

## **CHILDREN'S ADJUSTMENT TO THE FIRST YEAR OF SCHOOLING: INDICATORS OF HYPERACTIVITY, INTERNALISING AND EXTERNALISING BEHAVIOURS**

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### **Abstract**

*The stress associated with the changes and challenges of starting school can manifest in maladaptive or problem behaviours. Research has shown that problem behaviours in the early years, including extreme overactivity, inability to sit still, short attention span, emotional difficulties, and negative attitude predict lower levels of academic achievement and progress and behaviour problems in adolescence. The availability of reliable tools to identify children at risk of difficulties is useful, and can assist educators in easing these reactions, minimising ongoing difficulties, and in adapting their own practices. This paper reports the use of confirmatory factor analysis and structural equation modelling using LISREL to identify items that contribute to constructs of hyperactivity, internalising and externalising behaviour, and to identify the relative contribution of each of these items to the adjustment domain of problem/maladaptive behaviour.*

### **Introduction**

The school context is one of the most influential for shaping the course of human development. The child who makes a satisfactory initial adjustment to school is more likely to be successful in their future progress than a child who has difficulty adjusting to the school situation (life (Belsky & MacKinnon 1994; Cowan, Cowan, Schultz & Henning, 1994; Keinig, 2000).

The transition from a familiar situation into a new or unfamiliar situation, for example, from home to childcare/preschool, to primary school, or secondary school is characterised by change, tensions and uncertainties (Cowan, Cowan, Shulz & Henning, 1994; Dockett & Perry, 1999; Fabian, 2000). A child's sense of being is often challenged by the new and unfamiliar (Dunlop, 2000). They are faced with a new environment of buildings and classrooms, new school and teacher expectations, new academic challenges, and acceptance into a new peer group. They are required to function independently, develop relationships with staff and peers, and to behave in ways that are appropriate for their class and school including conforming to rules (Cowan et al., 1994; Dockett, Perry & Tracey, 1997; Fabian, 2000; Margetts, 2003).

Adjustment to school is supported by a number of skills including social competence, problem solving skills, self reliance and determination, knowing about 'not knowing' and what to do about it, behavioural control and academic competence (Fabian, 2000b; Margetts, 2002). Children's adjustment is supported when they follow directions, take responsibility for their belongings, take turns, regulate their behaviour in response to others, and respond appropriately to frustration.

Adjustment to school is influenced by the level of comfort, familiarity and predictability children experience. Children are at risk of not adjusting easily to school when there is a mismatch between the personal and cultural skills, attitudes and knowledge they bring to school, and the expectations of the school itself (Clancy, Simpson & Howard, 2001; Fabian, 2000; Margetts, 2003). The stress associated with the changes and challenges of starting school can manifest in maladaptive or problem behaviours (Creasey, Mitts, Catanzaro, 1995). Reactions such as anxiety, avoidance or negative attitudes are expected during transitions but

they may also be the signs of early adjustment difficulties (Prior, 1996). When children adjust quickly to school, much of the potentially negative effects on children's confidence and school behaviour can be overcome (Belsky & MacKinnon, 1994). The concern then is for children in whom these responses are persistent.

Children who are non-compliant, disorganised, distractible, or antisocial are more likely to experience adjustment difficulties than other children (Margetts, 2002) and it is the ongoing early behavioural difficulties that are of concern (Belsky & MacKinnon, 1994; Cowan et al., 1994, Taylor, 1998). For example, problem behaviours in the early years, including extreme overactivity, inability to sit still, short attention span, emotional difficulties, and negative attitude has predicted behaviour problems in adolescence (Caspi, Henry, McGee, Moffitt & Silva, 1995). Children with high levels of hyperactivity and impulsive behaviour in the first year of school (reception) had significantly lower levels of academic achievement and progress three years later as the end of Grade 2, (Merrell & Tymms, 2001), and similar findings for children in grade 2 and later in grade 6 were reported by McLelland & Morrison (2003). Externalising, and impulsive/hyperactive behaviours at the start of school were associated with victimisation by peers three years later (Schwartz, McFadyen-Ketchum, Dodge, Pettit & Bates, 1999), and similar behaviours in Grade 6 (Pettit, Dodge & Bates, 1997).

Given the pervasiveness of school adjustment problems in having lasting or cumulative effects and the potential costs to the individual and to society there is a need to study early school adjustment and to identify and understand the behaviours that contribute to children's adjustment, and to put in place strategies to promote these skills.

### **Identifying behavioural responses to starting school**

Measures of adjustment in terms of behaviour include constructs or domains related to internalising and externalising behaviours (Caldwell & Pianta, 1991), anxiety, avoidance and negative attitudes in class (Ladd & Price, 1987), accepting and conforming to the demands of classroom routine and organisation (Renwick, 1984), restlessness, fidgeting and poor concentration (Rydell, 1989). Teachers and parents comment that children are hyperactive or aggressive or withdrawn but have difficulty defining the particular behaviours that contribute to these broad constructs.

There is a range of valid and reliable instruments for measuring adjustment and adaptability. The Social Skills Rating System (SSRS) (Gresham & Elliott, 1990) is a multi-rater norm-referenced instrument designed to identify social competence and adaptive behaviour in children across three domains - social skills, problem behaviours, and academic competence. The social skills domain includes the sub-domains of co-operation, assertion, responsibility, empathy and self-control. The problem behaviour domain includes the sub-domains of externalising problems, internalising problems and hyperactivity. Academic competence is one small domain (ACER, 1994). The literature suggests that these SSRS domains and sub-domains are appropriate measures of adjustment.

Typically, in educational and behavioural sciences, research is based on theoretical constructs or variables that cannot be directly observed or measured of themselves (Jöreskog & Sörbom, 1989). These latent variables are usually measured using a number of indicators which together makes up these concepts and are assessed using ordinal rating scales (Healy & Goldstein, 1976). For example, in the SSRS, the latent variable, externalising behaviour, is measured using six observable items including, 'fights with others', 'threatens or bullies others', 'gets angry easily', 'has temper tantrums'. The relative frequency of specific behaviours is summarised by ratings, '0' for Never, '1' for Sometimes, '2' for Very Often.

While the use of generic rating scales across countries and cultural groups is common, this practice can fail to account for the possibility that some elements may be culturally inappropriate. What is also overlooked is the fact that many adjustment skills and behaviours are context specific (Gresham & Elliott, 1987). The skills and behaviours that are appropriate or valued in North American schools may not be appropriate or valued in Melbourne primary schools, or may have a different level of importance placed on them.

The literature raises some concerns in relation to the analyses of ordinal variables (Jöreskog & Sörbom, 1989, Stevens, 1996, Rowe, 1997). Jöreskog (1994, p.383) noted that it is generally assumed that observations on an ordinal variable represent a set of ordered categories and that "...a person who responds in one category has more of a characteristic than a person who responds in a lower category". He warned that ordinal variables "...are not continuous variables and should not be treated as if they are" (Jöreskog, 1994, p. 383). For example, we assume that a measure of '2' for the rating very often 'gets angry easily', is one more than a measure of '1' for the rating sometimes 'gets angry easily'. The measures of '1' or '2' are arbitrary, ordinal measures. 'Very often' and 'sometimes' are different qualitative ratings and not measured on the same metric.

Jöreskog (1994, p.383) stressed that ordinal variables do not have origins or units of measurement. Means, variances and covariances of ordinal variables have no meaning...", and the treatment of "...ordered categories of an ordinal variable as numbers on an interval scale..." when computing a traditional covariance matrix results in non-normal, non-continuous distribution and biased estimates of model parameters. In response to these concerns, the use of structural equation modelling techniques has been advocated for analysing such data (Jöreskog & Sörbom, 1989, Stevens, 1996, Rowe, 1997).

### **Establishing valid measures of behaviour**

Structural equation models use statistical tools that extend traditional regression and analysis of variance by allowing for measurement error to be taken into account (Stevens, 1996). SEM aims to estimate and explain the extent of covariation among unobserved latent variables or constructs (Rowe, 1997). The explanatory methods provided by SEM techniques also enable the 'fit' of data to substantive theoretical models to be tested. They also explain various causal effects.

This involves the use of confirmatory factor analysis (CFA) which allows the researcher to specify which indicator variables contribute to the latent variable. CFA takes into account the measurement properties of the observed predictor variables (Rowe, 1997) and calculates the error terms of the observed variables, factor loadings of the latent variable on the observed variable, and the covariance among the indicators (factors) (Stevens, 1996). The researcher is able to test and explain the hypothesis or model and establish that there is a relationship among the observed indicator variables and the unobserved variable being measured (Stevens, 1996). Stevens (1996) stressed the importance of basing the model on strong theory or a strong empirical base. Theoretical considerations are essential, particularly in substantiating modifications to the model to achieve a 'good fit'.

Therefore applying CFA techniques enables a 'good fitting' model to be established so that the computed composite construct (latent variable) consists of valid indicators and the joint variances and covariances among the observed variables in the model are explained. Models can be represented in both equation notation or in diagrams known as path models (Stevens, 1996). In this way, for example, we are able to identify the particular behaviours that most strongly contribute to hyperactivity.

## **The study**

This study was conducted to identify items that contribute to the constructs of externalising, internalising and hyperactive behaviours in the first year of schooling, and to identify the relative contribution of each of these items to each particular behaviour sub-domain.

Data were obtained using the problem behaviour domain (Items 31-48), of the Social Skills Rating System (SSRS) (Teacher Form) (Elementary Level) which includes the subscales of externalising behaviour, internalising behaviour and hyperactivity. Teachers were aware of the domain category (problem behaviour), but were unaware of the sub-domain categories. Tables 1 to 3 provide a list of each sub-domain item. Each item is rated using 3-point Likert-type scales to indicate the frequency of specific behaviours, '0' for Never, '1' for Sometimes, '2' for Very Often.

## **The sample**

Subjects were 212 children in twelve (12) preparatory classes (first year of school) across four (4) Melbourne government primary schools. Children had attended school for 9 weeks. Each of the twelve (12) classroom teachers participated in the study. Schools were selected on the basis of attendance by significant numbers of children involved in a larger study looking at links between adjustment to school and prior to school child care. Children with disabilities or who spoke English as a second language were included in the study. All classes were straight preparatory classes and did not include composite or multi-age classes. All teachers were female.

## **Analysis**

The frequency ratings for specific behaviours provide non-interval, ordinal data. Confirmatory Factor Analysis was employed to test the fit of SSRS items to each sub-domain measure of adjustment. One-factor congeneric measurement models using LISREL7, employing a listwise method for deleting missing data, were fitted to the constituent ordinal-scaled, item data, based on a scaled covariance matrix of the polychoric correlations from the LISREL preprocessor PRELIS 1 (Jöreskog & Sörbom, 1988). Through the establishment of 'good fitting' models, valid indicators of each latent variable or sub-domain of adjustment to school were identified and their variance explained.

## **Results**

The following tables summarise results for the subdomains of externalising behaviour, hyperactivity and internalising behaviour as measures of adjustment to the first year of schooling. Valid indicators are accompanied by their raw factor score (FS) regression weights shown in 'normal' type, and proportionally weighted FS's shown in 'bold' type. These factor score regression weights indicate the contribution of each item to each sub-domain of adjustment which have been adjusted for measurement error. The composite scale reliability coefficient,  $r^2$  indicates the contribution of valid indicator items to each construct.

The results shown in Table 1 indicate that items 31, 41, 42, and 43 are valid indicators of externalising behaviour and jointly contribute 95.1% of the variance to this measure of adjustment. Item 43 'gets angry easily' is the most significant indicator, contributing 48.8% of the variance in this measure of adjustment. Items 33 and 44 are not valid indicators of externalising behaviour in this model.

TABLE 1 SSRS items and valid predictors of externalising behaviours

EXTERNALISING n = 213		Item Weights <sup>a</sup>	
Item: 31	fights with others	.129	<b>.124</b>
33	threatens or bullies others		
41	argues with others	.192	<b>.184</b>
42	talks back to adults when corrected	.213	<b>.204</b>
43	gets angry easily	.509	<b>.488</b>
44	has temper tantrums		
<b>r<sup>2</sup>= .951</b>		<b>χ<sup>2</sup> (2) =10.79 p=.005 AGFI=.885 RMR=.017</b>	

<sup>a</sup> raw factor score (FS) regression weights shown in 'normal' type and proportionally weighted FS's shown in 'bold' type

Valid indicators of internalising behaviour are shown in Table 2. Items 32, 34, 38, and 46 contribute to a good fitting model of this behavioural measure of adjustment. Item 34 'appears lonely' and Item 46 'acts sad or depressed' contribute 35.4% and 33.5% respectively to the variance. Item 32 'has low self-esteem' and Item 38 'shows anxiety about being with a group of children' are covariates and jointly contribute 31.1% of the variance.

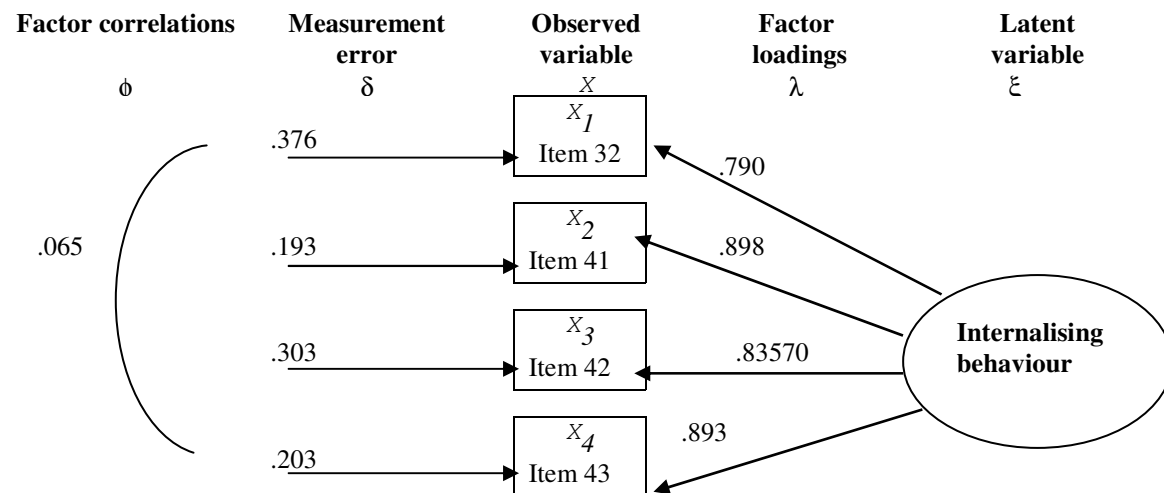
TABLE 2 SSRS items and valid predictors of internalising behaviours

INTERNALISING n = 213		Item Weights <sup>a</sup>	
Item: 32*	has low self esteem	.136	<b>.129</b>
34	appears lonely	.374	<b>.354</b>
38*	shows anxiety about being with a group of children	.192	<b>.182</b>
39	is easily embarrassed		
45	likes to be alone		
46	acts sad or depressed	.353	<b>.335</b>
<b>r<sup>2</sup>= .919</b>		<b>χ<sup>2</sup> (1) =.650 p=.419 AGFI=.985 RMR=.004</b>	

<sup>a</sup> raw factor score (FS) regression weights shown in 'normal' type and proportionally weighted FS's shown in 'bold' type

\* Items 32 and 38 are covariates

The result of fitting the one-factor congeneric model to the data for internalising behaviour is shown in the path model in Figure 1. The factor loadings indicate causal relationships of the latent variable internalising behaviour, on the observed items or variables. The curved line indicates covariance among observed variables.



model 'goodness of fit' indices: **r<sup>2</sup>= .919** **χ<sup>2</sup> (1) =.650** **p=.419** **AGFI=.985** **RMR=.004**

FIGURE 1 One-factor measurement model for internalising behaviour

Measurement errors include the part of each observed variables that is unexplained by the variable, and measurement error due to the lack of reliability of the observed variables. Thus the observed variables are influenced by the latent variable and the measurement error.

Results in Table 3 indicate that items 35, 37, 40 and 48 are valid indicators of hyperactivity and account for 96.2% of the variance of this measure of adjustment. Item 37 'disturbs ongoing activities' is the most significant indicator, contributing 38.1% of the variance when the individual item contributions are adjusted for measurement error. Item 40 'doesn't listen to what others are saying' contributes 30% to the variance in hyperactivity. Items 36 and 47 are not valid indicators of hyperactivity in this model.

TABLE 3 SSRS items and valid predictors of hyperactivity

HYPERACTIVITY		n = 213	Item Weights <sup>a</sup>		
Item: 35	is easily distracted		.147	<b>.142</b>	
36	interrupts conversations of others				
37	disturbs ongoing activities		.395	<b>.381</b>	
40	doesn't listen to what others are saying		.310	<b>.300</b>	
47	acts impulsively				
48	fidgets and moves excessively		.183	<b>.177</b>	
<b>r<sup>2</sup>= .962</b>		<b>χ<sup>2</sup> (2)=1.00</b>	<b>p= .606</b>	<b>AGFI=.988</b>	<b>RMR=.004</b>

<sup>a</sup> raw factor score (FS) regression weights shown in 'normal' type and proportionally weighted FS's shown in 'bold' type

## Discussion

The present study has indicated behaviours that contribute to measures of externalising and internalising behaviour, and hyperactivity, and may impede children's adjustment to school. An awareness of these observable behaviours can assist early childhood staff in preschools and the early years of schooling identify children who may be at risk of not adjusting well to school. The identification of the 'opposite' behaviours (for example, the opposite of item 40 in Table 3 would be 'listens to others') can assist teachers in identifying and fostering behaviours that may better support children's adjustment to school.

Results suggest that aggressive or externalising behaviours are best identified through such responses such as; 'gets angry easily', 'talks back to adults', 'argues and fights with others', are at risk of adjustment difficulties. Results also suggest that internalising behaviours are often associated with anxiety and sadness such as, 'acts sad or depressed', 'appears lonely', 'appears anxious in groups', or when children are perceived as having low self-esteem. In relation to hyperactive behaviours the are valid indicators of this construct: 'disturbs activities', 'doesn't listen to others', 'fidgets and moves excessively', and 'is easily distracted'. It is these behaviours that are more likely to predict children having difficulty adjusting to school.

While aggressive, anxious and restless behaviours are likely to manifest themselves or to be intensified during the transition to schooling (Creasey et al., 1995), it is the children in whom these behaviours persist beyond the first six to eight weeks, who are most at risk of ongoing difficulties. Taken together with the challenges facing children as they commence school it is important that children at preschool are equipped with the skills to better cope with transition difficulties. Educators can encourage and support children to interact with their peers and adults in positive ways, and to cope with frustrations and restrictions.

Children should be supported in developing self-confidence, and have opportunities to experience success when trying new things and coping with the unexpected. When children are given consistent guidance and support in being responsible for controlling their feelings and behaving in acceptable and considerate ways without disturbing or hurting others, they

are more likely to exhibit self control.

While many strategies can be implemented at preschool, it is critical that children also have opportunities to visit the school prior to commencement. If the setting is familiar, children are more likely to adjust to new demands and expectations. When children are prepared for making the transition to school they gain self-confidence and are more likely to succeed. Other research with the same cohort of children has shown a significant association between children's adjustment to school and multiple opportunities for children and families to visit and become familiar with the school prior to commencement. Where schools conducted high numbers of transition activities children experienced fewer problem behaviours than children who attended schools with a limited number of transition opportunities prior to commencement. Furthermore the presence of a familiar playmate in the same class was associated with children adjusting better to school and demonstrating higher levels of appropriate behaviours (Margetts, 2003).

## **Conclusion**

The use of SEM techniques for exploring and explaining direct, indirect and interdependent effects of observable variables has assisted in identifying particular behaviours that contribute to the broader constructs of hyperactivity, internalising and externalising behaviours, for children attending four primary schools across Melbourne, Australia. While the identification of these behaviours is useful for identifying and assessing the likelihood of children having difficulty adjusting to school and adapting approaches accordingly, the identification of the behaviours that support adjustment and adaptation is also important. Although it can be assumed that the opposite of each 'problem' behaviour identified in this study would support children's adjustment to school, this should be validated by through the development and testing of a set of indicators. Such a set would provide teachers with greater clarity for their curriculum, observations and planning for individuals and groups of children.

The use of interval composite constructs, developed from the models described in this paper, for each behavioural domain of adjustment, along with a range of factors that may impact on children's adjustment to school should enable an exploration of the interdependent covariation and effect relationships among these measures. In this way the use of SEM techniques should contribute to a greater understanding of children's behavioural adjustment to school. While the instrument used to measure adjustment has not been developed on a background of transition theories, but rather on broader adaptive understandings, further development and testing grounded in transition theory may lead to a more valid and reliable tool.

The chosen instrument points to behaviours that may intensify under the strain of transition demands. It is important to remember that transition itself may cause (temporary) reactions that may look like behaviour problems but are coping patterns of an adjusting child. Easing those reactions and prevention of permanence is a genuine aim of transition programs. A problem is, that behaviour problems like hyperactivity, internalising or externalising behaviour in a clinical sense cannot be sufficiently dealt with through transition programs, but may need professional (family) treatment. Early identification is important especially for transition and school progress. A future longitudinal study would be helpful to understanding and to differentiate between transitional reactions and behaviour problems of other origin.

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