES	YES
Withdraws				Tactile*(+wet)*				Tactile*(+wet)*
Pushes away								
Consumes								

Table E2.2: Summary of Response Repertoire for Object Engagement (a) for Group 1.1

A variety of responses to objects was recorded for the members of this group. Gains in the second phase were shown in the following response items. The number in brackets refers to the number of participants: Shakes/waves (2); Pats/bangs (1); Pushes/pulls (1); Relates 2 items (1); Relates to other person (2). Only one participant emitted negative responses in the form of body withdrawal, the feedback feature of the item was identified as *Tactile (+ wet)*. This knowledge was recognised within the programme structure for the individual and omitted as defined in **Table E2.7**. The participant's aversive response to this item was maintained in the second phase also.

	First I.S.E. Phase				Second I.S.E. Phase			
Person: presentation	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**
Show item	YES	YES	YES	YES	YES	YES	YES	YES
Demonstrate item	YES	YES	YES	YES	YES	YES	YES	YES
Offer item								
Physical prompt								
Person: recurrence								
Verbal only			YES				YES	
Verbal and sign	YES	YES	YES		YES	YES	YES	YES
Verbal and offer	YES	YES		YES	YES	YES		YES
Physical prompt				YES				
Object								
Present item	YES	YES	YES	YES	YES	YES	YES	YES
Demonstrate item	YES	YES	YES	YES	YES	YES	YES	YES
Physical prompt								

Table E2.3: Summary of Support Cues for Definition of Therapist's Role (b) for Group 1.1

Each participant within this group was able to respond to the two most complex cues (or the ones which required the more complex response from the individual) for both *Person* and *Object* presentation in each phase of **I.S.E.** Therapy. For the recurrence of *Person Engagement* only one participant was able to respond to the two most complex cues. The following positive changes were recorded in the second phase, where the less complex cue of a *physical prompt* was no longer used by the participant, and was replaced by *verbal and sign*.

	First I.S.E. Phase				Second I.S.E. Phase			
Person Engagement	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**
Relates to other person	YES	YES	YES	YES	YES	YES	YES	YES
Object Engagement								
Relates to other person	YES	YES			YES	YES	YES	YES

Table E2.4: Summary of Group Dynamics Regarding Staff and Peer Orientation (c) for Group 1.1

In *person engagement* each participant demonstrated the ability to relate an item to 'other person', and this was replicated in the second phase. In terms of the dynamics of the group, each participant was therefore situated with at least one other participant in group person activities to provide the opportunity for *relating to other person*. In *object engagement*, two participants were able to relate an item to *other person* in the first phase, and four participants in the second phase. This may be said to be representative of emerging *person-object engagement*, or more specifically the establishment of *event knowledge*.

	First I.S.E. Phase				Second I.S.E. Phase			
Environment	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**
Space Requirements	Support to move in space: spastic diplegia				Support to move in space: spastic diplegia			
Furnishings								

Table E2.5: Summary of Environment (d) for Group 1.1

One participant required support in terms of moving in space due to a spastic diplegia. Physical guidance at the elbow was provided.

	First I.S.E. Phase				Second I.S.E. Phase			
Items and Feedback Features	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**	**Participant: D.B.**	**Participant: J.C.**	**Participant: T.M.**	**Participant: R.A.**
1. Indirect non touch	YES	YES	YES	YES	YES	YES	YES	YES
2. Indirect touch *(-sound)*	YES	YES	YES	YES	YES	YES	YES	YES
3. Indirect touch *(+sound)*	YES	YES	YES	YES	YES	YES	YES	YES
4. Direct touch*(+ dry)*	YES	YES	YES	YES	YES	YES	YES	YES
5. Direct touch*(- dry)*	YES	YES	YES	YES	YES	YES	YES	YES
6. Direct touch*(-/+ dry)*	YES	YES	YES	YES	YES	YES	YES	YES
7. Direct vibro touch *(-dry/+ sound)*	YES	YES	YES	YES	YES	YES	YES	YES
8. Vestibular: angular *(+ rate/+direction)*	YES	YES	YES	YES	YES	YES	YES	YES
9. Vestibular: linear *(- rate/ - direction)*	YES	YES	YES	YES	YES	YES	YES	YES
10. Withdraws								
11. Pushes away								
12. Consumes								

Table E2.6: Summary of Form of Sensory Stimulation or Specification of Activities (e) - Person Engagement for Group 1.1

This group responded positively to all the sensory contacts and their feedback features for person activities.

Items and Feedback Features	First I.S.E. Phase				Second I.S.E. Phase			
	Participant: D.B.	Participant: J.C.	Participant: T.M.	Participant: R.A.	Participant: D.B.	Participant: J.C.	Participant: T.M.	Participant: R.A.
1. Tactile *(- wet)*	YES	YES	YES	YES	YES	YES	YES	YES
2. Tactile *(+ wet)*	YES	YES	YES		YES	YES	YES	
3. Vibro-tactile*(- wet;+ sound)*	YES	YES	YES	YES	YES	YES	YES	YES
4. Sensory Tray: granular *(-wet)*	YES	YES	YES	YES	YES	YES	YES	YES
5. Sensory Tray: objects x 1	YES	YES	YES	YES	YES	YES	YES	YES
6. Sensory Tray: objects x 2		YES	YES	YES	YES	YES	YES	YES
7. Sensory Tray: objects x 3		YES	YES	YES	YES	YES	YES	YES
8. Sensory Tray: liquid *(+ wet)*	YES	YES	YES	YES	YES	YES	YES	YES
9. Sensory Tray: objects x 1	YES	YES	YES	YES	YES	YES	YES	YES
10. Sensory Tray: objects x 2		YES	YES	YES	YES	YES	YES	YES
11. Sensory Tray: objects x 3		YES	YES	YES	YES	YES	YES	YES
12. Withdraws				2				2
13. Pushes away								
14. Consumes								

Table E2.7: Summary of Form of Sensory Stimulation or Specification of Activities (e) - Object Engagement for Group 1.1

One participant (R.A.) showed an aversive reaction to no.2. *Tactile (+ wet)* by withdrawing physically from the appropriate item. This was apparent in both phases of the therapy. The participant D.B. did not demonstrate an ability to relate 2-3 items in the *sensory tray* for entry to the first phase of therapy, but showed gains in this area in the second phase.

GROUP 1.2	First I.S.E. Phase			Second I.S.E. Phase		
Response Repertoire	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**
Appropriate word(s)						
Appropriate sign(s)			YES		YES	YES
Points						
Reaches	YES	YES	YES	YES	YES	YES
Vocalises	YES	YES	YES	YES	YES	YES
Claps hands		YES				
Relates to self		YES	YES		YES	YES
Relates to other person	YES		YES	YES	YES	YES
Withdraws	Indirect touch *(+sound)*; direct vibro touch *(-dry/+sound)*; vestibular *(linear & angular).*		Vestibular *(linear & angular).*			Vestibular *(linear and angular)*
Pushes away			Indirect non touch.			
Consumes		Direct touch *(- dry).*			Direct touch *(- dry).*	

Table E2.8: Summary of Response Repertoire for Person Engagement (a) for Group 1.2

This group demonstrated a more restricted range of responses than the previous one. In the first phase, only one out of the three was able to produce a sign for a recurrence of the sensory stimulation, i.e. 'more', although this extended to two participants at the entry point for the second **I.S.E.** intervention. Gains made over the two phases of **I.S.E.** intervention were: appropriate sign(s) (1); relates to other person (1). The response *'claps hands'* emitted by the participant P.R. for the first phase was not present in the second schedule. This may be because the behaviour had been replaced by a more sophisticated approximation of the sign for *'more'*. Aversive responses to certain items and their feedback features were made: V.K. withdrew; G.C. pushed the item away. The differing responses of the two participants were probably a reflection of their varying motor skills, in that V.K. found spontaneous execution of movement difficult due to hypotonia.

	First I.S.E. Phase			Second I.S.E. Phase		
Response Repertoire	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**
Touches	YES	YES	YES	YES	YES	YES
Picks up		YES	YES		YES	YES
Handles		YES	YES		YES	YES
Shakes/waves			YES			YES
Pats/bangs			YES		YES	YES
Pushes/pulls						
Scoops/fills		YES	YES		YES	
Pours						
Relates two						
Vocalises	YES		YES	YES	YES	YES
Claps hands						
Relates to self		YES			YES	
Relates to other person			YES		YES	YES
Withdraws	Vibro-tactile *(-wet; + sound)*.					
Pushes away			Sensory Tray: granular *(- wet)*.			
Consumes		Tactile *(+ wet)*; Sensory Tray *(+ wet; - wet)*.			Tactile *(+ wet)*; Sensory Tray *(+ wet; - wet)*.	

Table E2.9: Summary of Response Repertoire for Object Engagement (a) for Group 1.2

Again this group showed a narrower range of responses in *object* engagement, than Group 1.1. Some gains were made at the entry point to the second **I.S.E.** phase, although not for the participant V.K. Gains made were: pats/bangs (1); scoops/fills (1); vocalises (1); relates to other person (1). Similarly to *person* engagement, aversive responses were demonstrated in the same form: V.K. withdrew; G.C. pushed the item away. The feedback features were the same for the participant V.K.: vibration *(- wet; + sound)*. Neither participant's aversive responses to the items were maintained in the second phase.

First I.S.E. Phase				Second I.S.E. Phase		
Person: presentation	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**
Show item		YES	YES		YES	YES
Demonstrate item		YES	YES		YES	YES
Offer item	YES			YES		
Physical prompt	YES			YES		
Person: recurrence						
Verbal only		YES			YES	YES
Verbal and sign		YES	YES		YES	YES
Verbal and offer	YES		YES	YES		
Verbal and physical prompt	YES			YES		
Object						
Present item		YES	YES		YES	YES
Demonstrate item	YES	YES	YES	YES	YES	YES
Physical prompt	YES			YES		

Table E2.10: Summary of Support Cues for Definition of Therapist's Role (b) for Group 1.1

Two participants within this group were able to respond to the two most complex for both *person* and *object* presentation in each phase of **I.S.E.** Therapy. For the recurrence of *person* engagement, only one participant was able to respond to the two most complex cues at the first phase. The participant V.K. utilised the two least complex cues throughout the schedule. This may have been effected by the hypotonia already mentioned. In the second phase, G.C. demonstrated the ability to respond to the more sophisticated cue: *Verbal only* for 'person recurrence'.

	First I.S.E. Phase			Second I.S.E. Phase		
Person Engagement	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**
Relates to other person	YES			YES	YES	YES
Object Engagement						
Relates to other person			YES		YES	YES

Table E2.11: Summary of Group Dynamics Regarding Staff and Peer Orientation (c) for Group 1.2

In *person* engagement, the participant V.K. demonstrated the ability to relate to 'other person' in the first phase. This was replicated in the second phase and further shown by the other two participants. In terms of the dynamics of the group, the participants were situated such that other members were clearly visible for onlooker behaviour or relating to other person as in the case of V.K. In *object* engagement, the participant G.C. was able to relate an item to 'other person' in the first phase, and similarly P.R. in the second phase. Thus, for *object* activities both participants were situated at either end of the same table to provide for the opportunity to relate object to 'other person'.

First I.S.E. Phase				Second I.S.E. Phase		
Environment	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**
Space Requirements	Support to move in space: hypotonia.	One to one direction to prevent wandering.	Defined space in corner of room, facing the room.	Support to move in space: hypotonia.	One to one direction to prevent wandering.	Defined space in corner of room, facing the room.
Furnishings	For person contact: table chair with high back and arms for support; for object contact: prone over soft wedge.		Soft mattress against wall to protect from head banging.	For person contact: table chair with high back and arms for support; for object contact: prone over soft wedge.		Soft mattress against wall to protect from head banging.

Table E2.4: Summary of Environment (d) for Group 1.2

The participant V.K. required support to move in space due to hypotonia and an inability to initiate and maintain voluntary movement. This was provided in the form of physical guidance as needed. In order to provide a position for optimal responding, and on the recommendation of the physiotherapist, the participant V.K. was provided with a 'table' chair with back support and arm rests for *person* contact activities, and a soft wedge to support a prone position for *object* engagement. The participant P.R. was provided with one to one attention by the room manager or the specialist helper to monitor wandering behaviour and consumption of non-edibles. G.C. was provided with a defined space in a corner of the room, outward facing in support of her demonstrated preference. A soft mattress was placed against the wall to protect G.C. from tissue damage as a result of head banging.

	First I.S.E. Phase			Second I.S.E. Phase		
Items and Feedback Features	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**	**Participant: V.K.**	**Participant: P.R.**	**Participant: G.C.**
1. Indirect non touch	YES	YES		YES	YES	YES
2. Indirect touch *(-sound)*	YES	YES	YES	YES	YES	YES
3. Indirect touch *(+sound)*		YES	YES	YES	YES	YES
4. Direct touch *(+ dry)*	YES	YES	YES	YES	YES	YES
5. Direct touch *(- dry)*	YES	YES	YES	YES	YES	YES
Direct touch *(-/+ dry)*	YES	YES	YES	YES	YES	YES
7. Direct vibro touch *(- dry/+ sound)*		YES	YES	YES	YES	YES
8. Vestibular: angular *(+ rate/+direction)*		YES		YES	YES	
9. Vestibular: linear *(- rate/ - direction)*		YES		YES	YES	
10. Withdraws	3, 7, 8 & 9		8 & 9			8 & 9
11. Pushes away			1			
12. Consumes		5			5	

Figure E2.12: Summary of Form of Sensory Stimulation or Specification of Activities (e) - Person Engagement for Group 1.2

In the first phase, the participant V.K. displayed withdrawal behaviour in response to the massager brush *(3. + sound)*; the body vibro-massager *(- dry; + sound)*; and the two forms of vestibular stimulation. This had diminished at the point of entry to the second phase. In both phases of therapy, the participant G.C. showed an aversive response to both forms of vestibular stimulation by physical withdrawal. The participant P.R. attempted to *'consume'* the foam *(5. - dry)*. Rather than omit this item from a subsequent programme, an appropriate strategy of one to one monitoring was introduced to minimise risk. The therapist was required to exclaim non verbal dismay, i.e. *'ugh!'* supported by the Makaton sign for *'no'*, such that attention was distracted prior to consumption of item.

Items and Feedback Features	First I.S.E. Phase			Second I.S.E. Phase		
	Participant: V.K.	Participant: P.R.	Participant: G.C.	Participant: V.K.	Participant: P.R.	Participant: G.C.
1. Tactile *(- wet)*	YES	YES	YES	YES	YES	YES
2. Tactile *(+ wet)*	YES	YES	YES	YES	YES	YES
3. Vibro -tactile *(-wet; +sound)*		YES	YES	YES	YES	YES
4. Sensory Tray: granular *(- wet)*	YES	YES		YES	YES	YES
5. Sensory Tray: objects x 1		YES			YES	YES
Sensory Tray: objects x 2						
7. Sensory Tray: objects x 3						
8. Sensory Tray: liquid *(+ wet)*	YES	YES	YES	YES	YES	YES
9. Sensory Tray: objects x 1		YES	YES		YES	YES
10. Sensory Tray: objects x 2						
11. Sensory Tray: objects x 3						
12. Withdraws	3					
13. Pushes away			4			
14. Consumes		2, 4 & 8			2, 4 & 8	

Table E2.13: Summary of Form of Sensory Stimulation or Specification of Activities (e) - Object Engagement for Group 1.2

The participant V.K. showed an aversive reaction to no. 3; *Vibro-tactile (-wet; +sound)* by withdrawing from the item. This was not maintained in the second phase of **I.S.E.** therapy. The participant G.C. pushed away item 4. *Sensory tray (granular)* in the first phase but not the second. P.R. attempted to consume items 2, 4 and 8. An identical strategy to the one previously mentioned under 'Person Engagement' was used.

GROUP 2.1	First I.S.E. Phase (2)			
Response Repertoire	**Participant: M.W.**	**Participant: G.B.**	**Participant: L.C.**	**Participant: S.M.**
Appropriate word(s)				
Appropriate sign(s)		YES		
Points				
Reaches	YES	YES	YES	YES
Vocalises	YES	YES	YES	
Claps hands				
Relates to self	YES		YES	
Relates to other person	YES	YES		YES
Withdraws	Vestibular: *(linear & angular).*	Direct touch *(+dry; -dry; -/-dry);* Vestibular: *(linear & angular).*	Vestibular: *(linear);* direct vibro-touch *(+dry; +sound).*	
Pushes away				
Consumes				

Table E2.15: Summary of Response Repertoire for Person Engagement (a) for Group 2.1

This group comprised four participants. Only one participant demonstrated signing behaviour, and one participant did not produce any vocalisations. Two participants were able to relate items to 'self', and three to 'other person'. Aversive reactions were shown in the form of withdrawal for three participants and these items and their feedback features were excluded from the subsequent programme. One participant in particular seemed to withdraw from items which left a deposit on the hands, i.e. direct touch items of talc, cream, etc. This recurred in his aversive responses to certain object activities.

First I.S.E. Phase (2)				
Response Repertoire	**Participant: M.W.**	**Participant: G.B.**	**Participant: L.C.**	**Participant: S.M.**
Touches	YES	YES	YES	YES
Picks up	YES	YES	YES	YES
Handles	YES	YES	YES	YES
Shakes/waves			YES	
Pats/bangs				YES
Pushes/pulls	YES	YES		
Scoops/fills				
Pours				
Relates two				
Vocalises	YES	YES		
Claps hands				
Relates to self				
Relates to other person	YES	YES		YES
Withdraws		Tactile *(wet);* Sensory Tray *(+wet; -wet).*	Tactile *(wet);* Sensory Tray *(+wet).*	
Pushes away				
Consumes				

Table E2.16: Summary of Response Repertoire for Object Engagement (a) for Group 2.1

This group also showed a narrower range of responses than Group 1.1. None of the participants demonstrated functional use of the containers in the sensory tray activities or related two items. There was no evidence of relating item to 'self' although three of the participants related item to 'other person', demonstrating event knowledge. Two of the participants withdrew from the foam *(tactile: +wet)*, and variously from the sensory tray activities.

First I.S.E. Phase (2)				
Person: presentation	**Participant: M.W.**	**Participant: G.B.**	**Participant: L.C.**	**Participant: S.M.**
Show item	YES	YES		
Demonstrate item	YES	YES	YES	YES
Offer item			YES	YES
Physical prompt				
Person: recurrence				
Verbal only		YES		
Verbal and sign		YES	YES	
Verbal and offer	YES		YES	YES
Verbal and physical prompt	YES			YES
Object				
Present item	YES	YES		
Demonstrate item	YES	YES	YES	YES
Physical prompt			YES	YES

Table E2.17: Summary of Support Cues for Definition of Therapist's Role (b) for Group 2.1

Two participants within this group was able to respond to the two most complex presentation cues for both *person* and *object* activities. The other two participants required *demonstrate item/offer* item for person engagement, and *demonstrate item/physical prompt* for object presentation. For the recurrence of *person* engagement only the participant G.B. was able to respond to the two most complex cues. The participant L.C. responded to the next pair of cues *verbal and sign/verbal and offer,* whilst the remaining two participants utilised the two least complex cues.

First I.S.E. Phase (2)				
Person Engagement	**Participant: M.W.**	**Participant: G.B.**	**Participant: L.C.**	**Participant: S.M.**
Relates to other person	YES	YES		YES
Object Engagement				
Relates to other person	YES	YES		YES

Table E2.18: Summary of Group Dynamics - Staff & Peer Orientation (c) for Group 2.1

In *person* engagement the participants M.W., G.B. and S.M. demonstrated the ability to relate to 'other person'. For the dynamics of the group, these participants were situated with another member for the opportunity to demonstrate this behaviour. Similarly, these three participants were able to relate an object to 'other person' and were suitably situated in shared space for *object* engagement activities.

First I.S.E. Phase (2)				
Environment	**Participant: M.W.**	**Participant: G.B.**	**Participant: L.C.**	**Participant: S.M.**
Space Requirements			Preference for corner of room, separate from others.	
Furnishings			Preference for armchair.	

Table E2.19: Summary of Environment (d) for Group 2.1

The participant L.C. was provided with an arm chair placed in a corner of the room, apart from the others, in support of her demonstrated preference.

First I.S.E. Phase (2)				
Items and Feedback Features	**Participant: M.W.**	**Participant: G.B.**	**Participant: L.C.**	**Participant: S.M.**
1. Indirect non touch	YES	YES	YES	YES
2. Indirect touch *(-sound)*	YES	YES	YES	YES
3. Indirect touch *(+sound)*	YES	YES	YES	YES
4. Direct touch *(+ dry)*	YES		YES	YES
5. Direct touch *(- dry)*	YES		YES	YES
6. Direct touch *(-/+ dry)*	YES		YES	YES
7. Direct vibro touch *(-dry/+ sound)*	YES	YES		YES
8. Vestibular: angular *(+ rate/+direction)*	YES		YES	YES
9. Vestibular: linear *(- rate/ - direction)*	YES			YES
10. Withdraws		4, 5, 6, 8 & 9	9	
11. Pushes away			7	
12. Consumes				

Table E2.20: Summary of Form of Sensory Stimulation or Specification of Activities (e) - Person Engagement for Group 2

The participant G.B. displayed withdrawal behaviour in response to a number of items: all the direct touch items (i.e. ones which left a deposit on the skin) and both vestibular forms of stimulation. The participant L.C. pushed away item 7. (Direct vibro-touch *-dry/+sound*) and withdrew from the linear form of vestibular stimulation.

First I.S.E. Phase (2)				
Items and Feedback Features	**Participant: M.W.**	**Participant: G.B.**	**Participant: L.C.**	**Participant: S.M.**
1. Tactile *(- wet)*	YES	YES	YES	YES
2. Tactile *(+ wet)*	YES			YES
3. Vibro-tactile *(- wet; + sound)*	YES	YES	YES	YES
4. Sensory Tray: granular *(-wet)*	YES		YES	YES
5. Sensory Tray: objects x 1			YES	
6. Sensory Tray: objects x 2				
7. Sensory Tray: objects x 3				
8. Sensory Tray: liquid *(+ wet)*	YES			YES
9. Sensory Tray: objects x 1				YES
10. Sensory Tray: objects x 2				
11. Sensory Tray: objects x 3				
12. Withdraws		2, 4 & 8	2 & 8	
13. Pushes away				
14. Consumes				

Table E2.21: Summary of Form of Sensory Stimulation or Specification of Activities (e) - Object Engagement for Group 2.1

Similarly the participant G.B. showed an aversive reaction to items which left a deposit on the hands (foam , granular and liquid contents of the sensory tray). The participant L.C. withdrew from the foam and the liquid sensory tray.

GROUP 2.2	First I.S.E. Phase (2)		
Response Repertoire	**Participant: T.T.**	**Participant: A.B.**	**Participant: P.G.**
Appropriate word(s)		YES	YES
Appropriate sign(s)	YES	YES	YES
Points			
Reaches	YES	YES	YES
Vocalises	YES	YES	YES
Claps hands	YES		YES
Relates to self	YES	YES	YES
Relates to other person	YES	YES	YES
Withdraws			Indirect non touch.
Pushes away			
Consumes			

Table E2.22: Summary of Response Repertoire for Person Engagement (a) for Group 2.2

This group comprised three participants. Two participants demonstrated the use of appropriate words, i.e. *'more'*, and all three participants displayed *signing* behaviour. The whole group was able to relate items to 'self', and to 'other person'. Aversive reactions were shown in the form of withdrawal by the participant P.G. for the indirect non touch item *(i.e. fan).*

First I.S.E. Phase (2)			
Response Repertoire	**Participant: T.T.**	**Participant: A.B.**	**Participant: P.G.**
Touches	YES	YES	YES
Picks up	YES	YES	YES
Handles	YES	YES	YES
Shakes/waves			
Pats/bangs			
Pushes/pulls			
Scoops/fills	YES	YES	YES
Pours	YES	YES	YES
Relates two	YES	YES	YES
Vocalises	YES	YES	
Claps hands	YES		
Relates to self	YES		
Relates to other person	YES	YES	YES
Withdraws		Tactile (*+wet).*	
Pushes away			
Consumes			

Table E2.23: Summary of Response Repertoire for Object Engagement (a) for Group 2.2

Response Repertoire: This group showed a fairly wide range of responses including functional use of the presented items. Only the participant T.T. demonstrated responses relating item to 'self', although all the participants related item to 'other person', thus showing event knowledge. This was probably related to the emergent use of word and sign by the participants in this Group. The participant A.B. withdrew from the foam *(tactile: +wet)* and this was excluded from the subsequent individual programme.

First I.S.E. Phase (2)			
Person: presentation	**Participant: T.T.**	**Participant: A.B.**	**Participant: P.G.**
Show item	YES	YES	YES
Demonstrate item	YES	YES	YES
Offer item			
Physical prompt			
Person: recurrence			
Verbal only	YES		YES
Verbal and sign	YES	YES	YES
Verbal and offer		YES	
Verbal and physical prompt			
Object			
Present item	YES	YES	YES
Demonstrate item	YES	YES	YES
Physical prompt			

Table E2.24: Summary of Support Cues for Definition of Therapist's Role (b) for Group 2.2

All the participants within this group were able to respond to the two most complex presentation cues for both *person* and *object* activities. For the recurrence of *person* engagement, the participant A.B. required the next pair of cues: *verbal and sign/verbal and offer* even though she was found to use appropriate words herself. It is likely that this was due to differences between comprehension and expressive skills levels, i.e. A.B. was able to produce appropriate speech as a response but unable use it as the sole stimulus. Similarly the participant T.T., whilst able to produce a signed response to a *verbal only* stimulus, was unable to produce a verbal response.

First I.S.E. Phase (2)			
Person Engagement	**Participant: T.T.**	**Participant: A.B.**	**Participant: P.G.**
Relates to other person	YES	YES	YES
Object Engagement			
Relates to other person	YES	YES	YES

Table E2.25: Summary of Group Dynamics - Staff & Peer Orientation (c) for Group 2.2

In *person* engagement and *object* engagement, all the participants demonstrated the ability to relate to 'other person'. In terms of the dynamics of the group, these participants were situated together for the opportunity to demonstrate this behaviour.

First I.S.E. Phase (2)			
Environment	**Participant: T.T.**	**Participant: A.B.**	**Participant: P.G.**
Space Requirements			
Furnishings			

Table E2.26: Summary of Environment (d) for Group 2.2

No space requirements or adaptation to furnishings were specified.

First I.S.E. Phase (2)			
Items and Feedback Features	**Participant: T.T.**	**Participant: A.B.**	**Participant: P.G.**
1. Indirect non touch	YES	YES	
2. Indirect touch *(-sound)*	YES	YES	YES
3. Indirect touch *(+sound)*	YES	YES	YES
4. Direct touch *(+ dry)*	YES	YES	YES
5. Direct touch *(- dry)*	YES	YES	YES
6. Direct touch *(-/+ dry)*	YES	YES	YES
7. Direct vibro touch *(-dry/+ sound)*	YES	YES	YES
8. Vestibular: angular*(+rate/+direction)*	YES	YES	YES
9. Vestibular: linear*(- rate/ - direction)*	YES	YES	YES
10. Withdraws			
11. Pushes away			1
12. Consumes			

Table E2.27: Summary of Form of Sensory Stimulation or Specification of Activities (e) - Person Engagement for Group 2.2

Apart from the participant P.G. pushing away the indirect non touch item *(the fan)*, the other participants responded positively to all the items.

First I.S.E. Phase (2)			
Items and Feedback Features	**Participant: T.T.**	**Participant: A.B.**	**Participant: P.G.**
1. Tactile *(- wet)*	YES	YES	YES
2. Tactile *(+ wet)*	YES		YES
3. Vibro-tactile*(- wet; + sound)*	YES	YES	YES
4. Sensory Tray: granular *(-wet)*	YES	YES	YES
5. Sensory Tray: objects x 1	YES	YES	YES
6. Sensory Tray: objects x 2	YES	YES	YES
7. Sensory Tray: objects x 3	YES	YES	YES
8. Sensory Tray: liquid *(+ wet)*	YES	YES	YES
9. Sensory Tray: objects x 1	YES	YES	YES
10. Sensory Tray: objects x 2	YES	YES	YES
11. Sensory Tray: objects x 3	YES	YES	YES
12. Withdraws		2	
13. Pushes away			
14. Consumes			

Table E2.28: Summary of Form of Sensory Stimulation or Specification of Activities (e) - Object Engagement for Group 2.2/

The participant A.B. showed an aversive reaction to item (2), the foam, by withdrawing from it. Therefore tactile items in the no. 2 category with the feedback feature of *'+ wet'* were eliminated from her subsequent individual programme.

GROUP 2.3	First I.S.E. Phase (2)	
Response Repertoire	**Participant: J.G.**	**Participant: P.O.**
Appropriate word(s)		
Appropriate sign(s)		
Points		
Reaches	YES	YES
Vocalises		YES
Claps hands		
Relates to self		YES
Relates to other person	YES	YES
Withdraws		
Pushes away		
Consumes		

Table E2.29: Summary of Response Repertoire for Person Engagement (a) for Group 2.3

This group comprised two participants who demonstrated the use of reaching behaviour and relating to 'other person'. The participant P.O. was able to relate items to 'self' and also vocalised in response.

First I.S.E. Phase (2)		
Response Repertoire	**Participant: J.G.**	**Participant: P.O.**
Touches	YES	YES
Picks up	YES	YES
Handles	YES	YES
Shakes/waves		
Pats/bangs	YES	
Pushes/pulls		
Scoops/fills		
Pours		
Relates two		
Vocalises		YES
Claps hands		
Relates to self		YES
Relates to other person		YES
Withdraws		Sensory Tray: *(- wet)*
Pushes away		
Consumes		

Table E2.30: Response Repertoire for Object Engagement (a) for Group 2.3

Both participants displayed a more limited range of *object* responses than for the other groups. Object responses for both were limited to *touching, picking up* and *handling*. The participant J.G *patted/banged* objects and P.O. produced some *vocalisations*. Only the participant P.O. demonstrated responses relating item to 'self' and to 'other person', thus showing event knowledge. The participant P.O. withdrew from the sensory tray *(tactile: -wet)* and this was excluded from the subsequent individual programme.

First I.S.E. Phase (2)		
Person: presentation	**Participant: J.G.**	**Participant: P.O.**
Show item		
Demonstrate item		YES
Offer item	YES	YES
Physical prompt	YES	
Person: recurrence		
Verbal only		
Verbal and sign		
Verbal and offer	YES	YES
Verbal and physical prompt	YES	YES
Object		
Present item		YES
Demonstrate item	YES	YES
Physical prompt	YES	

Table E2.31: Summary of Support Cues for Definition of Therapist's Role (b) for Group 2.3

The participant P.O. was able to respond to slightly higher cues than J.G. for *person* and *object* presentation. J.G. required *'verbal with offer'* and *'verbal and physical prompt'*, or *'demonstrate'* and *'physical prompt'*. P.O. was able to respond to the two most complex cues for *object* engagement, but required the two least complex for recurrence of *person* engagement, and the middle two for person presentation.

First I.S.E. Phase (2)		
Person Engagement	**Participant: J.G.**	**Participant: P.O.**
Relates to other person	YES	YES
Object Engagement		
Relates to other person		YES

Table E2.32: Summary of Group Dynamics - Staff & Peer Orientation (c) for Group 2.3

In *person* engagement both participants demonstrated the ability to relate to 'other person' and were seen in a pair for this group of activities. Only the participant P.O. demonstrated *relates to other person* in *object* engagement and thus defined a role carrying out similar activity for the therapist, due to the restricted membership numbers in this particular group. Ideally this participant would have been placed with a peer who was also able to demonstrate event knowledge, thus providing the opportunity for its expression. The base group set up within the centre did not allow for the recommended alteration.

First I.S.E. Phase (2)		
Environment	**Participant: J.G.**	**Participant: P.O.**
Space Requirements	Dependent wheelchair user: requires support to move in space.	
Furnishings	Requires work table height for both person and object activities.	

Table E2.33: Summary of Environment (d) for Group 2.3

J.G. was a dependent wheelchair user and required support to move in space. The recommended engagement position for this participant was work table height for maximum visual field and optimal responding as specified by the physiotherapist.

First I.S.E. Phase (2)		
Items and Feedback Features	**Participant: J.G.**	**Participant: P.O.**
1. Indirect non touch	YES	YES
2. Indirect touch *(-sound)*	YES	YES
3. Indirect touch *(+sound)*	YES	YES
4. Direct touch *(+ dry)*	YES	YES
5. Direct touch *(- dry)*	YES	YES
6. Direct touch *(-/+ dry)*	YES	YES
7. Direct vibro touch *(-dry/+ sound)*	YES	YES
8. Vestibular: angular *(+ rate/+direction)*	YES	YES
9. Vestibular: linear *(- rate/ - direction)*	YES	YES
10. Withdraws		
11. Pushes away		
12. Consumes		

Table E2.34: Form of Sensory Stimulation or Specification of Activities (e) - Person Engagement for Group 2.3

Both participants gave positive responses to all the items in this section and their feedback features.

First I.S.E. Phase (2)		
Items and Feedback Features	**Participant: J.G.**	**Participant: P.O.**
1. Tactile *(- wet)*	YES	YES
2. Tactile *(+ wet)*	YES	YES
3. Vibro-tactile *(- wet; + sound)*	YES	YES
4. Sensory Tray: granular *(-wet)*	YES	
5. Sensory Tray: objects x 1		
6. Sensory Tray: objects x 2		
7. Sensory Tray: objects x 3		
8. Sensory Tray: liquid *(+ wet)*	YES	YES
9. Sensory Tray: objects x 1		
10. Sensory Tray: objects x 2		
11. Sensory Tray: objects x 3		
12. Withdraws		4
13. Pushes away		
14. Consumes		

Table E2.35: Summary of Form of Sensory Stimulation or Specification of Activities (e) - Object Engagement for Group 2.3

The participant P.O. showed an aversive reaction to item (4), the foam, by withdrawing from it. Therefore tactile items in the no. 4 category with the feedback feature of *'- wet'* were eliminated from his subsequent individual programme. Neither participant was able to incorporate objects in functional activity of the sensory trays *(items 5, 6 & 7, 9, 10 & 11).*

Summary of Decisions for Participant Entry to I.S.E. Intervention

The Decision-Making Schedule allowed for initial key decisions regarding a number of parameters in each participant's *'Individualised Sensory Environments'*. The decisions provided a framework for the structure of therapy, taking into account unique needs of participants, including target responses; support cues required; group dynamics in terms of staff and peer orientation; environmental specifications; and preferred sensations or activities. The data presented is largely descriptive and documents some of the changes that were observed between the two phases of **I.S.E.** therapy in Groups 1.1 and 1.2.

It is clear from this descriptive data that differences did exist amongst the groups for their initial phase of **I.S.E.** therapy. Some participants were demonstrably more able to respond to complex support cues *(groups 1.1; 2.2)* than others, who were more dependent on physical support *(groups 1.2; 2.3)*. This tended to correspond with the ranges of responding behaviour in the same groups. The group 2.1 demonstrated a mixed range of needs regarding support cues. Thus it is observed that the starting point of therapy varied amongst the participants in groups and between the groups.

The group 2.1 showed the most aversive responses to the items presented in the schedule, with one participant withdrawing from 5 out of 9 potential stimuli in *person* engagement and 3 out of a potential 5 items in *object* activity. This severely affected the range of sensations and activities that could be used with this participant. Furthermore, it raised the question as to whether sensory stimulation in the form of tactile and vestibular sensations was going to provide the appropriate motivating consequence for the participant.

Variations in participant mobility and adaptive behaviour influenced the environmental specifications and may also account for some of the differences in response repertoire and required support cues between participants. Groups 2.3 and 1.2 included participants *(J.G. and V.K.)* with restricted lower and upper limb mobility in terms of spontaneous execution of motor plans. Thus it may be no surprise that these individuals produced more limited response repertoires and needed the least complex support cues *(i.e. verbal and offer; verbal and physical prompt)*.

For the groups who experienced two phases of the **I.S.E.** therapy *(groups 1.1 and 1.2),* some gains were observed amongst the response repertoires; support cues; peer and staff orientation - particularly emerging event knowledge; and the forms of sensory stimulation or specification of activities. It is true to say that no regression was observed in any of these areas, only gains. Thus it seems that individuals in the second phase were able to emit responses, respond to cues, demonstrate orientations, and not exhibit denial of sensations, which were previously unseen in the initial phase. Familiarity with the schedule, stimulus-response opportunities provided in the previous phase of therapy sessions may have contributed to this overall progression in the defined areas of the schedule.

The Decision-Making Schedule has been used in this study to provide a standard structure to programme planning for *'Individualised Sensory Environments'.* It seems that such a format may be useful in subsequent programme adjustment, whereby the therapist is able to revisit original therapy plans for an individual by 're-making' the essential decisions and feeding these forward into the new therapy phase.

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