COGNITIVE MATURITY AND THE EXPERIENCE OF FEAR AND PAIN IN HOSPITAL

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Abstract—Children between 4 years 6 months and 13 years 5 months of age who had been admitted to the St Charles Hospital, London for tonsillectomies were interviewed prior to their operation. It was found that cognitive maturity is an important factor in determining how children understand their hospital experience and the way in which they conceive of strategies for coping with fear and pain. Furthermore, it is suggested that because the younger children lack the cognitive maturity to develop autonomous strategies, they might be less able than older children to accept medical intervention, even under the most favourable conditions of hospitalization.

INTRODUCTION

A considerable number of studies have been carried out by social scientists and medical doctors concerning the welfare of children in hospital [1]. From these studies have emerged several specific recommendations for pediatric care, such as providing play facilities [2], humanizing the hospital environment [3], informing children prior to the operation of the nature of the medical intervention [4] and encouraging parents to visit regularly or stay overnight in hospital [5]. Some of these recommendations were taken up previously by the British Government in the Platt Report [6] on the welfare of children in hospital and the extent to which these recommendations have been implemented was recently evaluated in a WHICH Campaign Report [7].

The common observation of these studies is that hospitalization is a potentially threatening experience which may disturb the child before, during and after the medical intervention. Visintainer and Wolfer have usefully summarized five different threatening aspects of the hospital experience: (1) the threat of physical harm inflicted during the operation, (2) separation from one's parents and other trusted people, (3) the threat of strange and unforeseeable experiences, (4) the uncertainty about 'acceptable' behaviour and (5) relative loss of control and personal autonomy [8].

The recommendations for pediatric care urged by researchers are based upon the underlying assumption that a beneficial hospital environment will alleviate the child's distress and thereby further the child's successful recovery.

The complexity of the above-mentioned causes of hospital related distress has created methodological problems in testing the specific beneficial effects of the recommendations for changes in pediatric care. Although the assumption is plausible that there is a connection between non-threatening hospitalization and a successful well-adjusted recovery, nevertheless the conditions under which such an effect may be realized have not yet been tested systematically in clinical experiments. There is, however, a growing body of experimental evidence in support of the recommendation that children be prepared psychologically prior to medical intervention. Studies have been carried out with respect to minor operations [9], major surgery [10] and chronic illness [11]. Typical of this research is the work of Visintainer and Wolfer who compared the adjustment of children from 3 to 12 years of age who had been hospitalized for tonsillectomies [12]. They found that the children who received each stressful procedure underwent a combination of systematic preparation, rehearsal and supportive care responded best to treatment. The children in the other three conditions, namely a single session of preparation conducted after admission, consistent supportive care given by the same nurse at stresspoints or normal contact with a nurse (control condition) displayed more upset behaviour and less cooperation than the children assigned to the first condition.

For the most part these studies have focused on the child's behavioural reactions to hospital related distress. Apart from Campbell and Clough very little information has been collected on the way in which children talk about their fears of hospitalization and the coping strategies which might alleviate their distress [13]. Moreover, such information has not been analysed in the light of the child's cognitive development. Recent research in developmental psychology has focused on the child's metacognitive thinking and has examined the way in which children monitor their perceptions and are able to use this information to anticipate their reactions [14]. This research would suggest that at some level of cognitive maturity the child in hospital is able to monitor actively his cognitions and make use of these cognitions in his strategies for coping with hospitalization. This metacognitive dimension of course, does not reveal how children in hospital would actually react in any given situation but it does indicate how they would anticipate their reactions. Furthermore it would suggest the level of cognitive maturity necessary for the child to make conscious use of the information provided in the psychological preparation. The purpose of the present study, therefore, is to examine the hospital experience from the child's point of view and to analyse these findings in the light of the child's cognitive development.

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METHOD

Setting

The St Charles Hospital in London, which provided the setting and subjects for this research, conforms to many of the recommendations of the Platt Report. Hence the children were interviewed in an environment which, according to current medical opinion, is thought to be particularly conducive in alleviating hospital related distress in the child. Unrestricted visits are allowed for parents as well as for friends and siblings of the sick child; and accommodation is available for parents who wish to stay overnight. Furthermore, teaching facilities and a playroom are provided and the children are allowed to bring their toys from home. The children wear their own clothes in the ward and change at nighttime into their own pyjamas. The doctors usually dress in everyday clothes and the nurses in flower patterned dresses. Only the student nurses and the cleaners appear in hospital uniform. These details are mentioned not with the view of demonstrating their possible beneficial effect upon the child's state of mind, but merely to describe the conditions under which the data were collected.

Subjects

Fifty-eight children were interviewed in the Peter Pan Ward of the St Charles Hospital. All the children, from the inner city catchment area of the hospital, had been admitted to hospital for an operation, usually a tonsillectomy or adenoidectomy. The age of the children in this sample ranged from 4 years 6 months to 13 years 5 months of whom there were 24 boys and 34 girls. The upper end of the age range was determined by the admission policy of the hospital. The lower end of the age range was determined by the method of data collection. It is only from 41 years of age that children are able to sustain an interview in a stressful situation for 15 min or more. The interviews were conducted in the playroom of the Peter Pan Ward after the time of registration, which was usually the afternoon prior to the operation. Parents were informed that they were welcome to come to the playroom to listen to their child's answers, but in most cases the child was happy to come on his or her own. The questions (see Table 1) were administered to all children in roughly the order indicated and the formulation was kept deliberately simple so that both the younger as well as the older children could understand [15].

Method of analysis

Once the interviews had been completed, the responses of the children to the interview questions were translated into binary categories (see Table 1) which had bearing on the children's differential understanding of health, illness, pain and fear as well as their means of coping with pain and fear. In assigning the children's responses to pre-determined categories, it is necessary that the categories be discrete; otherwise the responses may not be unequivocally classified. For some interview questions discreteness was attained by classifying responses in terms of a binary opposition. For example, in response to a question (No. 8) on coping strategies children were classified according to whether or not they could devise a cognitive strategy for coping with pain. Such binary distinctions necessarily limit the richness of the data in that the absence of a cognitive strategy does not inform one of the identity of the strategies classified as being non-cognitive. Moreover, it classes together different non-cognitive strategies not by virtue of what they are but by virtue of what they are not. Thus this negative category may conceal certain variations in the data which, although of potential interest, were not directly relevant to the meta-cognitive problems being investigated in the present study. For other interview questions discreteness was attained by classifying children's responses into different categories. For example, in response to a question (No. 3) concerning the circumstances of their hospitalization, the children thought that it had been either a doctor or a member of their family who had called for the hospitalization. The categories of 'doctor' and 'member of family' are not binary oppositions but simply two differences which happen to exhaust the total range of responses. Such categories based upon a difference rather than an opposition do not conceal any variation in the data. From this classification of responses a similarity matrix was calculated according to the Gower coefficient of similarity for binary data which provides the basis for the cluster analysis of the data done with the CLUSTAN program [16]. In the CLUSTAN program the data are summarized by referring to properties of individual objects or cases. If some objects in a cluster have a certain property, other objects in that cluster will also be expected to have the same property: hence one can generalize that the subjects appearing in the same cluster have certain modes of behaviour or cognition in common [17]. The categories according to which subjects are classified are, of course, predetermined, but by using cluster analysis it is the responses of each subject to the interview questions which determine his place in the cluster. Having clustered the subjects according to response, chi-square analysis was then used in order to establish the significance of certain kinds of groupings (e.g. age, sex, etc.) in the formation of the cluster. In other words, rather than predetermining both the grouping of subjects and the categories on which the subjects were classified, I let the grouping of subjects be determined by two statistical techniques.

RESULTS

Cluster analysis based on the similarity matrix derived from the responses of the children to the interview questions relegated the subjects into only two clusters, one comprising 25 subjects and the other 33 subjects (see Table 2). The two clusters were then tested for significance by means of a chi-square analysis on: (1) previous hospitalization vs cluster, (2) ordinal position in the family vs cluster, (3) sex vs cluster and (4) age vs cluster (see Table 3). The analysis did not show any significant difference between the two clusters with regard to previous hospitalization, ordinal position in the family or sex; a significant difference was found, however, with regard to age [18].
With regard to the age of the subjects, the first cluster comprised mostly younger children and the second cluster older children with the age split appearing at 7 years 4 months.

The age range of the subjects in each cluster was calculated by relegating the maximum number of subjects between the ages of x and r to either cluster I or cluster II. On the basis of this calculation the first cluster was identified as comprising younger children until the age of 7 years 3 months and the second cluster older children from the age of 7 years 4 months. This does not mean that all children below 7 years 4 months reason differently from children above 7 years 4 months; rather it means that when such differences emerge in a child's cognitive development these differences occur at roughly 7 to 8 years.
of age. There were four exceptions in the first group of 25 children, who were older than 7 years 3 months and would have had otherwise to be classified in the second group; and there were two exceptions in the second group of 33 children who were younger than 7 years 4 months and would have otherwise been classified in the first group. In sum, only 6 out of 58 children gave responses which did not accord with the responses of their peers [19]. Reproduced below are the chi-square analyses of the responses of the different age groups to the interview questions which have bearing on how children cope with pain and fear in hospital.

Responses to the question of what it is like to be

Table 2. Dendrogram of the classification of the children into two clusters on the basis of their responses to the interview questions

<table>
<thead>
<tr>
<th>Cluster I</th>
<th>Cluster II</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 10</td>
<td>N = 20</td>
</tr>
</tbody>
</table>

χ² corrected for continuity = 0.85. Significance: NS.

Table 3. Significance of groupings in the formation of the clusters

1. Significance of previous hospitalization in the formation of clusters

<table>
<thead>
<tr>
<th>Cluster I</th>
<th>Cluster II</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 11</td>
<td>N = 11</td>
</tr>
<tr>
<td>Date not recorded</td>
<td></td>
</tr>
<tr>
<td>N = 4</td>
<td>N = 2</td>
</tr>
</tbody>
</table>

χ² corrected for continuity = 0.88. Significance: NS.

2. Significance of ordinal position in the family in the formation of clusters

<table>
<thead>
<tr>
<th>Cluster I</th>
<th>Cluster II</th>
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</thead>
<tbody>
<tr>
<td>First born</td>
<td></td>
</tr>
<tr>
<td>N = 15</td>
<td>N = 14</td>
</tr>
<tr>
<td>Date not recorded</td>
<td></td>
</tr>
<tr>
<td>N = 8</td>
<td>N = 15</td>
</tr>
</tbody>
</table>

χ² corrected for continuity = 1.20. Significance: NS.

3. Significance of sex in the formation of clusters

<table>
<thead>
<tr>
<th>Cluster I</th>
<th>Cluster II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td></td>
</tr>
<tr>
<td>N = 10</td>
<td>N = 14</td>
</tr>
<tr>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>N = 15</td>
<td>N = 19</td>
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</tbody>
</table>

χ² corrected for continuity = 32.92. Significance: P < 0.001.
were asked how they would stop themselves from being afraid, the older children were significantly more often able to state a cognitive strategy—i.e. a strategy whereby they denied the impact of fear by thinking of something else so as to exclude fear from consciousness ("I just think about anything, just think I'm kind of on a holiday"). The younger children, however, resorted to non-cognitive strategies; i.e. they did not suggest the use of thought in coping with their experience of fear. Instead they either stated that they would call "mummy" or they suggested that they would deny fear by super-imposition of an activity, such as "start playing another game".

The children were asked several questions concerning physical pain in their tummy when they had a stomach ache. The older children significantly more often than the younger ones offered a physiological reason for their pain, usually to do with the ingestion of a particular kind or quantity of food. The younger children, by contrast, often did not know what produces pain. In line with the older children's different understanding of the occurrence of pain was the finding that the older children were able to suggest a means of seeking relief from pain ("I press on my tummy") whereas the younger children often did not know what to do.

Furthermore, when the children were asked to imagine that they were suffering from a tummy ache and to recount how they would explain this feeling to a doctor or to their parents, the older children were able to describe the physical pain of their illness ("It's like something is pressing on your stomach and it gets worse") whereas the younger children were merely able to evaluate their feelings or to restate that they were ill ("It's bad" or "Mummy I got a tummy ache") and in some cases they were unable to explain their feelings at all. The older children were also better able to perceive when their friends were in pain, either through verbal communication ("Well, if she told me, I would be able to") or through non-verbal signs ("Cause her face would be red"). The younger children, however, did not claim to be able to detect pain in others.

In answering the question of what could you think about to make the pain not hurt so much, the older children often invented cognitive strategies by which they sought to forget pain. For example, one girl said, "I look at the animals of my pillow; just think about them walking about 'cause if I don't think [about the animals], I think of my tummy; but when I'm thinking it goes away". These strategies enable the older children to cope with pain in an autonomous way. However, the younger children, as compared to the older children, were significantly less able to come up with such cognitive strategies; instead they usually confessed that they did not know what they could think about to reduce pain or they repeated their previous non-cognitive strategy, such as calling 'mummy'.

**DISCUSSION AND CONCLUSION**

In this study it became apparent that the younger children (4 years 6 months–7 years 3 months of age) differ from older children (7 years 4 months–13 years 5 months of age) in how they understand their
hospital experience and how they conceive of strategies for coping with fear and pain. The younger children integrate their hospital experience into their family world where mummy and daddy rather than doctors and nurses play the most important role and where their sense of well-being is intimately related to their being in their family. The older children, on the other hand, differentiate between their family world and the hospital world and thereby are able to see the outside world on its own terms. Of course, the different perceptions of the hospital by the younger and older children signify not only the existence of two different worlds but also the difference between the older and younger children's thinking about the world. In the present study two main developmental differences were found with regard to the child's awareness of how he or she copes with pain and fear. First, the older children, unlike the younger children, proposed the same strategies for coping with the emotional feeling of fear as with the physical feeling of pain. Second, the older children were able to suggest cognitive strategies to cope with fear and pain significantly more often than the younger children. The younger children, who were unable to conceive of cognitive coping strategies, stated that they would have to depend on their parents to cope with fear and pain, whereas the older children, who were able to conceive of both cognitive and non-cognitive strategies, thought that they were able to cope autonomously with fear and pain.

These results may be used to interpret one unexplained finding of Vismtamer and Wolfer [22] in their study of children's related distress. Vismtamer and Wolfer compared the adjustment of children who had been psychologically prepared for hospitalization with those who had been unprepared. They found that "younger children (3 to 6) were consistently rated as more upset and less cooperative than older children (7 to 14) in both the control and the treatment conditions" (p. 189 with my italics). That is to say, regardless of whether or not the younger children were prepared with stresspoint information, they were still more distressed than the older children. The age groups in their experiment correspond roughly with the age groups found in the present study. This correspondence suggests that the reason for the distress of the younger children lies not with the conditions of hospitalization but with the child's mental and emotional development. Of course, it has been known for some time [23] that younger children are particularly distressed by their hospitalization. These studies, however, have been based for the most part on behavioural observations of children in hospital and in their homes during the post-operative period. Very little is known about the child's cognitive awareness of hospitalization and how his reaction to the hospital experience might be influenced by his cognitive maturity. The present study indicates that cognitive development is an important aspect of the child's understanding of his hospitalization and of the way in which the child thinks that he or she might cope with the fear and pain encountered in hospital.

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not respond to some of the questions suggests that the nonresponses were not due to the comprehensibility of the question.


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18 Although no sex differences were found among the children with regard to their understanding of hospitalization, still a sex difference was found with regard to their mother's attitude concerning their child's ability to cope with hospitalization. In a separate questionnaire administered at the time of registration to the mothers of the hospitalized children it was found that mothers of girl patients were more concerned about their child's health than mothers of boys. This attitudinal difference was confirmed by the fact that 52% of the mothers of girl patients stayed overnight in hospital whereas only 28% of the mothers of boy patients stayed overnight.

19 Although I found a significant difference between the clusters with regard to age, this does not exclude the possibility that another number of clusters might have showed different results. However, a reliable test determining the significance of the number of clusters was not available at the time of the study. Nevertheless both the chi-square analysis of age versus cluster and chi-square analyses of the differences between the age groups with regard to each interview question showed significant results thereby indicating that the two age groups differed significantly in their cognitive maturity.

Thus it seems that at least one valid aspect of the data has been found. Furthermore, in a recent study on children's cognition of emotions comprising a similar age range (4 years 3 months - 14 years 9 months), two clusters were found with the age break occurring at 7 years 6 months (Reissland N, Children's understanding of early and 'late' emotions M A thesis, Sussex University, 1982). In this study the number of clusters was tested for significance by means of a statistical stopping rule and was found to be significant at the 1% level.

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