Prevalence of Hyperactivity-Impulsivity and Inattention Among Canadian Children: Findings from the First Data Collection Cycle (1994-1995) of the National Longitudinal Survey of Children and Youth

Final Report

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Abstract

Hyperactivity, impulsivity, and inattention are among the most common behaviour problems in children. The aim of this study was to estimate the prevalence of hyperactivity-impulsivity and inattention in the Canadian population of 2-11-year-old girls and boys, using data from the first National Longitudinal Survey of Children and Youth (NLSCY) collection cycle (1994-1995). Latent class analyses indicated that an unrestricted three-class model provided an adequate fit to the hyperactivity-impulsivity and inattention data for the majority of 2-11-year-old girls and boys. The preferred 3-item-combination for hyperactivity-impulsivity included Can't sit still, is restless, or hyperactive; Has difficulty awaiting turn in games or groups; and Cannot settle to anything for more than a few moments. The preferred 3-item-combination for inattention included Can't concentrate, can't pay attention for too long; Stares into space; and Is inattentive. The first latent class (i.e., low) included children who did not tend to manifest hyperactive-impulsive and inattentive behaviours. The second latent class (i.e., medium) included children who tended somewhat to manifest hyperactive-impulsive and inattentive behaviours. The third latent class (i.e., high) included children who tended often to manifest hyperactive-impulsive and inattentive behaviours. Findings indicated that between 5% and 17% of 2-11-year-old girls and between 9% and 23% of 2-11-year-old boys often manifested hyperactive-impulsive behaviours. The majority of children, however, either did not manifest hyperactive-impulsive behaviours or did so only on an occasional basis. We found a similar pattern of results for inattention. Specifically, between 1% and 18% of 2-11-year-old girls and between 1% and 14% of 2-11-year-old boys often manifested inattentive behaviours. However, the majority of children either did not manifest inattentive behaviours or did so only occasionally. Our results indicate that children differ in their probability of manifesting hyperactive-impulsive and inattentive behaviours. As such, it may be important to view hyperactive-impulsive and inattentive behaviours along a continuum of increasing frequency rather than as behaviours that are either present or absent in a child. The results of our study have several important public policy implications. We provided estimates of the prevalence of hyperactivity-impulsivity and inattention separately for 2-11-year-old girls and boys from the Canadian population. These prevalence estimates may help guide decisions about the needs of children with behaviour problems with regard to treatment interventions and to efforts aimed at preventing the worsening of behaviour problems over time. Additionally, we provided a means of identifying children with problematic hyperactive-impulsive and inattentive behaviours. Given the limited public resources that currently exist for mental health services, our findings may help public policy makers to best channel resources toward children who are most in need.

1. Introduction

Hyperactivity, impulsivity, and inattention are among the most common behaviour problems in children. The aim of this study was to estimate the prevalence of hyperactivity-impulsivity and inattention in the Canadian population of 2-11-year-old children. We obtained gender-specific prevalence estimates using latent class analysis based on data from the first cycle (1994-1995) of the National Longitudinal Survey of Children and Youth.

2. Literature Review

2.1 Prevalence of Attention Deficit-Hyperactivity Disorder (ADHD)

In a review of general population studies of ADHD in school-age children, Scahill and Schwab-Stone (2000) reported the best prevalence estimate to range from 5-10%. Two Canadian community surveys that examined ADHD prevalence in children and adolescents were the Quebec Child Mental Health Survey (Breton et al., 1999; Valla et al., 1994) and the Ontario Child Health Study (Offord et al., 1987; Offord, Boyle, & Racine, 1989; Szatmari, Offord, & Boyle, 1989). The Quebec study collected child, parent, and teacher interview data for 2,400 6-14-year-old children. The Ontario study collected data on 2,674 4-16 year olds using child, parent, and teacher behaviour checklists. Both studies had approximately equal numbers of girls and boys.

Table 1 presents six-month prevalence rates of ADHD. Both studies found overall prevalence rates that were consistent with those reported in Scahill and Schwab-Stone's (2000) review. The Quebec study found significant gender and age effects according to child and parent reports. Boys had higher ADHD rates than girls, and 6-8 year olds had higher rates than 12-14 year olds. Child reports also indicated a significantly higher rate of ADHD for 9-11-year-old children, compared to 12-14 year olds. Teacher reports from the Quebec study showed a significant gender by age interaction. Specifically, 6-8-year-old girls had higher ADHD rates than 9-11-year-old girls, and 9-11-year-old boys had higher ADHD rates than 9-11-year-old girls. In the Ontario study, ADHD rates were higher for boys than girls across informants.

Table 1
Six-month ADHD Prevalence Rates from two Community Surveys of Children and Adolescents

			Age Group (Years)			
Study	**Informant**	**Gender**	**6-8**	**9-11**	**12-14**	**6-14**
Quebec Child Mental Health Survey (Breton et al., 1999; Valla et al., 1994)	Child	Girls	1.8	1.5	0.7	
		Boys	5.6	6.9	2.8	
		Total	3.8	4.3	1.8	3.3 (2.6, 4.2)
	Parent	Girls	4.1	2.1	1.9	
		Boys	9.6	7.3	5.1	
		Total	6.9	4.8	3.5	5.0 (4.1, 6.0)
	Teacher	Girls	7.5	2.9	a	
		Boys	12.1	13.2	a	
		Total	9.8	8.1	a	8.9 (7.4, 10.7)
	Informant	**Gender**	**4-11[b]**	**12-16[c]**		
Ontario Child Health Study (Offord et al., 1987; Offord et al., 1989; Szatmari et al., 1989)	Parent	Girls	0.8	1.4		
		Boys	2.1	3.1		
	Teacher/Child	Girls	2.5	1.8		
		Boys	7.3	4.0		

[a]Teacher interviews were not collected; [b]Based on parent and teacher reports; [c]Based on parent and child reports
Note: 95% confidence intervals are in parentheses.

2.2 ADHD Subtypes

While most past epidemiological studies have focused on the prevalence of ADHD as a whole, the current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994) identifies three ADHD subtypes - predominantly inattentive, predominantly hyperactive-impulsive, and combined. The combined subtype refers to children who meet symptom criteria for both inattention and hyperactivity-impulsivity. A number of epidemiological studies have used the DSM case identification strategy to investigate the prevalence of ADHD subtypes in children and adolescents. Table 2 presents four such studies originating from the United States (Nolan, Gadow, & Sprafkin, 2001; Wolraich, Hannah, Pinnock, Baumgaertel, & Brown, 1996), South America (Pineda et al., 1999), and Australia (Gomez, Harvey, Quick, Scharer, & Harris, 1999).

Table 2
Prevalence Rates (%) of ADHD Subtypes from four General Population Studies of Children and Adolescents

					Prev. Rates (%)		
Study	**Sample Size**	**Informant**	**ADHD Subtype**	**Gender**	**Age 3-5**	**Age 5-12**	**Age 12-18**
United States (Nolan et al., 2001)	3,006	Teacher ratings	Inattentive	Girls	4.0	6.0	8.0
				Boys	3.8	14.4	14.5
			Hyperactive-Impulsive	Girls	5.1	1.1	0.0
				Boys	7.6	3.4	1.6
			Combined	Girls	4.6	1.1	0.8
				Boys	10.1	5.3	4.0
					Age 5-12		
United States (Wolraich et al., 1996)	8,258	Teacher ratings	Inattentive	Girls	3.5		
				Boys	7.2		
			Hyperactive-Impulsive	Girls	0.9		
				Boys	3.8		
			Combined	Girls	1.6		
				Boys	5.3		
					Age 5-11		
Australia (Gomez et al., 1999)	1,275	Parent ratings	Inattentive	Girls	1.9		
				Boys	6.8		
			Hyperactive-Impulsive	Girls	1.9		
				Boys	3.6		
			Combined	Girls	1.8		
				Boys	4.1		
		Teacher ratings	Inattentive	Girls	3.0		
				Boys	8.9		
			Hyperactive-Impulsive	Girls	0.3		
				Boys	1.5		
			Combined	Girls	0.9		
				Boys	3.5		
					Age 4-17		
South America (Pineda et al., 1999)	540	Parent checklists	Inattentive	Girls	3.4		
				Boys	5.1		
			Hyperactive-Impulsive	Girls	7.1		
				Boys	9.9		
			Combined	Girls	1.9		
				Boys	4.8		

Results indicate that the U.S. and Australian studies tended to identify inattention as the most frequent subtype for girls and boys. This finding is consistent with reviews of population-based samples (Carlson & Mann, 2000). In the South American study, the most frequent subtype for girls and boys was hyperactivity-impulsivity. All four studies found boys to have higher rates than girls for each ADHD subtype, with the exception of 3-5 year olds in Nolan et al.'s (2001) study. These differences, however, were not tested statistically in the Australian study and in the U.S. study by Wolraich et al. (1996). In the South American study, the gender difference reached statistical significance only for the combined subtype. Turning to age effects, the South American study found that 4-5 year olds had the highest levels of hyperactivity-impulsivity, while the inattentive and combined subtypes were most frequent in 6-11 year olds (results not shown). These age differences, however, were not tested for statistical significance. Findings on age effects from the U.S. study by Nolan et al. (2001) were consistent with those from South America in showing that preschool children had higher rates of hyperactivity-impulsivity while older children and adolescents had higher inattention rates.

2.3 Diagnostic Uncertainty

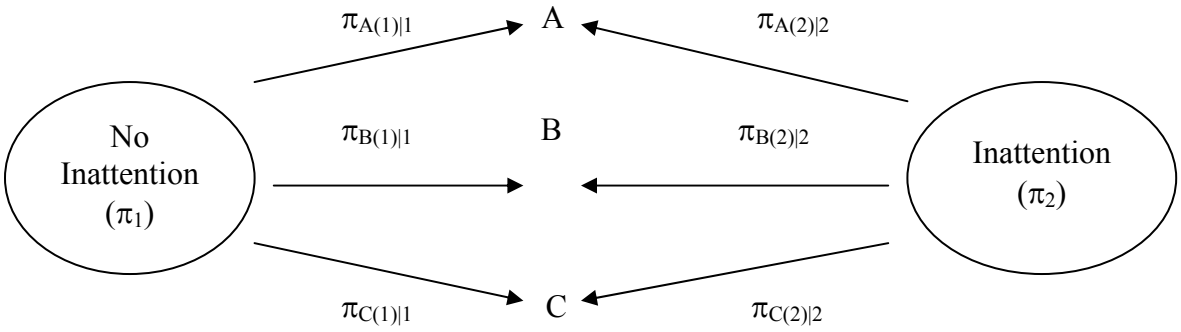
There are various approaches to identifying children with problems of inattention and hyperactivity-impulsivity. In the DSM-IV, a child receives a diagnosis of ADHD-predominantly inattentive type if six or more inattentive symptoms (out of nine) are endorsed. A child receives a diagnosis of ADHD-predominantly hyperactive-impulsive type if six or more hyperactive-impulsive symptoms (out of nine) are endorsed. If six or more inattentive *and* hyperactive-impulsive symptoms are endorsed, a child receives a diagnosis of ADHD-combined type.

Most studies investigating ADHD prevalence have relied on a categorical approach, such as that used in the DSM-IV, where a diagnosis is made if the number of symptoms that an individual has exceeds a specified cut-off or threshold value. Strictly speaking, there is no cut-off that distinguishes perfectly between those individuals who suffer from a particular disorder and those who do not, given that symptoms do not possess perfect sensitivity (defined as the probability that an individual who truly has a disorder will manifest the symptoms in question) and specificity (defined as the probability that an individual who truly does not have a disorder will not manifest the symptoms in question). Therefore, some individuals will incorrectly be classified as having a disorder while others will incorrectly be classified as not having a disorder. These misclassification errors will produce biased disorder prevalence estimates. In other words, when estimating the prevalence (p) of a particular disorder, a number of truly non-disordered individuals will be classified as cases ([1 – p] * [1 – cut off's specificity]), and a number of truly disordered individuals will be classified as non-cases (p * [1 – cut off's sensitivity]). Let us consider a situation where the cut off's sensitivity and specificity are both high (.80), and the disorder's true prevalence rate is .05. In this case, the estimated prevalence rate of .23 ([p * sensitivity] + [(1 – p) * (1 – specificity)]) would be biased by a factor of 4.6.

2.4 Latent Class Approach

While there is no "gold standard" for distinguishing perfectly between individuals with and without a disorder, it is possible to obtain maximum likelihood estimates of the prevalence of a particular behaviour problem using latent class analysis (LCA; Rindskopf & Rindskopf, 1986). Let us consider a situation where three imperfectly sensitive and specific inattention behaviours are rated by a single informant as either present or absent. These behaviours may be used to distinguish between two inattentive states, specifically children with inattention and children without inattention. In this two-class model, each child is assumed to belong in only one of the two latent classes within a single latent variable. Children who belong in the inattention latent class tend to manifest inattentive behaviours, while children in the no inattention latent class tend not to manifest inattentive behaviours. This basic LCA model can be described more formally using two types of parameters, namely latent class probabilities and conditional behaviour rating probabilities. Latent class probabilities refer to the probability that a randomly selected child in the population will belong to each of the latent classes. In this way, latent class probabilities provide information about the prevalence of inattention. Conditional behaviour rating probabilities refer to the probability that a specific behaviour will be *present* among children in the *inattention* latent class (i.e., behaviour sensitivity) and *absent* among children in the *no inattention* latent class (i.e., behaviour specificity). Figure 1 illustrates this two-class model of inattention. Latent class probabilities are represented as π_1 (i.e., no inattention latent class) and π_2 (i.e., inattention latent class). Note that $\pi_1 + \pi_2 = 1$. The figure also illustrates the sensitivity and specificity of the three inattention behaviours (A, B, C). In particular, $\pi_{A(1)|1}$ represents the specificity for behaviour A; that is the probability that behaviour A is absent (1) among children with no inattention (1). Conversely, $\pi_{A(2)|2}$ represents the sensitivity for behaviour A; that is the probability that behaviour A is present (2) among children with inattention (2).

Figure1: Illustration of a two Latent Class Model of Inattention



Note: A, B, and C are behaviour items. π_1 represents the first latent class of No Inattention. π_2 represents the second latent class of Inattention. $\pi_{A(1)|1}$, $\pi_{B(1)|1}$, and $\pi_{C(1)|1}$ represent the probability of behaviours A, B, and C being absent in the first latent class of No Inattention. $\pi_{A(2)|2}$, $\pi_{B(2)|2}$, and $\pi_{C(2)|2}$ represent the probability of behaviours A, B, and C being present in the second latent class of Inattention.

3. Method

3.1 Sample and Procedure

The National Longitudinal Survey of Children and Youth (NLSCY) is a Canadian nation-wide household survey that is being conducted by Human Resources Development Canada and Statistics Canada. It conducts biennial assessments on a representative sample of newborn to 11-year-old Canadian children. Households included in the survey were chosen using a stratified multistage probability sample design based on information collected by Statistics Canada's Labour Force Survey (LFS), which produces unemployment estimates. The LFS defines a household as all individuals living within a selected dwelling (residence). It surveys approximately 59,000 Canadian households and covers 97% of the population aged 15 years and older. The LFS excludes children living in institutional facilities, on Aboriginal reserves, and in the two Canadian territories. It should be noted, however, that data for Aboriginal children and children living in the Canadian territories are being collected in separate surveys (Statistics Canada and Human Resources Development Canada, 1995, 1997).

The NLSCY is a longitudinal-sequential design, encompassing both a cross-sectional and longitudinal dimension. The first NLSCY data collection cycle (1994-1995) surveyed a maximum of four 0-11-year-old children per household. In each household, the child's mother (in 89.4% of cases) completed a personal interview on child, parent, and family characteristics. Complete cycle 1 data were obtained from 13,439 households across Canada, representing an overall response rate of 86.3% and resulting in a sample of 22,831 newborn to 11-year-old children. Our study was cross-sectional as we focused exclusively on 2-11-year-old children from the first data collection cycle whose mothers responded to interview items on hyperactivity-impulsivity and inattention. Table 3 presents the distribution of children by age, gender, and behaviour. There were comparable numbers of girls and boys, and the non-response rate was minimal (below 5%).

Table 3
Distribution of Children from the First NLSCY Cycle (1994-1995)

	Girls			Boys		
Age (Years)	Total[a]	Hyperactivity-Impulsivity (%)[b]	Inattention (%)[c]	Total	Hyperactivity-Impulsivity (%)	Inattention (%)
2	963	96.3	97.3	1,000	96.4	96.9
3	928	97.2	97.8	1,018	97.4	97.7
4	966	98.3	98.7	968	97.5	97.4
5	878	98.5	98.4	916	96.1	96.2
6	850	98.0	97.9	951	97.6	97.6
7	892	97.1	97.2	857	97.8	97.7
8	887	97.6	97.7	893	96.9	96.9
9	838	97.4	98.1	896	97.1	97.1
10	863	98.4	98.6	904	98.3	98.2
11	822	98.8	98.9	845	98.2	98.3
Total	8,887	97.7	98.1	9,248	97.3	97.4

[a]Total number of children included in the first NLSCY data collection cycle; [b]Percentage of children with complete data for the three hyperactivity-impulsivity items selected for analyses; [c]Percentage of children with complete data for the three inattention items selected for analyses

3.2 Measures

The behaviour items included in the NLSCY interviews were based on measures used in the Montreal Longitudinal and Experimental Study (Tremblay et al., 1991; Tremblay, Vitaro, Gagnon, Royer, & Piché, 1992) and the Ontario Child Health Study (Boyle et al., 1987; Offord et al., 1987). Five items measured hyperactivity-impulsivity, namely: (1) Can't sit still, is restless, or hyperactive, (2) Fidgets, (3) Has difficulty awaiting turn in games or groups, (4) Is impulsive, acts without thinking, and (5) Cannot settle to anything for more than a few moments. The four items that measured inattention were (1) Is distractible, has trouble sticking to any activity, (2) Can't concentrate, can't pay attention for too long, (3) Stares into space, and (4) Is inattentive. Mothers rated each item along a 3-point scale from *never or not true* to *sometimes or somewhat true* to *often or very true*.

3.3 Statistical Analyses

We used latent class analysis to estimate the prevalence of hyperactivity-impulsivity and inattention in the Canadian population of 2-11-year-old children using data from the first NLSCY cycle (1994-1995). We tested three latent class models, specifically independence, unrestricted two-class, and unrestricted three-class model. The independence model posits one latent variable composed of one latent class. In other words, the ratings for any one observed behaviour are statistically independent of ratings for the remaining observed behaviours. The unrestricted two-class model posits one latent variable composed of two latent classes (e.g., inattention and no inattention). The model is unrestricted because no restrictions have been placed on the values that the parameters can assume. The unrestricted three-class model posits one latent variable composed of three latent classes: a low latent class in which children tend to be rated by their mothers as *never or not true* on all behaviours; a medium latent class in which children tend to be rated by their mothers as *sometimes or somewhat true* on all behaviours; and a high latent class in which children tend to be rated by their mothers as *often or very true* on all behaviours. This model was used successfully by Baillargeon, Tremblay, and Willms (1999) to estimate the prevalence of physical aggression in 2-11-year-old Canadian children using data from the first NLSCY cycle.

All statistical analyses were conducted using the freely distributed LEM computer program for the analysis of categorical data (Vermunt, 1997). The fit of latent class models were assessed with the Pearson chi-square (χ^2) and the likelihood-ratio chi-square (L^2) statistics (Clogg, 1979; Dillon & Mulani, 1984; McCutcheon, 1987). The Cressie-Read (CR; Cressie & Read, 1984) goodness-of-fit statistic also was useful when there was a discrepancy between the χ^2 and L^2 statistics. While we had information on five hyperactivity-impulsivity items and four inattention items, we decided to test latent class models that included only three items. Including all items

would have resulted in large multidimensional tables with a number of zero or near-zero frequency cells. This would have made it difficult to assess the fit of our latent class models using the $\chi^2$and L^2 goodness-of-fit statistics (Fienberg, 1980). We ran each latent class model 100 times to better guard against the problem of local maximum solutions.[1] We assessed the fit of latent class models using a conservative alpha level (α = .01) to take into account the NLSCY's design effect (i.e., increased risk of falsely rejecting the null hypothesis). Data were weighted according to NLSCY procedures that took into account non-response and post-stratification. All statistical analyses were conducted separately by gender and age.

[1] For a detailed presentation of local maxima problems in latent class analysis, refer to John S. Uebersax's web page (http://ourworld.compuserve.com/homepages/jsuebersax)

4. Results

4.1 Latent Class Models

4.1.1 Latent Class Model of Hyperactivity-Impulsivity

We tested the independence, unrestricted two-class, and unrestricted three-class models for all 10 3-behaviour-item combinations of hyperactivity-impulsivity behaviour items. Results showed that the unrestricted three-class model provided the most acceptable fit to the following 3-behaviour-item combination: Can't sit still, is restless, or hyperactive; Has difficulty awaiting turn in games or groups; and Cannot settle to anything for more than a few moments. The same three behaviour items were chosen for girls and boys. The unrestricted three-class model is a general model that includes many parameters. In cases where the model does not provide an adequate fit to the data for a particular 3-behaviour-item combination, there may be a problem of local dependence which, strictly speaking, indicates that the 3 behaviour items do not measure a single construct (refer to Uebersax's web page).

Girls. Table 4 presents goodness-of-fit statistics for the latent class models that were tested on the chosen 3-behaviour-item combination. The χ^2, L^2, and CR statistics showed that the independence model could be rejected across all age groups ($p < .01$). This suggests that the three hyperactivity-impulsivity behaviour items are not statistically independent of one another. The unrestricted two-class model also could be rejected across all age groups ($p < .01$), suggesting that the hyperactivity-impulsivity data cannot be accounted for by a single latent variable composed of two mutually exclusive and exhaustive latent classes (i.e., hyperactivity-impulsivity and no hyperactivity-impulsivity). The χ^2, L^2, and CR statistics showed an acceptable fit for the unrestricted three-class model across all age groups ($p > .01$), with the exception of 4 year olds. However, there were no standardized residuals with absolute values exceeding 2.58 for this age group, suggesting that observed frequencies did not differ significantly from expected frequencies. In fact, there were no elevated standardized residuals across all age groups for the unrestricted three-class model. In addition, the unrestricted three-class model explained most of the variance in the hyperactivity-impulsivity data (i.e., 1 – [L^2 three-class model / L^2 independence model]).

Boys. Table 5 indicates that the independence and unrestricted two-class models could be rejected across all age groups, according to the χ^2, L^2, and CR statistics. There was an acceptable fit for the unrestricted three-class model across all age groups ($p > .01$), with the exception of 8 and 9 year olds. There were several elevated standardized residuals for 9 year olds, suggesting that observed frequencies differed significantly from expected frequencies (i.e., outliers). For the remaining age groups, there were no standardized residuals with absolute values exceeding 2.58. The unrestricted three-class model also explained most of the variance in the hyperactivity-impulsivity data.

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Table 4
Latent Class Models of Hyperactivity-Impulsivity for 2-11-Year-Old Girls

	2-year-olds										
Model	**X^2**	**p**	**L^2**	**p**	**CR**	**p**	**AIC**	**BIC**	**|Std. Res.| > 1.96**	**|Std. Res.| > 2.58**	**% Explained Variance**
Independence	436.56	.00	257.81	.00	339.23	.00					
Unrestricted two-class	104.60	.00	89.79	.00	97.60	.00	63.7863	1.0895	8	7	65.17
Unrestricted three-class	14.53	.02	15.10	.02	14.68	.02	3.1027	-25.8342	0	0	94.14
	3-year-olds										
Independence	338.16	.00	243.86	.00	286.31	.00					
Unrestricted two-class	43.90	.00	43.69	.00	43.23	.00	17.6864	-44.8708	3	2	82.08
Unrestricted three-class	10.48	.11	11.11	.09	10.52	.10	-0.8892	-29.7617	0	0	95.44
	4-year-olds										
Independence	545.98	.00	365.03	.00	443.83	.00					
Unrestricted two-class	105.15	.00	102.31	.00	103.44	.00	76.3071	13.1141	9	9	71.97
Unrestricted three-class	31.46	.00	32.78	.00	31.76	.00	20.7825	-8.3836	3	0	91.02
	5-year-olds										
Independence	513.30	.00	376.08	.00	432.59	.00					
Unrestricted two-class	67.55	.00	66.66	.00	66.20	.00	40.6567	-21.1586	7	4	82.28
Unrestricted three-class	5.39	.50	4.98	.55	5.22	.52	-7.0243	-35.5544	0	0	98.68
	6-year-olds										
Independence	294.79	.00	201.62	.00	242.51	.00					
Unrestricted two-class	87.12	.00	84.31	.00	85.27	.00	58.3053	-3.0442	7	5	58.18
Unrestricted three-class	4.23	.65	5.10	.53	4.36	.63	-6.9027	-35.2179	0	0	97.47
	7-year-olds										
Independence	410.93	.00	261.03	.00	326.25	.00					
Unrestricted two-class	47.93	.00	50.88	.00	48.11	.00	24.8800	-37.1365	4	2	80.51
Unrestricted three-class	7.25	.30	8.22	.22	7.41	.28	-3.7823	-32.4053	0	0	96.85

Table 4 (Cont'd)
Latent Class Models of Hyperactivity-Impulsivity for 2-11-Year-Old Girls

	8-year-olds										
Independence	465.58	.00	255.08	.00	354.95	.00					
Unrestricted two-class	69.53	.00	66.75	.00	67.02	.00	40.7494	-21.2685	4	4	73.83
Unrestricted three-class	10.94	.09	12.30	.06	11.12	.08	0.2997	-28.3240	0	0	95.18
	9-year-olds										
Independence	560.89	.00	287.12	.00	406.96	.00					
Unrestricted two-class	48.42	.00	56.93	.00	49.84	.00	30.9307	-30.1866	4	3	80.17
Unrestricted three-class	15.06	.02	16.59	.01	15.25	.02	4.5879	-23.6201	0	0	94.22
	10-year-olds										
Independence	599.42	.00	245.71	.00	387.39	.00					
Unrestricted two-class	39.14	.00	39.50	.00	38.77	.00	13.4993	-48.2351	1	1	83.92
Unrestricted three-class	11.76	.07	12.65	.05	11.93	.06	0.6481	-27.8447	0	0	94.85
	11-year-olds										
Independence	646.04	.00	295.40	.00	425.76	.00					
Unrestricted two-class	71.15	.00	50.44	.00	60.60	.00	24.4390	-36.6962	4	1	82.92
Unrestricted three-class	13.12	.04	14.01	.03	13.29	.04	2.0057	-26.2106	0	0	95.26

Note: The latent class models were run for the following 3 behaviour item combination of hyperactivity-impulsivity behaviours: Can't sit still, is restless, or hyperactive; Has difficulty awaiting turn in games or groups; and Cannot settle to anything for more than a few moments. There were 20 degrees of freedom for the independence model, 13 degrees of freedom for the unrestricted two-class model, and 6 degrees of freedom for the unrestricted three-class model.

X2 = Pearson chi-square; L2 = Likelihood-ratio chi-square; CR = Cressie-Read; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; |Std. Res.| = absolute value of standardized residual.

Table 5
Latent Class Models of Hyperactivity-Impulsivity for 2-11-Year-Old Boys

	2-year-olds										
Model	**X^2**	**p**	**L^2**	**p**	**CR**	**p**	**AIC**	**BIC**	**|Std. Res.| > 1.96**	**|Std. Res.| > 2.58**	**% Explained Variance**
Independence	491.40	.00	338.87	.00	408.39	.00					
Unrestricted two-class	76.09	.00	75.45	.00	75.13	.00	49.4528	-13.7538	6	6	77.73
Unrestricted three-class	14.16	.03	15.29	.02	14.36	.03	3.2916	-25.8806	0	0	95.49
	3-year-olds										
Independence	597.39	.00	374.93	.00	477.57	.00					
Unrestricted two-class	160.77	.00	133.81	.00	147.65	.00	107.8073	44.1402	7	5	64.31
Unrestricted three-class	11.09	.09	11.73	.07	11.05	.09	-0.2676	-29.6524	0	0	96.87
	4-year-olds										
Independence	411.19	.00	352.52	.00	380.71	.00					
Unrestricted two-class	36.12	.00	37.48	.00	36.31	.00	11.4837	-51.5809	2	2	89.37
Unrestricted three-class	9.37	.15	9.45	.15	9.39	.15	-2.5515	-31.6582	0	0	97.32
	5-year-olds										
Independence	535.68	.00	347.10	.00	431.78	.00					
Unrestricted two-class	92.98	.00	77.94	.00	85.32	.00	51.9413	-10.2298	4	4	77.55
Unrestricted three-class	12.98	.04	13.48	.04	13.08	.04	1.4765	-27.2178	0	0	96.12
	6-year-olds										
Independence	636.12	.00	435.16	.00	529.41	.00					
Unrestricted two-class	96.11	.00	90.80	.00	93.89	.00	64.8018	1.9235	6	4	79.13
Unrestricted three-class	10.50	.11	9.93	.13	10.22	.12	-2.0671	-31.0878	0	0	97.72
	7-year-olds										
Independence	740.90	.00	406.60	.00	558.43	.00					
Unrestricted two-class	88.74	.00	81.16	.00	84.79	.00	55.1563	-6.2861	3	3	80.04
Unrestricted three-class	2.97	.81	2.91	.82	2.94	.82	-9.0923	-37.4503	0	0	99.28

Table 5 (Cont'd)
Latent Class Models of Hyperactivity-Impulsivity for 2-11-Year-Old Boys

	8-year-olds										
Independence	572.11	.00	400.56	.00	479.73	.00					
Unrestricted two-class	117.05	.00	116.48	.00	116.02	.00	90.4805	28.4032	10	6	70.92
Unrestricted three-class	26.96	.00	26.95	.00	26.83	.00	14.9449	-13.7061	2	0	93.27
	9-year-olds										
Independence	525.68	.00	367.14	.00	436.73	.00					
Unrestricted two-class	110.86	.00	95.82	.00	101.80	.00	69.8187	7.7144	5	4	73.90
Unrestricted three-class	36.74	.00	37.56	.00	35.77	.00	25.5629	-3.1006	2	2	89.77
	10-year-olds										
Independence	705.88	.00	422.92	.00	538.91	.00					
Unrestricted two-class	66.60	.00	66.15	.00	65.95	.00	40.1458	-22.2162	7	2	84.36
Unrestricted three-class	14.92	.02	15.70	.02	15.10	.02	3.7024	-25.0801	0	0	96.29
	11-year-olds										
Independence	400.12	.00	314.47	.00	351.59	.00					
Unrestricted two-class	33.19	.00	30.35	.00	31.62	.00	4.3499	-57.1144	3	1	90.35
Unrestricted three-class	13.48	.04	11.45	.08	12.59	.05	-0.5492	-28.9173	1	0	96.36

Note. The latent class models were run for the following 3-behaviour-item combination of hyperactivity-impulsivity behaviours: *Can't sit still, is restless, or hyperactive*; *Has difficulty awaiting turn in games or groups*; and *Cannot settle to anything for more than a few moments*. There were 20 degrees of freedom for the independence model, 13 degrees of freedom for the unrestricted two-class model, and 6 degrees of freedom for the unrestricted three-class model.

X^2 = Pearson chi-square; L^2 = Likelihood-ratio chi-square; CR = Cressie-Read; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; |Std. Res.| = absolute value of standardized residual.

4.1.2 Latent Class Model of Inattention

We tested the independence, unrestricted two-class, and unrestricted three-class models for the 4 3-behaviour-item combinations of inattention. The unrestricted three-class model showed the most acceptable fit to the following 3-behaviour-item combination: Can't concentrate, can't pay attention for too long; Stares into space; and Is inattentive. The same three behaviour items were chosen for girls and boys.

Girls. Table 6 presents goodness-of-fit statistics for the latent class models that were tested on the chosen 3-behaviour-item combination. The independence model could be rejected across all age groups ($p < .01$). The unrestricted two-class model also could be rejected across all age groups ($p < .01$), with the exception of 5 and 9 year olds. However, for 5 year olds, the L^2 and CR statistics showed an acceptable fit but the χ^2 statistic did not. For 9 year olds, all three statistics showed an acceptable fit. We therefore turned to the AIC and BIC statistics. The AIC suggested that the preferred model was the unrestricted three-class model, compared to the unrestricted two-class model (i.e., the AIC value was more negative for the three-class model). In contrast, the BIC suggested that the unrestricted two-class model was preferable. However, the unrestricted three-class model had no elevated standardized residuals, and it explained most of the variation in the inattention data. The unrestricted three-class model showed an acceptable fit across the χ^2, L^2, and CR statistics ($p > .01$), with the exception of 2, 6, and 8 year olds. However, there was only one standardized residual for 2 year olds whose absolute value exceeded 2.58, and there were no standardized residuals with absolute values exceeding 2.58 for 6 and 8 year olds. In addition, the unrestricted three-class model explained most of the variance in the inattention data.

Boys. Table 7 indicates that the independence and unrestricted two-class models could be rejected across all age groups ($p < .01$). There was an acceptable fit for the unrestricted three-class model across all age groups ($p > .01$), with the exception of 2 year olds. There was one standardized residual whose absolute value exceeded 2.58 for this age group. For the remaining age groups, there were no elevated standardized residuals. The unrestricted three-class model also explained most of the variance in the inattention data.

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Table 6
Latent Class Models of Inattention for 2-11-Year-Old Girls

	2-year-olds										
Model	**X^2**	**p**	**L^2**	**p**	**CR**	**p**	**AIC**	**BIC**	**|Std. Res.| > 1.96**	**|Std. Res.| > 2.58**	**% Explained Variance**
Independence	275.86	.00	212.95	.00	242.37	.00					
Unrestricted two-class	53.13	.00	43.08	.00	47.26	.00	17.0765	-45.8231	3	2	79.77
Unrestricted three-class	29.26	.00	24.31	.00	26.17	.00	12.3089	-16.7217	1	0	88.58
	3-year-olds										
Independence	468.18	.00	235.44	.00	321.58	.00					
Unrestricted two-class	42.26	.00	28.80	.00	35.69	.00	2.8009	-59.8103	1	1	87.77
Unrestricted three-class	4.96	.55	5.58	.47	4.98	.55	-6.4190	-35.3165	0	0	97.63
	4-year-olds										
Independence	1,120.38	.00	336.49	.00	574.89	.00					
Unrestricted two-class	246.17	.00	57.67	.00	134.51	.00	31.6666	-31.5407	3	2	82.86
Unrestricted three-class	9.56	.14	9.55	.15	9.30	.16	-2.4526	-31.6252	0	0	97.16
	5-year-olds										
Independence	286.86	.00	278.25	.00	279.05	.00					
Unrestricted two-class	32.72	.00	24.88	.02	28.35	.01	-1.1243	-62.9212	2	2	91.06
Unrestricted three-class	12.58	.05	12.83	.05	12.23	.06	0.8319	-27.6898	0	0	95.39
	6-year-olds										
Independence	432.23	.00	270.88	.00	320.06	.00					
Unrestricted two-class	83.88	.00	47.43	.00	60.99	.00	21.4267	-39.9090	5	2	82.49
Unrestricted three-class	18.85	.00	19.57	.00	17.94	.01	7.5746	-20.7342	1	0	92.78
	7-year-olds										
Independence	713.68	.00	377.35	.00	503.69	.00					
Unrestricted two-class	95.90	.00	52.91	.00	69.56	.00	26.9064	-35.2021	4	2	85.98
Unrestricted three-class	12.39	.05	15.08	.02	12.79	.05	3.0778	-25.5877	1	0	96.00

Table 6 (Cont'd)
Latent Class Models of Inattention for 2-11-Year-Old Girls

	8-year-olds										
Independence	1,659.48	.00	504.30	.00	897.44	.00					
Unrestricted two-class	109.66	.00	96.03	.00	99.00	.00	70.0288	7.9960	7	5	80.96
Unrestricted three-class	19.68	.00	21.19	.00	19.82	.00	9.1904	-19.4401	1	0	95.80
	9-year-olds										
Independence	456.81	.00	288.99	.00	362.69	.00					
Unrestricted two-class	20.40	.09	20.25	.09	20.01	.09	-5.7527	-66.9759	1	0	92.99
Unrestricted three-class	5.27	.51	4.81	.57	5.03	.54	-7.1873	-35.4442	0	0	98.34
	10-year-olds										
Independence	1,074.23	.00	488.28	.00	713.26	.00					
Unrestricted two-class	90.12	.00	76.94	.00	82.99	.00	50.9406	-10.7994	8	6	84.24
Unrestricted three-class	6.60	.36	7.71	.26	6.78	.34	-4.2940	-32.7894	0	0	98.42
	11-year-olds										
Independence	1,591.37	.00	414.86	.00	749.07	.00					
Unrestricted two-class	167.99	.00	85.15	.00	113.69	.00	59.1516	-1.9922	6	4	79.48
Unrestricted three-class	9.53	.15	11.69	.07	9.80	.13	-0.3139	-28.5341	0	0	97.18

Note: The latent class models were run for the following 3-behaviour-item combination of inattention behaviours: Can't concentrate, can't pay attention for too long; Stares into space; and Is inattentive. There were 20 degrees of freedom for the independence model, 13 degrees of freedom for the unrestricted two-class model, and 6 degrees of freedom for the unrestricted three-class model.

X2 = Pearson chi-square; L2 = Likelihood-ratio chi-square; CR = Cressie-Read; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; |Std. Res.| = absolute value of standardized residual.

Table 7
Latent Class Models of Inattention for 2-11-Year-Old Boys

	2-year-olds										
Model	**X^2**	**p**	**L^2**	**p**	**CR**	**p**	**AIC**	**BIC**	**|Std. Res.| > 1.96**	**|Std. Res.| > 2.58**	**% Explained Variance**
Independence	259.71	.00	194.13	.00	217.03	.00					
Unrestricted two-class	70.58	.00	51.70	.00	59.28	.00	25.6978	-37.5078	6	6	73.37
Unrestricted three-class	27.82	.00	23.02	.00	24.44	.00	11.0196	-18.1522	1	1	88.14
	3-year-olds										
Independence	629.59	.00	263.51	.00	379.12	.00					
Unrestricted two-class	161.25	.00	51.06	.00	92.85	.00	25.0575	-38.7103	4	4	80.62
Unrestricted three-class	11.44	.08	11.56	.07	11.24	.08	-0.4434	-29.8747	0	0	95.61
	4-year-olds										
Independence	2,122.36	.00	253.49	.00	626.69	.00					
Unrestricted two-class	500.12	.00	59.50	.00	188.14	.00	33.5046	-29.5717	4	3	76.53
Unrestricted three-class	12.55	.05	13.66	.03	12.75	.05	1.6595	-27.4526	0	0	94.61
	5-year-olds										
Independence	674.97	.00	282.35	.00	404.26	.00					
Unrestricted two-class	93.75	.00	50.90	.00	69.57	.00	24.8958	-37.3627	5	4	81.97
Unrestricted three-class	14.57	.02	16.86	.01	14.98	.02	4.8558	-23.8788	0	0	94.03
	6-year-olds										
Independence	880.99	.00	468.28	.00	623.90	.00					
Unrestricted two-class	104.51	.00	93.22	.00	95.65	.00	67.2201	4.3418	6	4	80.09
Unrestricted three-class	8.48	.21	8.79	.19	8.40	.21	-3.2128	-32.2336	0	0	98.12
	7-year-olds										
Independence	1,073.62	.00	434.50	.00	662.31	.00					
Unrestricted two-class	144.42	.00	92.55	.00	115.02	.00	66.5471	5.1132	7	7	78.70
Unrestricted three-class	10.72	.10	11.23	.08	10.79	.10	-0.7729	-29.1270	0	0	97.42

Table 7 (Cont'd)
Latent Class Models of Inattention for 2-11-Year-Old Boys

	8-year-olds										
Independence	743.14	.00	523.89	.00	621.30	.00					
Unrestricted two-class	122.81	.00	127.60	.00	122.04	.00	101.5949	39.5176	10	9	75.64
Unrestricted three-class	13.88	.03	13.38	.04	13.50	.04	1.3793	-27.2718	1	0	97.45
	9-year-olds										
Independence	659.94	.00	433.60	.00	520.02	.00					
Unrestricted two-class	74.34	.00	57.20	.00	65.45	.00	31.1975	-30.9090	5	4	86.81
Unrestricted three-class	9.28	.16	11.82	.07	9.72	.14	-0.1760	-28.8405	0	0	97.27
	10-year-olds										
Independence	756.56	.00	444.61	.00	567.61	.00					
Unrestricted two-class	110.44	.00	85.83	.00	95.85	.00	59.8274	-2.5296	5	4	80.70
Unrestricted three-class	10.90	.09	14.63	.02	11.61	.07	2.6333	-26.1469	0	0	96.71
	11-year-olds										
Independence	630.54	.00	491.85	.00	546.18	.00					
Unrestricted two-class	50.14	.00	42.58	.00	45.80	.00	16.5779	-44.9062	3	2	91.34
Unrestricted three-class	8.61	.20	9.39	.15	8.75	.19	-2.6063	-30.9836	0	0	98.09

Note: The latent class models were run for the following 3-behaviour-item combination of inattention behaviours: Can't concentrate, can't pay attention for too long; Stares into space; and Is inattentive. There were 20 degrees of freedom for the independence model, 13 degrees of freedom for the unrestricted two-class model, and 6 degrees of freedom for the unrestricted three-class model.

X2 = Pearson chi-square; L2 = Likelihood-ratio chi-square; CR = Cressie-Read; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; |Std. Res.| = absolute value of standardized residual.

4.1.3 Conclusion

Overall, the results indicated that the unrestricted three-class model provided an adequate fit to the hyperactivity-impulsivity and inattention data for the majority of 2-11-year-old girls and boys. In cases where the unrestricted three-class model did not fit the data for certain age groups, the standardized residuals generally were not large (i.e., absolute values did not exceed 2.58). This suggested that observed frequencies did not differ significantly from expected frequencies and that the model did, in fact, provide an adequate fit to the data.

4.2 Conditional Behaviour Rating Probability Estimates

Tables 8 to 11 present the conditional behaviour rating probability estimates under the unrestricted three-class model. In particular, Tables 8 and 9 contain the hyperactivity-impulsivity parameter estimates for 2-11-year-old girls and boys, respectively. Tables 10 and 11 contain the inattention parameter estimates for 2-11-year-old girls and boys, respectively.

We find that the conditional behaviour rating probability estimates ($\pi_{j(k)|t}$) reveal a clear ordering among the three latent classes. For instance, the odds of being rated in the first category (i.e., *never or not true*) tend to be higher for children who belong to the first latent class than for those who belong to the second latent class. Furthermore, the odds of being rated in the first category tend to be higher for children who belong to the second latent class than for those who belong to the third latent class. To illustrate, consider the odds of being rated in the first category on the third hyperactivity-impulsivity behaviour item (i.e., Cannot settle to anything for more than a few moments) for 2-year-old girls. Here, the odds were (.90/.10) = 9 for girls who belong to the first latent class, compared to (.33/.67) = 0.49 for girls in the second latent class and (.05/.95) = 0.05 for girls in the third latent class (see Table 8). Therefore, the odds of being rated in the first category were (9/0.49) = 18.37 times higher for 2-year-old girls in the first latent class than for those in the second latent class and (0.49/0.05) = 9.8 times higher for 2-year-old girls in the second latent class than for those in the third latent class.

In addition, the odds of being rated in the second category (i.e., *sometimes or somewhat true*) tend to be higher for children who belong to the second latent class than for those who belong to either the first or third latent class. If we continue to focus on the third hyperactivity-impulsivity behaviour item (i.e., Cannot settle to anything for more than a few moments) for 2 -year-old girls, we see that the odds of being rated in the second category were (.65/.35) = 1.86 for girls who belong to the second latent class, compared to (.10/.90) = 0.11 for girls in the first latent class and (.15/.85) = 0.18 for girls in the third latent class (see Table 8). Therefore, the odds of being rated in the second category were (1.86/0.11) = 16.91 times higher for 2-year-old girls in the second latent class than for those in the first latent class and (1.86/0.18) = 10.33 times higher for 2-year-old girls in the second latent class than for those in the third latent class.

Table 8
Conditional Behaviour Rating Probability Estimates Under the Unrestricted Three-Class Model for Hyperactivity-Impulsivity in 2-11-Year-Old Girls

	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years	11 years
First Latent Class (Low Hyperactivity-Impulsivity)										
$\pi_{A(1)}$	.56 (.06)	.51 (.05)	.76 (.11)	.66 (.04)	.65 (.05)	.65 (.03)	.68 (.03)	.66 (.06)	.77 (.07)	.82 (.07)
$\pi_{A(2)}$	.44 (.06)	.43 (.05)	.16 (.14)	.34 (.04)	.31 (.04)	.33 (.03)	.22 (.02)	.27 (.06)	.14 (.08)	.13 (.07)
$\pi_{A(3)}$	.00 (.00)	.06 (.01)	.08 (.05)	.00 (.00)	.04 (.05)	.02 (.02)	.10 (.02)	.07 (.02)	.09 (.03)	.05 (.02)
$\pi_{B(1)}$	.56 (.05)	.45 (.03)	.66 (.07)	.54 (.03)	.64 (.05)	.66 (.03)	.74 (.02)	.75 (.05)	.77 (.05)	.84 (.03)
$\pi_{B(2)}$	.36 (.04)	.49 (.03)	.33 (.06)	.39 (.03)	.32 (.05)	.31 (.03)	.23 (.02)	.23 (.05)	.20 (.05)	.13 (.03)
$\pi_{B(3)}$	.08 (.03)	.06 (.02)	.01 (.03)	.07 (.01)	.04 (.02)	.03 (.01)	.03 (.01)	.02 (.01)	.03 (.01)	.03 (.01)
$\pi_{C(1)}$	.90 (.06)	.85 (.04)	.86 (.05)	.97 (.03)	.93 (.04)	.90 (.03)	.85 (.02)	.96 (.02)	.99 (.04)	.98 (.03)
$\pi_{C(2)}$	.10 (.06)	.14 (.04)	.14 (.05)	.03 (.03)	.07 (.04)	.10 (.03)	.13 (.02)	.04 (.02)	.01 (.05)	.02 (.03)
$\pi_{C(3)}$	.00 (.00)	.01 (.01)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.02 (.01)	.00 (.00)	.00 (.00)	.00 (.00)
Second Latent Class (Medium Hyperactivity-Impulsivity)										
$\pi_{A(1)}$	.13 (.04)	.03 (.06)	.23 (.11)	.14 (.05)	.28 (.05)	.16 (.08)	.00 (.00)	.17 (.10)	.40 (.15)	.23 (.10)
$\pi_{A(2)}$	.70 (.04)	.77 (.05)	.71 (.10)	.72 (.07)	.54 (.04)	.70 (.10)	.82 (.08)	.69 (.11)	.56 (.14)	.68 (.08)
$\pi_{A(3)}$	.17 (.04)	.20 (.06)	.06 (.15)	.14 (.08)	.18 (.03)	.14 (.10)	.18 (.08)	.14 (.14)	.04 (.07)	.09 (.09)
$\pi_{B(1)}$	.26 (.03)	.20 (.04)	.23 (.10)	.22 (.04)	.18 (.06)	.21 (.09)	.12 (.08)	.34 (.10)	.46 (.12)	.56 (.09)
$\pi_{B(2)}$	.52 (.03)	.55 (.06)	.63 (.08)	.65 (.05)	.69 (.05)	.77 (.10)	.80 (.08)	.66 (.16)	.51 (.11)	.44 (.09)
$\pi_{B(3)}$	.21 (.03)	.25 (.07)	.14 (.03)	.13 (.03)	.13 (.03)	.02 (.03)	.08 (.03)	.00 (.00)	.03 (.03)	.00 (.00)
$\pi_{C(1)}$	.33 (.07)	.23 (.16)	.60 (.07)	.18 (.15)	.44 (.08)	.20 (.19)	.44 (.07)	.44 (.29)	.69 (.12)	.59 (.10)
$\pi_{C(2)}$	.65 (.07)	.77 (.16)	.40 (.07)	.82 (.15)	.55 (.08)	.80 (.19)	.56 (.07)	.56 (.29)	.31 (.12)	.41 (.10)
$\pi_{C(3)}$	.02 (.01)	.00 (.00)	.00 (.00)	.00 (.00)	.01 (.01)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Third Latent Class (High Hyperactivity-Impulsivity)										
$\pi_{A(1)}$	.17 (.07)	.00 (.00)	.01 (.01)	.00 (.00)	.00 (.00)	.00 (.00)	.11 (.09)	.09 (.04)	.00 (.00)	.01 (.02)
$\pi_{A(2)}$	.04 (.07)	.53 (.08)	.13 (.04)	.14 (.05)	.11 (.09)	.18 (.08)	.06 (.06)	.20 (.11)	.30 (.10)	.32 (.07)
$\pi_{A(3)}$	.79 (.09)	.47 (.08)	.86 (.04)	.86 (.05)	.89 (.09)	.82 (.08)	.83 (.11)	.71 (.12)	.70 (.10)	.67 (.08)
$\pi_{B(1)}$	.33 (.08)	.15 (.06)	.16 (.04)	.11 (.04)	.48 (.09)	.26 (.08)	.21 (.07)	.16 (.06)	.21 (.06)	.30 (.07)
$\pi_{B(2)}$	.07 (.06)	.21 (.06)	.50 (.09)	.49 (.06)	.23 (.08)	.39 (.07)	.35 (.09)	.33 (.15)	.43 (.08)	.46 (.09)
$\pi_{B(3)}$	.60 (.09)	.64 (.07)	.34 (.07)	.40 (.07)	.29 (.08)	.35 (.09)	.44 (.09)	.51 (.15)	.36 (.08)	.24 (.08)
$\pi_{C(1)}$	.05 (.13)	.20 (.19)	.12 (.14)	.36 (.07)	.53 (.14)	.41 (.09)	.14 (.11)	.20 (.10)	.09 (.09)	.12 (.10)
$\pi_{C(2)}$	.15 (.19)	.12 (.35)	.50 (.05)	.35 (.10)	.00 (.00)	.36 (.10)	.43 (.08)	.43 (.12)	.64 (.08)	.62 (.08)
$\pi_{C(3)}$	.80 (.23)	.68 (.34)	.38 (.16)	.29 (.07)	.47 (.14)	.23 (.07)	.43 (.11)	.37 (.09)	.27 (.08)	.26 (.09)

Note: Standard errors are in parentheses. Behaviour A refers to Can't sit still, is restless, or hyperactive. Behaviour B refers to Has difficulty awaiting turn in games or groups. Behaviour C refers to Cannot settle to anything for more than a few moments. For example, pA(1) refers to the probability of a rating never or not true to behaviour A. Conditional behaviour rating probabilities for a specific behaviour sum to 1 across latent

Table 9
Conditional Behaviour Rating Probability Estimates Under the Unrestricted Three-Class Model for Hyperactivity-Impulsivity in 2-11-Year-Old Boys

	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years	11 years
First Latent Class (Low Hyperactivity-Impulsivity										
$\pi_{A(1)}$	.65 (.09)	.49 (.06)	.58 (.06)	.56 (.05)	.64 (.07)	.54 (.03)	.59 (.05)	.68 (.05)	.76 (.08)	.88 (.10)
$\pi_{A(2)}$	.35 (.09)	.48 (.05)	.34 (.05)	.39 (.04)	.23 (.07)	.38 (.03)	.36 (.04)	.27 (.04)	.19 (.08)	.12 (.10)
$\pi_{A(3)}$	.00 (.00)	.03 (.03)	.08 (.03)	.05 (.02)	.13 (.03)	.08 (.02)	.05 (.03)	.05 (.02)	.05 (.03)	.00 (.00)
$\pi_{B(1)}$	.52 (.05)	.45 (.04)	.46 (.04)	.51 (.03)	.67 (.05)	.60 (.03)	.67 (.04)	.66 (.03)	.74 (.04)	.77 (.03)
$\pi_{B(2)}$	.45 (.04)	.44 (.03)	.48 (.04)	.42 (.03)	.29 (.04)	.36 (.03)	.29 (.03)	.31 (.03)	.24 (.04)	.21 (.03)
$\pi_{B(3)}$	.03 (.02)	.11 (.02)	.06 (.02)	.07 (.02)	.04 (.02)	.04 (.01)	.04 (.02)	.03 (.01)	.02 (.01)	.02 (.01)
$\pi_{C(1)}$	.82 (.04)	.99 (.01)	.83 (.04)	.91 (.03)	.95 (.03)	.83 (.03)	.99 (.04)	.90 (.03)	1.00 (.00)	.95 (.03)
$\pi_{C(2)}$	.18 (.05)	.00 (.00)	.16 (.04)	.09 (.03)	.05 (.03)	.15 (.03)	.01 (.04)	.06 (.03)	.00 (.00)	.04 (.03)
$\pi_{C(3)}$	.00 (.00)	.01 (.01)	.01 (.01)	.00 (.00)	.00 (.00)	.02 (.01)	.00 (.00)	.04 (.01)	.00 (.00)	.01 (.01)
Second Latent Class (Medium Hyperactivity-Impulsivity)										
$\pi_{A(1)}$	.01 (.07)	.08 (.01)	.02 (.04)	.03 (.04)	.12 (.05)	.01 (.05)	.16 (.04)	.05 (.04)	.26 (.05)	.16 (.15)
$\pi_{A(2)}$	.84 (.08)	.70 (.03)	.58 (.08)	.73 (.05)	.78 (.07)	.61 (.06)	.51 (.04)	.62 (.05)	.67 (.05)	.84 (.15)
$\pi_{A(3)}$	.15 (.05)	.22 (.03)	.40 (.10)	.24 (.05)	.10 (.05)	.38 (.06)	.33 (.05)	.33 (.05)	.07 (.06)	.00 (.00)
$\pi_{B(1)}$	.21 (.05)	.22 (.02)	.11 (.04)	.16 (.04)	.25 (.05)	.10 (.05)	.27 (.04)	.28 (.04)	.43 (.05)	.48 (.08)
$\pi_{B(2)}$	.63 (.05)	.60 (.03)	.60 (.05)	.76 (.06)	.66 (.06)	.80 (.06)	.55 (.04)	.66 (.04)	.52 (.04)	.46 (.07)
$\pi_{B(3)}$	.16 (.04)	.18 (.02)	.29 (.06)	.08 (.04)	.09 (.02)	.10 (.04)	.18 (.03)	.06 (.02)	.05 (.02)	.06 (.02)
$\pi_{C(1)}$	.44 (.07)	.25 (.09)	.26 (.11)	.25 (.09)	.59 (.05)	.20 (.08)	.38 (.07)	.38 (.06)	.60 (.08)	.62 (.09)
$\pi_{C(2)}$	.56 (.07)	.74 (.09)	.74 (.11)	.75 (.09)	.39 (.05)	.80 (.08)	.61 (.07)	.62 (.06)	.39 (.08)	.38 (.09)
$\pi_{C(3)}$	.00 (.00)	.01 (.02)	.00 (.00)	.00 (.00)	.02 (.02)	.00 (.00)	.01 (.02)	.00 (.00)	.01 (.01)	.00 (.00)
Third Latent Class (High Hyperactivity-Impulsivity)										
$\pi_{A(1)}$	.05 (.03)	.02 (.03)	.02 (.02)	.02 (.02)	.00 (.00)	.04 (.04)	.09 (.09)	.00 (.00)	.00 (.00)	.05 (.06)
$\pi_{A(2)}$	.27 (.06)	.13 (.06)	.22 (.05)	.27 (.07)	.21 (.06)	.07 (.04)	.07 (.04)	.12 (.06)	.17 (.06)	.23 (.08)
$\pi_{A(3)}$	.68 (.06)	.85 (.07)	.76 (.06)	.71 (.08)	.79 (.06)	.89 (.05)	.84 (.06)	.88 (.06)	.83 (.06)	.72 (.10)
$\pi_{B(1)}$	.26 (.04)	.17 (.05)	.11 (.04)	.18 (.07)	.22 (.04)	.06 (.04)	.26 (.05)	.12 (.06)	.32 (.04)	.31 (.04)
$\pi_{B(2)}$	.22 (.05)	.20 (.06)	.44 (.06)	.27 (.06)	.31 (.04)	.25 (.06)	.25 (.05)	.34 (.08)	.36 (.05)	.56 (.04)
$\pi_{B(3)}$	.52 (.06)	.63 (.07)	.45 (.06)	.55 (.08)	.47 (.05)	.69 (.07)	.49 (.06)	.54 (.08)	.32 (.05)	.13 (.02)
$\pi_{C(1)}$	.21 (.05)	.13 (.07)	.00 (.00)	.27 (.07)	.08 (.04)	.11 (.05)	.00 (.00)	.19 (.07)	.05 (.05)	.32 (.04)
$\pi_{C(2)}$	.45 (.06)	.12 (.11)	.35 (.39)	.38 (.09)	.44 (.05)	.36 (.08)	.08 (.15)	.35 (.10)	.60 (.05)	.54 (.04)
$\pi_{C(3)}$	.34 (.06)	.75 (.12)	.65 (.39)	.35 (.09)	.48 (.06)	.53 (.08)	.92 (.15)	.46 (.10)	.35 (.06)	.14 (.03)

Note: Standard errors are in parentheses. Behaviour A refers to Can't sit still, is restless, or hyperactive. Behaviour B refers to Has difficulty awaiting turn in games or groups. Behaviour C refers to Cannot settle to anything for more than a few moments. For example, pA(1) refers to the probability of a rating never or not true to behaviour A. Conditional behaviour rating probabilities for a specific behaviour sum to 1 across latent classes and are conditional on latent class membership.

Table 10
Conditional Behaviour Rating Probability Estimates Under the Unrestricted Three-Class Model for Inattention in 2-11-Year-Old Girls

	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years	11 years
First Latent Class (Low Inattention)										
$\pi_{A(1)}$	.97 (.01)	.82 (.09)	.76 (.02)	.85 (.02)	.98 (.01)	.85 (.02)	.90 (.02)	.85 (.04)	.94 (.03)	.98 (.03)
$\pi_{A(2)}$	.00 (.00)	.17 (.09)	.23 (.02)	.14 (.02)	.00 (.00)	.15 (.02)	.10 (.02)	.14 (.04)	.05 (.03)	.01 (.03)
$\pi_{A(3)}$	.03 (.01)	.01 (.01)	.01 (.00)	.01 (.00)	.02 (.01)	.00 (.00)	.00 (.00)	.01 (.00)	.01 (.00)	.01 (.00)
$\pi_{B(1)}$	.90 (.02)	.91 (.02)	.90 (.01)	.88 (.02)	.86 (.02)	.91 (.02)	.89 (.02)	.88 (.02)	.83 (.02)	.83 (.02)
$\pi_{B(2)}$	.10 (.02)	.09 (.02)	.10 (.01)	.12 (.02)	.13 (.02)	.07 (.02)	.11 (.02)	.12 (.02)	.16 (.02)	.17 (.02)
$\pi_{B(3)}$	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.01 (.00)	.02 (.01)	.00 (.00)	.00 (.00)	.01 (.01)	.00 (.00)
$\pi_{C(1)}$	.97 (.09)	.88 (.05)	.99 (.01)	.99 (.01)	.85 (.02)	.97 (.03)	.87 (.02)	1.00 (.00)	.91 (.03)	.90 (.03)
$\pi_{C(2)}$	.03 (.09)	.12 (.05)	.00 (.00)	.00 (.00)	.15 (.02)	.01 (.03)	.13 (.02)	.00 (.00)	.09 (.03)	.09 (.03)
$\pi_{C(3)}$	.00 (.00)	.00 (.00)	.01 (.00)	.01 (.01)	.00 (.00)	.02 (.01)	.00 (.00)	.00 (.00)	.00 (.00)	.01 (.00)
Second Latent Class (Medium Inattention)										
$\pi_{A(1)}$	.22 (.20)	.12 (.10)	.26 (.02)	.31 (.03)	.00 (.00)	.31 (.05)	.14 (.05)	.52 (.05)	.23 (.07)	.24 (.08)
$\pi_{A(2)}$	.78 (.20)	.88 (.10)	.70 (.03)	.60 (.03)	.94 (.03)	.69 (.05)	.72 (.05)	.48 (.05)	.77 (.07)	.76 (.08)
$\pi_{A(3)}$	.00 (.00)	.00 (.00)	.04 (.01)	.09 (.02)	.06 (.03)	.00 (.00)	.14 (.03)	.00 (.00)	.00 (.00)	.00 (.00)
$\pi_{B(1)}$	.86 (.03)	.81 (.03)	.78 (.02)	.70 (.03)	.64 (.03)	.52 (.04)	.43 (.04)	.73 (.04)	.52 (.04)	.48 (.05)
$\pi_{B(2)}$	.12 (.02)	.19 (.03)	.22 (.02)	.30 (.03)	.32 (.03)	.46 (.04)	.56 (.04)	.27 (.04)	.46 (.04)	.52 (.05)
$\pi_{B(3)}$	.02 (.01)	.00 (.00)	.00 (.00)	.00 (.00)	.04 (.01)	.02 (.01)	.01 (.01)	.00 (.00)	.02 (.02)	.00 (.00)
$\pi_{C(1)}$	.65 (.06)	.33 (.12)	.00 (.00)	.00 (.00)	.39 (.03)	.24 (.06)	.21 (.05)	.20 (.23)	.20 (.07)	.28 (.06)
$\pi_{C(2)}$	.35 (.06)	.64 (.12)	.99 (.01)	.97 (.01)	.61 (.03)	.73 (.06)	.79 (.05)	.80 (.23)	.76 (.06)	.72 (.06)
$\pi_{C(3)}$	.00 (.00)	.03 (.01)	.01 (.01)	.03 (.01)	.00 (.00)	.03 (.01)	.00 (.00)	.00 (.00)	.04 (.02)	.00 (.00)
Third Latent Class (High Inattention)										
$\pi_{A(1)}$	.32 (.08)	.00 (.00)	.02 (.10)	.37 (.18)	.56 (.16)	.07 (18)	.02 (.03)	.07 (.05)	.00 (.00)	.24 (.09)
$\pi_{A(2)}$	.48 (.08)	.16 (.27)	.00 (.00)	.46 (.16)	.17 (.15)	.00 (.00)	.34 (.09)	.59 (.08)	.17 (.15)	.11 (.06)
$\pi_{A(3)}$	.20 (.06)	.84 (.27)	.98 (.10)	.17 (.11)	.27 (.11)	.93 (.18)	.64 (.09)	.34 (.08)	.83 (.15)	.65 (.10)
$\pi_{B(1)}$	.56 (.08)	.58 (.10)	.02 (.08)	.00 (.00)	.22 (.15)	.41 (.09)	.18 (.07)	.36 (.08)	.26 (.07)	.15 (.07)
$\pi_{B(2)}$	.43 (.08)	.23 (.08)	.84 (.13)	.58 (.21)	.73 (.14)	.30 (.09)	.32 (.09)	.47 (.08)	.36 (.07)	.48 (.08)
$\pi_{B(3)}$	.01 (.01)	.19 (.08)	.14 (.11)	.42 (.21)	.05 (.05)	.29 (.09)	.50 (.09)	.18 (.05)	.38 (.08)	.37 (.08)
$\pi_{C(1)}$	.00 (.00)	.07 (.10)	.00 (.00)	1.00 (.00)	.00 (.00)	.00 (.00)	.06 (.06)	.00 (.00)	.00 (.00)	.00 (.00)
$\pi_{C(2)}$	.92 (.03)	.78 (.10)	.27 (.17)	.00 (.00)	.57 (.18)	.82 (.07)	.07 (.11)	.84 (.05)	.55 (.07)	.70 (.08)
$\pi_{C(3)}$	.08 (.03)	.15 (.07)	.73 (.17)	.00 (.00)	.43 (.18)	.18 (.07)	.87 (.12)	.16 (.05)	.45 (.07)	.30 (.08)

Note: Standard errors are in parentheses. Behaviour A refers to Can't concentrate, can't pay attention for too long. Behaviour B refers to Stares into space. Behaviour C refers to Is inattentive. For example, pA(1) refers to the probability of a rating never or not true to behaviour A. Conditional behaviour rating probabilities for a specific behaviour sum to 1 across latent classes and are conditional on latent class membership.

Table 11
Conditional Behaviour Rating Probability Estimates Under the Unrestricted Three-Class Model for Inattention in 2-11-Year-Old Boys

	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years	11 years
First Latent Class (Low Inattention)										
$\pi_{A(1)}$	.86 (.19)	.67 (.04)	.84 (.06)	.79 (.10)	.91 (.06)	.81 (.03)	.86 (.04)	.83 (.04)	.87 (.04)	.95 (.06)
$\pi_{A(2)}$	.13 (.18)	.29 (.04)	.16 (.06)	.20 (.08)	.08 (.06)	.17 (.03)	.11 (.04)	.17 (.04)	.12 (.04)	.05 (.06)
$\pi_{A(3)}$	.01 (.02)	.04 (.01)	.00 (.00)	.00 (.00)	.02 (.02)	.02 (.01)	.03 (.01)	.00 (.00)	.01 (.01)	.00 (.00)
$\pi_{B(1)}$	.94 (.02)	.92 (.02)	.92 (.02)	.87 (.02)	.90 (.02)	.91 (.02)	.90 (.02)	.88 (.02)	.90 (.02)	.91 (.02)
$\pi_{B(2)}$	.06 (.02)	.08 (.02)	.08 (.02)	.13 (.02)	.10 (.02)	.08 (.02)	.10 (.02)	.12 (.02)	.09 (.02)	.09 (.02)
$\pi_{B(3)}$	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.01 (.00)	.00 (.00)	.00 (.00)	.01 (.01)	.00 (.00)
$\pi_{C(1)}$	1.00 (.00)	.81 (.05)	.99 (.01)	.99 (.01)	.85 (.03)	.83 (.03)	.94 (.04)	.88 (.04)	.86 (.03)	.94 (.06)
$\pi_{C(2)}$	.00 (.00)	.18 (.05)	.00 (.00)	.00 (.00)	.13 (.03)	.17 (.03)	.06 (.04)	.12 (.04)	.14 (.03)	.06 (.06)
$\pi_{C(3)}$	.00 (.00)	.01 (.01)	.01 (.01)	.01 (.01)	.02 (.01)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Second Latent Class (Medium Inattention)										
$\pi_{A(1)}$	.17 (.08)	.12 (.06)	.30 (.02)	.31 (.03)	.02 (.09)	.13 (.05)	.23 (.05)	.16 (.06)	.15 (.05)	.26 (.10)
$\pi_{A(2)}$	.78 (.10)	.78 (.07)	.63 (.02)	.61 (.03)	.95 (.16)	.70 (.04)	.77 (.05)	.75 (.06)	.78 (.06)	.73 (.09)
$\pi_{A(3)}$	.05 (.03)	.10 (.05)	.07 (.01)	.08 (.03)	.03 (.13)	.17 (.03)	.00 (.00)	.09 (.05)	.07 (.06)	.01 (.05)
$\pi_{B(1)}$	.85 (.03)	.71 (.04)	.78 (.02)	.75 (.03)	.71 (.04)	.54 (.04)	.59 (.04)	.60 (.05)	.57 (.04)	.67 (.06)
$\pi_{B(2)}$	.14 (.03)	.27 (.04)	.22 (.02)	.24 (.03)	.29 (.04)	.45 (.04)	.40 (.04)	.38 (.04)	.41 (.04)	.31 (.06)
$\pi_{B(3)}$	.01 (.01)	.01 (.01)	.00 (.00)	.01 (.01)	.00 (.00)	.01 (.01)	.01 (.01)	.02 (.01)	.02 (.01)	.00 (.00)
$\pi_{C(1)}$	.39 (.13)	.05 (.08)	.28 (.07)	.13 (.24)	.30 (.09)	.11 (.05)	.24 (.06)	.08 (.12)	.23 (.05)	.21 (.10)
$\pi_{C(2)}$	.61 (.13)	.93 (.08)	.70 (.07)	.83 (.22)	.70 (.09)	.89 (.05)	.76 (.06)	.92 (.12)	.74 (.05)	.79 (.10)
$\pi_{C(3)}$	.00 (.00)	.02 (.01)	.02 (.01)	.04 (.04)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.03 (.02)	.00 (.00)
Third Latent Class (High Inattention)										
$\pi_{A(1)}$	.61 (.10)	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)	.04 (.05)	.01 (.01)	.00 (.00)	.00 (.00)	.00 (.00)
$\pi_{A(2)}$	.11 (.08)	.00 (.00)	.06 (.16)	.44 (.24)	.14 (.05)	.22 (.06)	.24 (.05)	.42 (.08)	.10 (.14)	.64 (.06)
$\pi_{A(3)}$	.28 (.09)	1.00 (.00)	.94 (.16)	.56 (.24)	.86 (.06)	.74 (.08)	.75 (.05)	.58 (.08)	.90 (.14)	.36 (.06)
$\pi_{B(1)}$	.62 (.10)	.88 (.07)	.43 (.17)	.39 (.30)	.52 (.10)	.36 (.08)	.49 (.05)	.30 (.06)	.41 (.09)	.35 (.08)
$\pi_{B(2)}$	.36 (.10)	.00 (.00)	.22 (.14)	.29 (.24)	.30 (.06)	.36 (.08)	.32 (.05)	.58 (.06)	.37 (.08)	.50 (.06)
$\pi_{B(3)}$	.02 (.02)	.12 (.07)	.35 (.17)	.32 (.18)	.18 (.07)	.28 (.07)	.19 (.04)	.12 (.04)	.22 (.08)	.15 (.05)
$\pi_{C(1)}$	.00 (.00)	.00 (.00)	.00 (.00)	.14 (.20)	.09 (.05)	.12 (.11)	.05 (.04)	.30 (.09)	.10 (.06)	.15 (.06)
$\pi_{C(2)}$	.85 (.08)	.66 (.17)	.10 (.21)	.35 (.17)	.54 (.13)	.05 (.11)	.47 (.05)	.36 (.12)	.42 (.15)	.63 (.07)
$\pi_{C(3)}$	.15 (.08)	.34 (.17)	.90 (.21)	.51 (.26)	.37 (.14)	.83 (.15)	.48 (.05)	.34 (.09)	.48 (.16)	.22 (.07)

Note: Standard errors are in parentheses. Behaviour A refers to Can't concentrate, can't pay attention for too long. Behaviour B refers to Stares into space. Behaviour C refers to Is inattentive. For example, pA(1) refers to the probability of a rating never or not true to behaviour A. Conditional behaviour rating probabilities for a specific behaviour sum to 1 across latent classes and are conditional on latent class membership.

Finally, the odds of being rated in the third category (i.e., *often or very true*) tend to be higher for children who belong to the third latent class than for those who belong to the second latent class. Furthermore, the odds of being rated in the third category tend to be higher for children who belong to the second latent class than for those who belong to the first latent class. If we consider the odds of being rated in the third category on the third hyperactivity-impulsivity behaviour item (i.e., Cannot settle to anything for more than a few moments) for 2-year-old girls, we find that the odds were (.80/.20) = 4 for girls who belong to the third latent class, compared to (.02/.98) = 0.02 for girls in the second latent class and (.001/.999) = 0.001 for girls in the first latent class (see Table 8). Therefore, the odds of being rated in the third category were (4/0.02) = 200 times higher for 2-year-old girls in the third latent class than for those in the second latent class and (.02/0.001) = 20 times higher for 2-year-old girls in the second latent class than for those in the first latent class.

4.2.1 Conclusion

The conditional behaviour rating probability estimates indicated a clear ordering of the latent classes under the unrestricted three-class model. The first latent class (i.e., low) includes children who do *not* tend to manifest hyperactive-impulsive and inattentive behaviours. The second latent class (i.e., medium) includes children who tend *somewhat* to manifest hyperactive-impulsive and inattentive behaviours. The third latent class (i.e., high) includes children who tend *often* to manifest hyperactive-impulsive and inattentive behaviours.

4.3 Latent Class Probability Estimates

4.3.1 Hyperactivity-Impulsivity

Table 12 presents the latent class probability estimates under the unrestricted three-class model for 2-11-year-old girls. In general, a majority of girls were estimated to belong to the low hyperactivity-impulsivity latent class. These latent class probability estimates ranged from 37% for 4 year olds to 75% for 8 year olds. In contrast, the percentage of girls estimated to belong to the high hyperactivity-impulsivity latent class was much lower, and the latent class probability estimates ranged from 5% for 2 year olds to 17% for 4 year olds. Results for 4 year olds should be interpreted with caution as the unrestricted three-class model did not fit the data for this age group. Additionally, the coefficients of variation, determined by dividing the standard error of the estimate by the estimate, were marginal to unacceptable for most of the medium and high latent classes. A high level of error, therefore, was associated with these estimates.

The latent class probability estimates under the unrestricted three-class model for 2-11-year-old boys are shown in Table 13. Most boys were estimated to belong to either the low or medium latent class. Latent class probability estimates for the low latent class ranged from 38% for 6 year olds to 65% for 7 year olds. Estimates for the medium latent class ranged from 23% for 7 year olds to 50% for 3 year olds. The percentage of boys estimated to belong to the high hyperactivity-impulsivity latent class was lower, and the latent class probability estimates ranged from 9% for 9 year olds to 23% for 11 year olds. It should be noted that the unrestricted three-class model did not fit the data for 8 and 9-year-old boys. Furthermore, the coefficients of variation were marginal for most of the high latent classes.

Table 12
Latent Class Probability Estimates Under the Unrestricted Three-Class Model for Hyperactivity-Impulsivity in 2-11-Year-Old Girls

	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years	11 years
Low Hyperactivity-Impulsivity										
π	.45*	.63	.37**	.59	.51	.73	.75	.72	.58*	.56*
SE	.09	.08	.13	.05	.08	.05	.03	.11	.19	.10
99% CI	.22-.68	.42-.84	.03-.71	.46-.72	.30-.72	.60-.86	.67-.83	.44-1.00	.09-1.07	.30-.82
Medium Hyperactivity-Impulsivity										
π	.50*	.29*	.46*	.26*	.40*	.15**	.16*	.18**	.33**	.33*
SE	.09	.08	.10	.06	.08	.06	.03	.10	.18	.09
99% CI	.27-.73	.08-.50	.20-.72	.11-.41	.19-.61	.00-.30	.08-.24	-.08-.44	-.13-.79	.10-.56
High Hyperactivity-Impulsivity										
π	.05**	.08**	.17**	.15*	.09*	.12*	.09*	.10*	.09*	.11*
SE	.02	.04	.07	.03	.03	.03	.02	.02	.02	.03
99% CI	.00-.10	-.02-.18	-.01-.35	.07-.23	.01-.17	.04-.20	.04-.14	.05-.15	.04-.14	.03-.19

Note: π refers to the probability of being a member of a given latent class. Results for 4 year olds should be interpreted with caution.
SE = standard error. CI = confidence interval.
*Coefficient of variation between 16.6% and 33.3%; **Coefficient of variation greater than 33.3%

Table 13
Latent Class Probability Estimates Under the Unrestricted Three-Class Model for Hyperactivity-Impulsivity in 2-11-Year-Old Boys

	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years	11 years
Low Hyperactivity-Impulsivity										
π	.39*	.40	.51	.55	.38*	.65	.43	.54	.40*	.48*
SE	.07	.06	.07	.05	.07	.04	.06	.05	.07	.09
99% CI	.21-.57	.25-.55	.33-.69	.42-.68	.20-.56	.55-.75	.28-.58	.41-.67	.22-.58	.25-.71
Medium Hyperactivity-Impulsivity										
π	.39*	.50	.38	.30*	.40*	.23*	.46	.37	.42	.29**
SE	.08	.06	.06	.06	.07	.05	.06	.05	.06	.10
99% CI	.18-.60	.35-.65	.23-.53	.15-.45	.22-.58	.10-.36	.31-.61	.24-.50	.27-.57	.03-.55
High Hyperactivity-Impulsivity										
π	.22*	.10*	.11**	.15*	.22	.12*	.11*	.09*	.18*	.23
SE	.04	.02	.07	.04	.03	.02	.02	.02	.03	.03
99% CI	.12-.32	.05-.15	-.07-.29	.05-.25	.14-.30	.07-.17	.06-.16	.04-.14	.10-.26	.15-.31

Note: π refers to the probability of being a member of a given latent class. Results for 8 and 9 year olds should be interpreted with caution.
SE = standard error. CI = confidence interval.
*Coefficient of variation between 16.6% and 33.3%; **Coefficient of variation greater than 33.3%

4.3.2 Inattention

Table 14 presents the latent class probability estimates under the unrestricted three-class model for 2-11-year-old girls. In general, a majority of girls were estimated to belong to the low inattention latent class, with latent class probability estimates ranging from 40% for 2 year olds to 72% for 8 year olds. In contrast, the percentage of girls estimated to belong to the high inattention latent class was much lower, and estimates ranged from 1% for 4 year olds to 18% for 2 year olds. Results for 2, 6, and 8 year olds should be interpreted with caution as the three-class model did not fit the data for these age groups. Also, the coefficients of variation were marginal to unacceptable for most of the high inattention latent classes.

The latent class probability estimates under the unrestricted three-class model for 2-11-year-old boys are shown in Table 15. In general, most boys were estimated to belong to the low latent class, and latent class probability estimates ranged from 38% for 2 year olds to 62% for 3 and 6 year olds. The percentage of boys estimated to belong to the high inattention latent class was much lower, and estimates ranged from 1% for 4 year olds to 14% for 8 year olds. It should be noted that the unrestricted three-class model did not fit the data for 2-year-old boys. Furthermore, the coefficients of variation were marginal to unacceptable for most of the high latent classes.

Table 14
Latent Class Probability Estimates Under the Unrestricted Three-Class Model for Inattention in 2-11-Year-Old Girls

	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years	11 years
Low Inattention										
π	.40*	.60*	.64	.67	.63	.63	.72	.63	.66	.65
SE	.11	.10	.02	.02	.02	.04	.03	.08	.04	.04
99% CI	.12-.68	.34-.86	.59-.69	.62-.72	.58-.68	.53-.73	.64-.80	.42-.84	.56-.76	.55-.75
Medium Inattention										
π	.42*	.36*	.35	.31	.33	.33	.24	.27*	.28	.29
SE	.13	.10	.02	.02	.02	.04	.03	.08	.04	.04
99% CI	.08-.76	.10-.62	.30-.40	.26-.36	.28-.38	.23-.43	.16-.32	.06-.48	.18-.38	.19-.39
High Inattention										
π	.18*	.04**	.01**	.02**	.04**	.04*	.04*	.10*	.06*	.06*
SE	.05	.02	.01	.01	.02	.01	.01	.02	.01	.01
99% CI	.05-.31	-.01-.09	-.02-.04	-.01-.05	-.01-.09	.01-.07	.01-.07	.05-.15	.03-.09	.03-.09

Note: π refers to the probability of being a member of a given latent class. Results for 2, 6, and 8 year olds should be interpreted with caution.
SE = standard error. CI = confidence interval.
*Coefficient of variation between 16.6% and 33.3%; **Coefficient of variation greater than 33.3%

Table 15
Latent Class Probability Estimates Under the Unrestricted Three-Class Model for Inattention in 2-11-Year-Old Boys

	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years	11 years
Low Inattention										
π	.38*	.62	.45	.54*	.62	.61	.49	.57	.51	.48
SE	.10	.06	.05	.11	.05	.04	.05	.04	.04	.07
99% CI	.12-.64	.47-.77	.32-.58	.26-.82	.49-.75	.51-.71	.36-.62	.47-.67	.41-.61	.30-.66
Medium Inattention										
π	.51*	.34*	.54	.42*	.28*	.33	.37	.30*	.41	.34*
SE	.11	.07	.05	.12	.06	.04	.05	.05	.05	.08
99% CI	.23-.79	.16-.52	.41-.67	.11-.73	.13-.43	.23-.43	.24-.50	.17-.43	.28-.54	.13-.55
High Inattention										
π	.11**	.04**	.01**	.04**	.10**	.06*	.14	.13*	.08**	.18*
SE	.05	.02	.01	.02	.04	.01	.01	.03	.03	.05
99% CI	-.02-.24	-.01-.09	-.02-.04	-.01-.09	.00-.20	.03-.09	.11-.17	.05-.21	.00-.16	.05-.31

Note: π refers to the probability of being a member of a given latent class. Results for 2 year olds should be interpreted with caution.
SE = standard error. CI = confidence interval.
*Coefficient of variation between 16.6% and 33.3%; **Coefficient of variation greater than 33.3%

4.3.3 Conclusion

Under the unrestricted three-class model, most 2-11-year-old children were estimated to belong to either the low or medium latent class for both hyperactivity-impulsivity and inattention. Latent class probability estimates for the high hyperactivity-impulsivity class ranged from 5-17% for girls and from 9-23% for boys. Latent class probability estimates for the high inattention class ranged from 1-18% for girls and from 1-14% for boys.

4.4 Posterior Conditional Probability Estimates

Based on the parameter estimates under the unrestricted three-class model, it is possible to assign each child to a specific latent class (i.e., low, medium, high). Assignment is made based on the child's posterior conditional probability of belonging to the low, medium, and high latent class given her or his response pattern. A child is assigned to the latent class that maximizes the probability of observing her or his response pattern. Table 16 indicates the latent class membership for hyperactivity-impulsivity for the 27 response patterns. The actual posterior conditional probability estimates are in Appendix 1. We see that all children who have a response pattern 111 (i.e., mother responded *never or not true* to all three behaviour items) were assigned to the low hyperactivity-impulsivity latent class. In contrast, all children with a response pattern 333 (i.e., mother responded *often or very true* to all three behaviour items) were assigned to the high hyperactivity-impulsivity latent class. Table 17 indicates the latent class membership for inattention for the 27 response patterns. The actual posterior conditional probability estimates are in Appendix 2. Again, all children with a response pattern 111 were assigned to the low inattention latent class, while children with a response pattern 333 were assigned to the high inattention latent class. There were a number of inattention response patterns with zero observed frequencies. Interestingly, no child had a response pattern 133 where mothers responded *never or not true* to the item "Can't concentrate, can't pay attention for too long" and *often or very true* to the items "Stares into space" and "Is inattentive."

Table 16
Latent Class Membership Under the Unrestricted Three-Class Model of Hyperactivity-Impulsivity

	2 years		3 years		4 years		5 years		6 years		7 years		8 years		9 years		10 years		11 years	
Response pattern	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
111	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
112	L	L	M	L	L	L	L	M	L	L	L	L	M	L	L	L	M	M	L	M
113	H	H			L		L				L		H	L	L	H		L	L	
121	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
122	L	M	M	L	L	M	L	M	M	M	L	L	M	L	M	M	M	M	M	M
123		M	L	L	L	H	L		M		L		H	L	L	H	M		H	
131	L	L	L	L	L	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L
132	L	M	M	L	L	M	L	M	M	M	L	L	M	H	M	H	M	M	M	L
133	H	H	H		H	H	H			M	H		H			H			H	H
211	L	L	L	L	L	M	L	L	L	L	L	L	L	L	L	L	M	L	M	M
212	L	M	M	M	M	M	M	M	M	M	L	M	M	L	M	M	M	M	M	M
213	H	M	H	H	H	H	H	H	H	H	L		H	L	L	H	H	H	H	H
221	M	M	L	L	L	M	L	L	M	M	L	L	M	M	M	L	M	M	M	M
222	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
223	H	M	M	H	H	H	H	H	H	M	L	H	H	L	L		H	H	H	H
231	M	M	L	L	M	M	L	L	M	M	L	L	M	M	M	L	M	M	M	L
232	M	M	M	M	M	M	M	M	M	M	M	H	M	M	M	H	H	H	M	H
233	H	M	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
311	H	M	M	L	L	L	L	H	L	H	L	L	M	L	L	L	L	L	H	L
312	H	M	M	M	M	H	M	M	H	M	M	H	M	L	M	H	H	H	H	H
313	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
321	M	M	M	L	M	M	M	H	M	M	L	H	M	L	M	L	M	L	H	M
322	M	M	M	M	M	H	M	H	H	M	M	H	M	M	M	H	H	H	H	H
323	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
331	H	M	H	H	M	H	H	H	H	H	H	H	M	H	H	H	H	H	H	H
332	H	M	M	M	M	H	H	H	H	M	H	H	M	H	H	H	H	H	H	H
333	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

Note: The first number of the response pattern refers to the observed rating for the first behaviour item *Can't sit still, is restless, or hyperactive*.
The second number of the response pattern refers to the observed rating for the second behaviour item *Has difficulty awaiting turn in games or groups*. The third number of the response pattern refers to the observed rating for the third behaviour item *Cannot settle to anything for more than a few moments*.

L = low hyperactivity-impulsivity latent class; M = medium hyperactivity-impulsivity latent class; H = high hyperactivity-impulsivity latent class; The gender of the child is shown in the row (M = male, F = female); Empty cells refer to cells with an observed frequency of zero, for which the latent class to which these children should be assigned is undetermined.

Table 17
Latent Class Membership Under the Unrestricted Three-Class Model of Inattention

	2 years		3 years		4 years		5 years		6 years		7 years		8 years		9 years		10 years		11 years	
Response pattern	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
111	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
112	M	H	L	L	M	M	M	M	L	L	L	M	M	L	L	M	L	L	M	L
113	H	H	L	M	M	M	M	L	L	H	H	L			L	H		M	L	L
121	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
122	H	H	M	M	M	M	M	M	L	L	M	M	M	M	M	M	M	M	M	M
123	H					M	M	L		H	H		H	H		H	M			H
131	M	M	L	L	L	L		H	L	L	L	L	L	L			L	L	L	L
132	H	M	L		M	M	M	M	L		L	M	M	L	M	H	M	M		H
133																				
211	M	M	L	M	M	L	L	L	M	M	L	L	L	L	L	L	L	L	M	M
212	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
213	H	H	M	M	M	M	M	M	H	M	H	M	H	H	H	H	M	M	H	
221	M	M	L	M	M	L	L	L	M	M	M	M	M	M	L	L	M	M	M	M
222	M	H	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
223	H	H	M	M	M	M	H		H	H	H	M	H	H	H	H	M	M	H	H
231	M	M	L	M		L	H	H	H	M	L	L	M	H	H			M	H	M
232	M	M	M	H	M	M	H	M	H	M	M	M	H	M	M	H	M	M	H	
233				H	H		H		H		H		H	H	H	H	H	H	H	H
311	M	L	L	L	M	L	M	L	L	L	L	L	L	M	H	L	L	L	L	L
312	H	H	M	H	M	M	M	M	H	M	M	H	H	M	M	H	H	H	H	H
313	H	H	H	H	H	M	H	M	H	H	H	H	H	H	H	H	H	H	H	H
321		L	L	L	M		M	H	H		M		L	M	H	L	H	L	H	L
322	H	H	M	H	M	M	M	M	H	H	M	H	H	M	H	H	H	H	H	H
323	H	H		H	H	H	H	M	H	H	H	H	H	H	H	H	H	H	H	H
331	M	M	L	H				H	H		H		H	H			H		H	
332	H		H	H	H	H	H		H	M	H	H	H	H	H	H	H	H	H	H
333	H	H	H		H	H	H		H	H	H	H	H	H	H	H	H	H	H	H

Note: The first number of the response pattern refers to the observed rating for the first behaviour item *Can't concentrate, can't pay attention for too long*.
The second number of the response pattern refers to the observed rating for the second behaviour item *Stares into space.* The third number of the response pattern refers to the observed rating for the third behaviour item *Is inattentive*.

L = low inattention latent class; M = medium inattention latent class; H = high inattention latent class; The gender of the child is shown in the row (M = male, F = female); Empty cells refer to cells with an observed frequency of zero, for which the latent class to which these children should be assigned is undetermined.

5. Discussion

The principal aim of this study was to use data from the first NLSCY collection cycle to estimate the prevalence of hyperactivity-impulsivity and inattention in 2-11-year-old girls and boys. Based on mothers' responses to three hyperactivity-impulsivity items, we found that between 5% and 17% of 2-11-year-old girls and between 9% and 23% of 2-11-year-old boys *often* manifested hyperactive-impulsive behaviours. The majority of children, however, either did not manifest hyperactive-impulsive behaviours or did so only on an occasional basis. We found a similar pattern of results for inattention. Specifically, between 1% and 18% of 2-11-year-old girls and between 1% and 14% of 2-11-year-old boys *often* manifested inattentive behaviours. However, the majority of children either did not manifest inattentive behaviours or did so only occasionally.

Findings from past community studies on ADHD subtypes (Gomez et al., 1999; Nolan et al., 2001; Pineda et al., 1999; Wolraich et al., 1996) generally have reported lower prevalence estimates of hyperactivity-impulsivity and inattention than those found in the present study. The differences most likely reflect methodological variations including the instruments used for data collection, the reliance on different informants, and the classification method used to establish prevalence estimates. It should also be noted that these past community studies attempted to approximate DSM diagnoses for the ADHD subtypes of hyperactivity-impulsivity and inattention. In contrast, we were interested in identifying a combination of items that could best capture hyperactivity-impulsivity and inattention behaviours.

A related aim of the present study was to illustrate the value of a latent class approach to the identification of childhood behaviour problems. While taking into account the lack of perfect symptom sensitivity and specificity, latent class analysis made it possible to identify an appropriate number of groups of children that could best account for mothers' behaviour reports. These mutually exclusive and exhaustive groups of children differed in their probability of manifesting hyperactive-impulsive and inattentive behaviours. As such, it may be important to view hyperactive-impulsive and inattentive behaviours along a continuum of increasing frequency rather than as behaviours that are either present or absent in a child. Our study also demonstrated the ability of latent class analysis to estimate latent class probabilities (which translate into prevalence estimates) and conditional behaviour rating probabilities (which provide information about the presence and absence of behaviours in children who do and do not belong to a specific latent class). Finally, we demonstrated how latent class analysis can be used to assign children to a specific latent class based on their mothers' pattern of responding to the behaviour items.

The results of our study have several important public policy implications. Scahill and Schwab-Stone (2000) noted that "because it could have a fundamental influence on the allocation of resources for prevention and treatment, the prevalence of a disease in the population has important implications for health policy" (p. 542). We provided estimates of the prevalence of hyperactivity-impulsivity and inattention separately for 2-11-year-old girls and boys from the Canadian population. These prevalence estimates may help guide decisions about the needs of children with behaviour problems with regard to treatment

interventions and to efforts aimed at preventing the worsening of behaviour problems over time. Additionally, we provided a means of identifying children with problematic hyperactive-impulsive and inattentive behaviours. Given the limited public resources that currently exist for mental health services, our findings may help public policy makers to best channel resources toward children who are most in need. In other words, the better we can identify children with behaviour problems, the better we can deliver intervention programs to treat these problems as early and as effectively as possible.

Our study had a number of important limitations. First, we were unable to use all of the hyperactive-impulsive and inattentive behaviour items from the NLSCY interviews. Including all the behaviour items would have resulted in a number of empty or near-empty observed frequency cells and would have posed difficulties for our interpretation of results. It is also for this reason that we did not examine hyperactive-impulsive and inattentive behaviour items together. Second, a number of our prevalence estimates had levels of error that ranged from marginal to unacceptable. As such, these estimates should be interpreted with caution. Third, we relied exclusively on mother reports to estimate the prevalence of hyperactivity-impulsivity and inattention. It will be important to validate our findings using data from other informants. Fortunately, the NLSCY includes teacher reports of school-age children's behaviours as well as self-reports from older children. Fourth, our study was cross-sectional in nature. However, data from subsequent NLSCY cycles will permit us to obtain longitudinal estimates of the prevalence of hyperactivity-impulsivity and inattention. In addition, longitudinal data will make it possible to track intra-individual change in these behaviour problems over time. Fifth, our study did not address the issue of comorbidity, despite the literature showing that hyperactivity-impulsivity and inattention frequently co-occur with other disorders, particularly those of a disruptive nature.

Appendix 1

Table A.1
Posterior Conditional Probability Estimates for Hyperactivity-Impulsivity Under the Unrestricted Three-Class Model

	2 years						3 years					
	Male			Female			Male			Female		
Response pattern	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
111	0.9905	0.0044	0.0052	0.9558	0.0430	0.0011	0.9740	0.0256	0.0004	0.9967	0.0033	0.0000
112	0.9304	0.0231	0.0465	0.5646	0.4196	0.0158	0.0000	0.9949	0.0051	0.9355	0.0645	0.0000
113	0.3210	0.0000	0.6790	0.0000	0.1280	0.8720						
121	0.9800	0.0150	0.0050	0.8746	0.1251	0.0003	0.9328	0.0668	0.0005	0.9918	0.0082	0.0000
122	0.8811	0.0760	0.0429	0.2967	0.7005	0.0028	0.0000	0.9978	0.0022	0.8508	0.1492	0.0000
123				0.0000	0.5836	0.4164	0.6661	0.1952	0.1386	1.0000	0.0000	0.0000
131	0.8303	0.0399	0.1298	0.7920	0.1959	0.0121	0.9159	0.0786	0.0055	0.9682	0.0318	0.0000
132	0.3604	0.0976	0.5420	0.1837	0.7505	0.0657	0.0000	0.9779	0.0221	0.5906	0.4094	0.0000
133	0.0155	0.0000	0.9845	0.0000	0.0596	0.9404	0.2587	0.0909	0.6503			
211	0.6261	0.3380	0.0360	0.7601	0.2397	0.0003	0.8127	0.1847	0.0026	0.9015	0.0884	0.0101
212	0.2175	0.6623	0.1202	0.1609	0.8376	0.0015	0.0000	0.9955	0.0045	0.3215	0.6651	0.0134
213	0.0411	0.0000	0.9589	0.0000	0.7584	0.2416	0.3054	0.2843	0.4102	0.1761	0.0000	0.8239
221	0.3411	0.6398	0.0191	0.4996	0.5004	0.0001	0.6166	0.3810	0.0024	0.7911	0.1973	0.0116
222	0.0825	0.8731	0.0444	0.0570	0.9428	0.0002	0.0000	0.9980	0.0020	0.1583	0.8331	0.0086
223	0.0421	0.0000	0.9579	0.0000	0.9677	0.0323	0.1948	0.4929	0.3124	0.1404	0.0000	0.8596
231	0.1161	0.6834	0.2005	0.3652	0.6330	0.0018	0.5595	0.4146	0.0259	0.4198	0.4139	0.1663
232	0.0197	0.6534	0.3269	0.0336	0.9624	0.0039	0.0000	0.9802	0.0198	0.0430	0.8939	0.0631
233	0.0014	0.0000	0.9986	0.0000	0.5752	0.4248	0.0427	0.1297	0.8276	0.0060	0.0000	0.9940
311	0.0000	0.4021	0.5979	0.0000	0.9152	0.0848	0.4210	0.4438	0.1352	0.8058	0.1388	0.0554
312	0.0000	0.2828	0.7172	0.0000	0.8836	0.1164	0.0000	0.9104	0.0896	0.2045	0.7434	0.0521
313	0.0000	0.0000	1.0000	0.0000	0.0404	0.9596	0.0072	0.0309	0.9619	0.0337	0.0000	0.9663
321	0.0000	0.7059	0.2941	0.0000	0.9904	0.0096	0.2353	0.6744	0.0903	0.6543	0.2868	0.0588
322	0.0000	0.5846	0.4154	0.0000	0.9864	0.0136	0.0000	0.9586	0.0414	0.0945	0.8740	0.0315
323	0.0000	0.0000	1.0000	0.0000	0.2866	0.7134	0.0058	0.0678	0.9265	0.0259	0.0000	0.9741
331	0.0000	0.1960	0.8040	0.0000	0.8233	0.1767	0.1103	0.3790	0.5107	0.1936	0.3356	0.4708
332	0.0000	0.1251	0.8749	0.0000	0.7660	0.2340	0.0000	0.6967	0.3033	0.0215	0.7850	0.1936
333	0.0000	0.0000	1.0000	0.0000	0.0178	0.9822	0.0005	0.0072	0.9923	0.0010	0.0000	0.9990

Table A.1 (Cont'd)
Posterior Conditional Probability Estimates for Hyperactivity-Impulsivity Under the Unrestricted Three-Class Model

	4 years						5 years					
	Male			Female			Male			Female		
Response pattern	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
111	0.9979	0.0021	0.0000	0.9202	0.0796	0.0001	0.9970	0.0022	0.0009	0.9923	0.0077	0.0000
112	0.9677	0.0296	0.0027	0.7301	0.2674	0.0025	0.9287	0.0601	0.0112	0.4709	0.5291	0.0000
113	0.8937	0.0000	0.1063				0.7513	0.0000	0.2487			
121	0.9887	0.0113	0.0000	0.6775	0.3219	0.0005	0.9855	0.0129	0.0016	0.9698	0.0302	0.0000
122	0.8520	0.1384	0.0096	0.3298	0.6634	0.0068	0.7085	0.2762	0.0153	0.1813	0.8187	0.0000
123	0.6756	0.0000	0.3244	0.0000	0.0000	1.0000	0.6270	0.0000	0.3730			
131	0.9609	0.0391	0.0000	0.2001	0.7960	0.0039	0.9714	0.0088	0.0198	0.9668	0.0332	0.0000
132	0.6001	0.3462	0.0537	0.0545	0.9180	0.0275	0.6466	0.1740	0.1794	0.1670	0.8330	0.0000
133	0.2082	0.0000	0.7918	0.0000	0.0000	1.0000	0.1159	0.0000	0.8841			
211	0.9112	0.0888	0.0000	0.4263	0.5680	0.0057	0.9052	0.0765	0.0184	0.9235	0.0693	0.0072
212	0.4081	0.5641	0.0278	0.1432	0.8074	0.0494	0.2635	0.6638	0.0727	0.0824	0.8969	0.0207
213	0.2569	0.0000	0.7431	0.0000	0.0000	1.0000	0.1165	0.0000	0.8835	0.0000	0.0000	1.0000
221	0.6589	0.3411	0.0000	0.1191	0.8713	0.0096	0.6471	0.3293	0.0236	0.7413	0.2234	0.0354
222	0.1160	0.8521	0.0319	0.0294	0.9094	0.0613	0.0600	0.9103	0.0297	0.0216	0.9453	0.0331
223	0.0789	0.0000	0.9211	0.0000	0.0000	1.0000	0.0684	0.0000	0.9316	0.0000	0.0000	1.0000
231	0.3523	0.6477	0.0000	0.0156	0.9536	0.0309	0.5497	0.1931	0.2571	0.6449	0.2147	0.1403
232	0.0342	0.8914	0.0744	0.0032	0.8321	0.1647	0.0561	0.5875	0.3564	0.0178	0.8581	0.1241
233	0.0107	0.0000	0.9893	0.0000	0.0000	1.0000	0.0057	0.0000	0.9943	0.0000	0.0000	1.0000
311	0.7899	0.2101	0.0000	0.7122	0.1685	0.1193	0.5748	0.1480	0.2772	0.0000	0.2349	0.7651
312	0.1747	0.6592	0.1661	0.1578	0.1580	0.6843	0.0657	0.5040	0.4303	0.0000	0.5812	0.4188
313	0.0242	0.0000	0.9758	0.0000	0.0000	1.0000	0.0055	0.0000	0.9945	0.0000	0.0000	1.0000
321	0.4143	0.5857	0.0000	0.3019	0.3922	0.3059	0.2926	0.4538	0.2535	0.0000	0.1679	0.8321
322	0.0402	0.8056	0.1542	0.0306	0.1680	0.8015	0.0169	0.7836	0.1995	0.0000	0.4770	0.5230
323	0.0061	0.0000	0.9939	0.0000	0.0000	1.0000	0.0031	0.0000	0.9969	0.0000	0.0000	1.0000
331	0.1661	0.8339	0.0000	0.0272	0.2956	0.6772	0.0759	0.0812	0.8429	0.0000	0.0466	0.9534
332	0.0097	0.6940	0.2963	0.0014	0.0665	0.9320	0.0054	0.1735	0.8210	0.0000	0.1810	0.8190
333	0.0008	0.0000	0.9992	0.0000	0.0000	1.0000	0.0002	0.0000	0.9998	0.0000	0.0000	1.0000

Table A.1 (Cont'd)
Posterior Conditional Probability Estimates for Hyperactivity-Impulsivity Under the Unrestricted Three-Class Model

	6 years						7 years					
	Male			Female			Male			Female		
Response pattern	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
111	0.9579	0.0421	0.0000	0.9594	0.0406	0.0000	0.9995	0.0003	0.0002	0.9963	0.0037	0.0000
112	0.6364	0.3636	0.0000	0.5919	0.4081	0.0000	0.9896	0.0075	0.0029	0.8873	0.1127	0.0000
113							0.9722	0.0000	0.0278			
121	0.7842	0.2158	0.0000	0.7475	0.2525	0.0000	0.9944	0.0045	0.0011	0.9720	0.0280	0.0000
122	0.2185	0.7815	0.0000	0.1538	0.8462	0.0000	0.8930	0.0895	0.0175	0.5031	0.4969	0.0000
123	0.0000	1.0000	0.0000				0.8376	0.0000	0.1624			
131	0.7955	0.2045	0.0000	0.6613	0.3387	0.0000	0.9666	0.0051	0.0282	0.9893	0.0107	0.0000
132	0.2303	0.7697	0.0000	0.1070	0.8930	0.0000	0.6139	0.0717	0.3144	0.7294	0.2706	0.0000
133				0.0000	1.0000	0.0000	0.1652	0.0000	0.8348			
211	0.5479	0.4437	0.0084	0.8288	0.1491	0.0221	0.9769	0.0227	0.0005	0.9551	0.0299	0.0150
212	0.0760	0.8001	0.1239	0.2544	0.7456	0.0000	0.6581	0.3365	0.0055	0.4557	0.4891	0.0552
213	0.0000	0.1824	0.8176	0.0000	0.1918	0.8082	0.9245	0.0000	0.0755			
221	0.1634	0.8286	0.0080	0.4061	0.5832	0.0108	0.7627	0.2348	0.0024	0.7728	0.1881	0.0391
222	0.0139	0.9140	0.0722	0.0410	0.9590	0.0000	0.1276	0.8652	0.0072	0.1027	0.8573	0.0400
223	0.0000	0.3042	0.6958	0.0000	0.6565	0.3435	0.6438	0.0000	0.3562	0.0000	0.0000	1.0000
231	0.1600	0.7578	0.0823	0.2908	0.6331	0.0761	0.6934	0.2488	0.0578	0.5962	0.0545	0.3493
232	0.0085	0.5253	0.4662	0.0274	0.9726	0.0000	0.0965	0.7624	0.1411	0.1156	0.3624	0.5220
233	0.0000	0.0374	0.9626	0.0000	0.2266	0.7734	0.0649	0.0000	0.9351	0.0000	0.0000	1.0000
311	0.7724	0.1480	0.0796	0.3366	0.1385	0.5249	0.9049	0.0680	0.0270	0.4949	0.0401	0.4650
312	0.0692	0.1725	0.7583	0.1298	0.8702	0.0000	0.3145	0.5206	0.1649	0.0907	0.2523	0.6570
313	0.0000	0.0078	0.9922	0.0000	0.0092	0.9908	0.1620	0.0000	0.8380	0.0000	0.0000	1.0000
321	0.3954	0.4745	0.1302	0.1715	0.5634	0.2651	0.4548	0.4532	0.0920	0.2149	0.1356	0.6495
322	0.0194	0.3024	0.6782	0.0183	0.9817	0.0000	0.0377	0.8283	0.1340	0.0218	0.4710	0.5072
323	0.0000	0.0152	0.9848	0.0000	0.0697	0.9303	0.0278	0.0000	0.9722	0.0000	0.0000	1.0000
331	0.1793	0.2010	0.6197	0.0470	0.2342	0.7188	0.1345	0.1562	0.7093	0.0276	0.0065	0.9659
332	0.0026	0.0381	0.9593	0.0122	0.9878	0.0000	0.0084	0.2148	0.7768	0.0036	0.0291	0.9673
333	0.0000	0.0014	0.9986	0.0000	0.0114	0.9886	0.0011	0.0000	0.9989	0.0000	0.0000	1.0000

Table A.1 (Cont'd)
Posterior Conditional Probability Estimates for Hyperactivity-Impulsivity Under the Unrestricted Three-Class Model

	8 years						9 years					
	Male			Female			Male			Female		
Response pattern	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
111	0.9555	0.0445	0.0000	0.9991	0.0000	0.0009	0.9902	0.0098	0.0000	0.9856	0.0135	0.0009
112	0.1218	0.8646	0.0137	0.9825	0.0000	0.0175	0.8121	0.1879	0.0000	0.6861	0.2839	0.0300
113	0.0000	0.0723	0.9277	0.9283	0.0000	0.0717	1.0000	0.0000	0.0000	0.0785	0.0000	0.9215
121	0.8222	0.1778	0.0000	0.9955	0.0000	0.0045	0.9528	0.0472	0.0000	0.9130	0.0816	0.0053
122	0.0292	0.9636	0.0072	0.9155	0.0000	0.0845	0.4629	0.5371	0.0000	0.2506	0.6766	0.0728
123	0.0000	0.1415	0.8585	0.7142	0.0000	0.2858	1.0000	0.0000	0.0000	0.0127	0.0000	0.9873
131	0.6737	0.3263	0.0000	0.9505	0.0000	0.0495	0.9565	0.0435	0.0000	0.9055	0.0058	0.0887
132	0.0128	0.9426	0.0446	0.4829	0.0000	0.5171	0.4842	0.5158	0.0000	0.1649	0.0321	0.8030
133	0.0000	0.0253	0.9747							0.0008	0.0000	0.9992
211	0.8062	0.1938	0.0000	0.9398	0.0589	0.0013	0.7792	0.2186	0.0022	0.8807	0.1151	0.0042
212	0.0265	0.9695	0.0040	0.6349	0.3467	0.0184	0.1306	0.8590	0.0104	0.1929	0.7612	0.0459
213	0.0000	0.2286	0.7714	0.8884	0.0000	0.1116	0.8686	0.0000	0.1314	0.0154	0.0000	0.9846
221	0.4725	0.5275	0.0000	0.4291	0.5678	0.0031	0.4125	0.5805	0.0070	0.5307	0.4524	0.0169
222	0.0058	0.9922	0.0020	0.0789	0.9093	0.0118	0.0290	0.9573	0.0137	0.0353	0.9089	0.0558
223	0.0000	0.3851	0.6149	0.6056	0.0000	0.3944	0.5268	0.0000	0.4732			
231	0.2857	0.7143	0.0000	0.4215	0.5428	0.0357	0.3923	0.5067	0.1010	0.6271	0.0386	0.3343
232	0.0026	0.9851	0.0123	0.0716	0.8035	0.1248	0.0260	0.7874	0.1866	0.0341	0.0632	0.9027
233	0.0000	0.0899	0.9101	0.1169	0.0000	0.8831	0.0682	0.0000	0.9318	0.0001	0.0000	0.9999
311	0.4807	0.5193	0.0000	0.9302	0.0286	0.0412	0.5271	0.4118	0.0610	0.8590	0.0860	0.0551
312	0.0056	0.9236	0.0708	0.4590	0.1228	0.4181	0.0444	0.8124	0.1432	0.1387	0.4192	0.4421
313	0.0000	0.0158	0.9842	0.2020	0.0000	0.7980	0.1399	0.0000	0.8601	0.0012	0.0000	0.9988
321	0.1662	0.8338	0.0000	0.5325	0.3453	0.1222	0.1784	0.6990	0.1226	0.4810	0.3141	0.2050
322	0.0013	0.9638	0.0349	0.0879	0.4968	0.4152	0.0089	0.8199	0.1712	0.0239	0.4705	0.5056
323	0.0000	0.0329	0.9671	0.0466	0.0000	0.9534	0.0267	0.0000	0.9733	0.0002	0.0000	0.9998
331	0.0817	0.9183	0.0000	0.2329	0.1470	0.6201	0.0664	0.2389	0.6947	0.1221	0.0058	0.8721
332	0.0005	0.8128	0.1867	0.0163	0.0897	0.8940	0.0027	0.2237	0.7737	0.0028	0.0040	0.9932
333	0.0000	0.0053	0.9947	0.0042	0.0000	0.9958	0.0018	0.0000	0.9982	0.0000	0.0000	1.0000

Table A.1 (Cont'd)
Posterior Conditional Probability Estimates for Hyperactivity-Impulsivity Under the Unrestricted Three-Class Model

	10 years						11 years					
	Male			Female			Male			Female		
Response pattern	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
111	0.8890	0.1110	0.0000	0.8899	0.1101	0.0000	0.9536	0.0431	0.0033	0.9379	0.0620	0.0001
112	0.0000	1.0000	0.0000	0.1725	0.8275	0.0000	0.5602	0.3633	0.0766	0.3068	0.6845	0.0087
113				1.0000	0.0000	0.0000	0.7760	0.0000	0.2240			
121	0.6800	0.3200	0.0000	0.6645	0.3355	0.0000	0.8435	0.1365	0.0199	0.7480	0.2512	0.0008
122	0.0000	1.0000	0.0000	0.0486	0.9514	0.0000	0.2348	0.5450	0.2202	0.0793	0.8989	0.0219
123	0.0000	1.0000	0.0000				0.3356	0.0000	0.6644			
131	0.6848	0.3152	0.0000	0.7818	0.2182	0.0000	0.8002	0.1563	0.0435	0.9971	0.0000	0.0029
132	0.0000	1.0000	0.0000	0.0846	0.9154	0.0000	0.1679	0.4702	0.3618	0.5705	0.0000	0.4295
133							0.1802	0.0000	0.8198	0.0000	0.0000	1.0000
211	0.4308	0.5653	0.0039	0.5124	0.4834	0.0042	0.3532	0.6047	0.0421	0.4385	0.5525	0.0090
212	0.0000	0.8935	0.1065	0.0233	0.8537	0.1229	0.0330	0.8107	0.1563	0.0205	0.8702	0.1094
213	0.0000	0.1849	0.8151	0.1050	0.0000	0.8950	0.0910	0.0000	0.9090	0.0000	0.0000	1.0000
221	0.1674	0.8275	0.0052	0.2036	0.7840	0.0124	0.1259	0.7712	0.1030	0.1315	0.8421	0.0264
222	0.0000	0.9031	0.0969	0.0053	0.7879	0.2069	0.0082	0.7242	0.2675	0.0037	0.8031	0.1932
223	0.0000	0.2014	0.7986	0.0155	0.0000	0.9845	0.0144	0.0000	0.9856	0.0000	0.0000	1.0000
231	0.1632	0.7895	0.0473	0.2833	0.6031	0.1136	0.0973	0.7196	0.1830	0.6463	0.0000	0.3537
232	0.0000	0.4927	0.5073	0.0029	0.2420	0.7551	0.0055	0.5837	0.4107	0.0070	0.0000	0.9930
233	0.0000	0.0256	0.9744	0.0024	0.0000	0.9976	0.0063	0.0000	0.9937	0.0000	0.0000	1.0000
311	0.5568	0.3388	0.1044	0.8835	0.0877	0.0288	0.0000	0.0000	1.0000	0.6753	0.2553	0.0694
312	0.0000	0.1588	0.8412	0.0388	0.1492	0.8120	0.0000	0.0000	1.0000	0.0247	0.3156	0.6596
313	0.0000	0.0051	0.9949	0.0287	0.0000	0.9713	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000
321	0.2546	0.5837	0.1617	0.6070	0.2458	0.1472	0.0000	0.0000	1.0000	0.2551	0.4900	0.2550
322	0.0000	0.1735	0.8265	0.0058	0.0910	0.9032	0.0000	0.0000	1.0000	0.0031	0.1994	0.7975
323	0.0000	0.0056	0.9944	0.0040	0.0000	0.9960	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000
331	0.1086	0.2436	0.6478	0.3550	0.0795	0.5656	0.0000	0.0000	1.0000	0.2681	0.0000	0.7319
332	0.0000	0.0214	0.9786	0.0010	0.0084	0.9906	0.0000	0.0000	1.0000	0.0014	0.0000	0.9986
333	0.0000	0.0006	0.9994	0.0006	0.0000	0.9994	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000

Appendix 2

Table A.2
Posterior Conditional Probability Estimates for Inattention Under the Unrestricted Three-Class Model

	2 years						3 years					
	Male			Female			Male			Female		
Response pattern	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
111	0.9101	0.0899	0.0000	0.8665	0.1335	0.0000	0.9948	0.0052	0.0000	0.9726	0.0274	0.0000
112	0.0000	0.5746	0.4254	0.1480	0.4063	0.4457	0.7100	0.2900	0.0000	0.7053	0.2947	0.0000
113	0.0000	0.0000	1.0000	0.2941	0.0000	0.7059	0.9102	0.0898	0.0000	0.0000	1.0000	0.0000
121	0.8108	0.1892	0.0000	0.8372	0.1628	0.0000	0.9767	0.0233	0.0000	0.9327	0.0673	0.0000
122	0.0000	0.2728	0.7272	0.0380	0.1319	0.8301	0.3476	0.6524	0.0000	0.4836	0.5164	0.0000
123	0.0000	0.0000	1.0000									
131	0.3602	0.6398	0.0000	0.0000	1.0000	0.0000	0.9885	0.0115	0.0000	0.9166	0.0834	0.0000
132	0.0000	0.4008	0.5992	0.0000	0.7287	0.2713	0.5224	0.4776	0.0000			
133												
211	0.2532	0.7468	0.0000	0.0000	1.0000	0.0000	0.9278	0.0722	0.0000	0.4952	0.5033	0.0015
212	0.0000	0.9703	0.0297	0.0000	0.6861	0.3139	0.1403	0.8597	0.0000	0.0613	0.9230	0.0157
213	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.4031	0.5969	0.0000	0.0000	0.9281	0.0719
221	0.1256	0.8744	0.0000	0.0000	1.0000	0.0000	0.7365	0.2635	0.0000	0.2770	0.7194	0.0036
222	0.0000	0.9006	0.0994	0.0000	0.2758	0.7242	0.0343	0.9657	0.0000	0.0247	0.9481	0.0273
223	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.1281	0.8719	0.0000	0.0000	0.8841	0.1159
231	0.0185	0.9815	0.0000	0.0000	1.0000	0.0000	0.8516	0.1484	0.0000	0.1944	0.6371	0.1686
232	0.0000	0.9417	0.0583	0.0000	0.8656	0.1344	0.0680	0.9320	0.0000	0.0081	0.3954	0.5965
233										0.0000	0.1270	0.8730
311	0.3871	0.6129	0.0000	0.8996	0.1004	0.0000	0.9361	0.0639	0.0000	0.8326	0.0000	0.1674
312	0.0000	0.4571	0.5429	0.0137	0.0273	0.9590	0.0878	0.4714	0.4408	0.0556	0.0000	0.9444
313	0.0000	0.0000	1.0000	0.0176	0.0000	0.9824	0.0243	0.0316	0.9440	0.0000	0.0000	1.0000
321				0.8765	0.1235	0.0000	0.7612	0.2388	0.0000	0.5350	0.0000	0.4650
322	0.0000	0.1895	0.8105	0.0020	0.0049	0.9931	0.0389	0.9611	0.0000	0.0134	0.0000	0.9866
323	0.0000	0.0000	1.0000	0.0025	0.0000	0.9975				0.0000	0.0000	1.0000
331	0.0340	0.9660	0.0000	0.0000	1.0000	0.0000	0.8674	0.1326	0.0000	0.0171	0.0000	0.9829
332	0.0000	0.2942	0.7058				0.0108	0.1305	0.8587	0.0002	0.0000	0.9998
333	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0016	0.0047	0.9936			

Table A.2 (Cont'd)
Posterior Conditional Probability Estimates for Inattention Under the Unrestricted Three-Class Model

	4 years						5 years					
	Male			Female			Male			Female		
Response pattern	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
111	0.9071	0.0929	0.0000	1.0000	0.0000	0.0000	0.9663	0.0337	0.0000	1.0000	0.0000	0.0000
112	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000
113	0.3469	0.6531	0.0000	0.4450	0.5533	0.0017	0.3297	0.6703	0.0000	0.7633	0.2367	0.0000
121	0.7606	0.2394	0.0000	1.0000	0.0000	0.0000	0.9299	0.0701	0.0000	0.9401	0.0000	0.0599
122	0.0000	1.0000	0.0000	0.0000	0.9978	0.0022	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000
123				0.1753	0.5644	0.2603	0.1855	0.8145	0.0000	0.5179	0.4821	0.0000
131	0.5504	0.4496	0.0000	1.0000	0.0000	0.0000				0.0000	0.0000	1.0000
132	0.0000	1.0000	0.0000	0.0000	0.9357	0.0643	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000
133												
211	0.4703	0.5297	0.0000	1.0000	0.0000	0.0000	0.7776	0.2148	0.0076	1.0000	0.0000	0.0000
212	0.0000	0.9998	0.0002	0.0000	1.0000	0.0000	0.0000	0.9861	0.0139	0.0000	1.0000	0.0000
213	0.0432	0.8945	0.0623	0.0819	0.9181	0.0000	0.0406	0.6536	0.3057	0.2146	0.7854	0.0000
221	0.2241	0.7759	0.0000	1.0000	0.0000	0.0000	0.6078	0.3627	0.0295	0.6745	0.0000	0.3255
222	0.0000	0.9997	0.0003	0.0000	1.0000	0.0000	0.0000	0.9688	0.0312	0.0000	1.0000	0.0000
223	0.0137	0.8739	0.1123	0.0333	0.9667	0.0000	0.0137	0.4761	0.5102			
231				1.0000	0.0000	0.0000	0.0000	0.1574	0.8426	0.0000	0.0000	1.0000
232	0.0000	0.9757	0.0243	0.0000	1.0000	0.0000	0.0000	0.3209	0.6791	0.0000	1.0000	0.0000
233	0.0005	0.0909	0.9086				0.0000	0.0140	0.9860			
311	0.0000	1.0000	0.0000	1.0000	0.0000	0.0000	0.2683	0.5436	0.1881	1.0000	0.0000	0.0000
312	0.0000	0.9765	0.0235	0.0000	0.9955	0.0045	0.0000	0.8796	0.1204	0.0000	1.0000	0.0000
313	0.0000	0.0937	0.9063	0.0334	0.4925	0.4741	0.0015	0.1797	0.8188	0.1210	0.8790	0.0000
321	0.0000	1.0000	0.0000				0.1131	0.4948	0.3922	0.2982	0.0000	0.7018
322	0.0000	0.9574	0.0426	0.0000	0.5970	0.4030	0.0000	0.7614	0.2386	0.0000	1.0000	0.0000
323	0.0000	0.0531	0.9469	0.0002	0.0069	0.9929	0.0003	0.0874	0.9122	0.0438	0.9562	0.0000
331										0.0000	0.0000	1.0000
332	0.0000	0.2244	0.7756	0.0000	0.0446	0.9554	0.0000	0.0463	0.9537			
333	0.0000	0.0007	0.9993	0.0000	0.0002	0.9998	0.0000	0.0015	0.9985			

Table A.2 (Cont'd)
Posterior Conditional Probability Estimates for Inattention Under the Unrestricted Three-Class Model

	6 years						7 years					
	Male			Female			Male			Female		
Response pattern	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
111	0.9967	0.0033	0.0000	1.0000	0.0000	0.0000	0.9931	0.0066	0.0003	0.9735	0.0265	0.0000
112	0.9511	0.0479	0.0010	0.9683	0.0000	0.0317	0.7839	0.2156	0.0005	0.0623	0.9203	0.0173
113	0.9934	0.0000	0.0066	0.0000	0.0000	1.0000	0.4886	0.0000	0.5114	0.8549	0.1319	0.0133
121	0.9876	0.0122	0.0001	1.0000	0.0000	0.0000	0.9422	0.0548	0.0030	0.7660	0.2340	0.0000
122	0.8375	0.1577	0.0048	0.5844	0.0000	0.4156	0.2932	0.7049	0.0019	0.0059	0.9786	0.0155
123				0.0000	0.0000	1.0000	0.0831	0.0000	0.9169			
131	0.9935	0.0000	0.0065	1.0000	0.0000	0.0000	0.9505	0.0141	0.0354	0.9627	0.0373	0.0000
132	0.7969	0.0000	0.2031				0.5917	0.3634	0.0448	0.0308	0.6478	0.3215
133												
211	0.4063	0.5866	0.0071	0.0000	1.0000	0.0000	0.8481	0.1457	0.0062	0.7444	0.2556	0.0000
212	0.0423	0.9287	0.0290	0.0000	0.9935	0.0065	0.1231	0.8750	0.0018	0.0053	0.9947	0.0000
213	0.1903	0.0000	0.8097	0.0000	0.5870	0.4130	0.0378	0.0000	0.9622	0.3391	0.6609	0.0000
221	0.1539	0.8315	0.0146	0.0000	1.0000	0.0000	0.3877	0.5823	0.0301	0.2058	0.7942	0.0000
222	0.0115	0.9458	0.0427	0.0000	0.9575	0.0425	0.0158	0.9817	0.0025	0.0005	0.9995	0.0000
223	0.0416	0.0000	0.9584	0.0000	0.1738	0.8262	0.0037	0.0000	0.9963	0.0437	0.9563	0.0000
231	0.1926	0.0000	0.8074	0.0000	1.0000	0.0000	0.4372	0.1678	0.3950	0.6714	0.3286	0.0000
232	0.0061	0.0000	0.9939	0.0000	0.9781	0.0219	0.0534	0.8482	0.0984	0.0037	0.9963	0.0000
233	0.0010	0.0000	0.9990				0.0003	0.0000	0.9997			
311	0.5049	0.1423	0.3528	0.6114	0.3886	0.0000	0.6463	0.2275	0.1262	1.0000	0.0000	0.0000
312	0.0306	0.1314	0.8379	0.1314	0.7420	0.1266	0.0627	0.9124	0.0249	0.0007	0.0000	0.9993
313	0.0059	0.0000	0.9941	0.0000	0.0519	0.9481	0.0015	0.0000	0.9985	0.0126	0.0000	0.9874
321	0.1714	0.1808	0.6478				0.1630	0.5017	0.3353			
322	0.0061	0.0973	0.8966	0.0249	0.4530	0.5221	0.0075	0.9608	0.0316	0.0001	0.0000	0.9999
323	0.0011	0.0000	0.9989	0.0000	0.0080	0.9920	0.0001	0.0000	0.9999	0.0013	0.0000	0.9987
331	0.0059	0.0000	0.9941				0.0388	0.0305	0.9307			
332	0.0002	0.0000	0.9998	0.0074	0.6272	0.3654	0.0121	0.3948	0.5930	0.0000	0.0000	1.0000
333	0.0000	0.0000	1.0000	0.0000	0.0158	0.9842	0.0000	0.0000	1.0000	0.0003	0.0000	0.9997

Table A.2 (Cont'd)
Posterior Conditional Probability Estimates for Inattention Under the Unrestricted Three-Class Model

	8 years						9 years					
	Male			Female			Male			Female		
Response pattern	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
111	0.9667	0.0333	0.0001	0.9938	0.0062	0.0000	0.9938	0.0062	0.0000	0.9583	0.0417	0.0000
112	0.3880	0.6090	0.0030	0.8639	0.1359	0.0001	0.6551	0.3449	0.0000	0.0000	0.9759	0.0241
113							1.0000	0.0000	0.0000	0.0000	0.0000	1.0000
121	0.8221	0.1777	0.0003	0.9395	0.0602	0.0003	0.9716	0.0284	0.0000	0.8932	0.1068	0.0000
122	0.0918	0.9040	0.0042	0.3830	0.6162	0.0009	0.2896	0.7104	0.0000	0.0000	0.9193	0.0807
123	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000				0.0000	0.0000	1.0000
131	0.7944	0.1937	0.0119	0.9490	0.0366	0.0144						
132	0.0703	0.7811	0.1486	0.4799	0.4647	0.0555	0.0000	1.0000	0.0000	0.0000	0.0000	1.0000
133												
211	0.5082	0.4822	0.0096	0.7745	0.2234	0.0021	0.8212	0.1230	0.0558	0.8044	0.1956	0.0000
212	0.0213	0.9218	0.0569	0.1210	0.8765	0.0025	0.0703	0.8857	0.0440	0.0000	0.8098	0.1902
213	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0956	0.0000	0.9044	0.0000	0.0000	1.0000
221	0.1415	0.8424	0.0161	0.2507	0.7396	0.0097	0.3747	0.2616	0.3637	0.5992	0.4008	0.0000
222	0.0035	0.9409	0.0556	0.0133	0.9828	0.0039	0.0146	0.8552	0.1302	0.0000	0.5452	0.4548
223	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0074	0.0000	0.9926	0.0000	0.0000	1.0000
231	0.0774	0.5201	0.4025	0.2096	0.3721	0.4184	0.0000	0.1699	0.8301			
232	0.0010	0.2944	0.7046	0.0165	0.7336	0.2500	0.0000	0.6513	0.3487	0.0000	0.0000	1.0000
233	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000
311	0.8630	0.0000	0.1370	0.0000	0.9149	0.0851	0.0000	0.1659	0.8341	1.0000	0.0000	0.0000
312	0.0428	0.0000	0.9572	0.0000	0.9726	0.0274	0.0000	0.6448	0.3552	0.0000	0.0000	1.0000
313	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000
321	0.5120	0.0000	0.4880	0.0000	0.8843	0.1157	0.0000	0.0609	0.9391	1.0000	0.0000	0.0000
322	0.0074	0.0000	0.9926	0.0000	0.9619	0.0381	0.0000	0.3720	0.6280	0.0000	0.0000	1.0000
323	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000
331	0.0224	0.0000	0.9776	0.0000	0.0818	0.9182						
332	0.0002	0.0000	0.9998	0.0000	0.2273	0.7727	0.0000	0.1442	0.8558	0.0000	0.0000	1.0000
333	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000

Table A.2 (Cont'd)
Posterior Conditional Probability Estimates for Inattention Under the Unrestricted Three-Class Model

	10 years						11 years					
	Male			Female			Male			Female		
Response pattern	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
111	0.9777	0.0223	0.0000	0.9861	0.0139	0.0000	0.9677	0.0323	0.0000	0.9806	0.0194	0.0000
112	0.6876	0.3124	0.0000	0.6417	0.3583	0.0000	0.3229	0.6771	0.0000	0.6541	0.3262	0.0197
113				0.0000	1.0000	0.0000	1.0000	0.0000	0.0000	0.8220	0.0000	0.1780
121	0.8526	0.1474	0.0000	0.9377	0.0623	0.0000	0.8695	0.1305	0.0000	0.9068	0.0932	0.0000
122	0.2250	0.7750	0.0000	0.2759	0.7241	0.0000	0.0959	0.9041	0.0000	0.2469	0.6398	0.1133
123	0.0000	1.0000	0.0000							0.2326	0.0000	0.7674
131	0.9275	0.0725	0.0000	0.9711	0.0289	0.0000	1.0000	0.0000	0.0000	0.9938	0.0062	0.0000
132	0.3913	0.6087	0.0000	0.4597	0.5403	0.0000				0.0704	0.0111	0.9185
133												
211	0.5283	0.4675	0.0042	0.5170	0.4830	0.0000	0.3119	0.5879	0.1002	0.1879	0.8121	0.0000
212	0.0531	0.9365	0.0104	0.0259	0.9563	0.0178	0.0071	0.8358	0.1572	0.0090	0.9822	0.0088
213	0.0000	0.7799	0.2201	0.0000	0.8000	0.2000	0.0031	0.0000	0.9969			
221	0.1285	0.8618	0.0097	0.1855	0.8145	0.0000	0.0711	0.6022	0.3268	0.0426	0.9574	0.0000
222	0.0073	0.9792	0.0135	0.0056	0.9663	0.0281	0.0012	0.6247	0.3741	0.0017	0.9727	0.0256
223	0.0000	0.7399	0.2601	0.0000	0.7186	0.2814	0.0002	0.0000	0.9998	0.0092	0.0000	0.9908
231				0.3372	0.6628	0.0000	0.0146	0.0000	0.9854	0.4223	0.5777	0.0000
232	0.0144	0.8678	0.1178	0.0079	0.6159	0.3762	0.0002	0.0000	0.9998			
233	0.0000	0.2240	0.7760	0.0000	0.1085	0.8915	0.0000	0.0000	1.0000	0.0003	0.0000	0.9997
311	0.4737	0.2822	0.2441	1.0000	0.0000	0.0000	0.4713	0.0591	0.4696	1.0000	0.0000	0.0000
312	0.0393	0.4660	0.4948	0.0553	0.0000	0.9447	0.0128	0.1010	0.8861	0.0995	0.0000	0.9005
313	0.0000	0.0356	0.9644	0.0000	0.0000	1.0000	0.0010	0.0000	0.9990	0.0151	0.0000	0.9849
321	0.0963	0.4350	0.4686	1.0000	0.0000	0.0000	0.0632	0.0356	0.9012	1.0000	0.0000	0.0000
322	0.0048	0.4285	0.5667	0.0079	0.0000	0.9921	0.0010	0.0345	0.9645	0.0072	0.0000	0.9928
323	0.0000	0.0288	0.9712	0.0000	0.0000	1.0000	0.0001	0.0000	0.9999	0.0010	0.0000	0.9990
331	0.0405	0.0826	0.8769				0.0047	0.0000	0.9953			
332	0.0018	0.0711	0.9271	0.0008	0.0000	0.9992	0.0001	0.0000	0.9999	0.0003	0.0000	0.9997
333	0.0000	0.0030	0.9970	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000	0.0000	0.0000	1.0000

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