This chapter is available only in PDF format (and not in HTML format) because the tables, figures and photos included in this chapter cannot be displayed satisfactorily in the HTML format. Also, the page numbers in the PDF format of this chapter do not correspond to the page numbers in the original report because of formatting changes during conversion of the original report (Word file) into PDF format.

Results

Summary Data. Means and standard deviations were computed for all 63 primary endpoints, sorted by level within each risk status category (i.e., high or low neonatal risk, high or low IQ and LD present or absent. These data are summarized by test type in Tables 8 through 12.

Table 8
Means (SDs) for Auditory Processing Endpoints

Test or Task	Risk Factor					
	Neonatal Risk		LD		IQ	
	Low Risk n=227	High Risk n=76	No LD N=244	LD n=49	>84 n=232	≤84 n=61
PPST Total						
Correct	63.9(10.3)	63.8(11.1)	55.3(13.6)	59.2(10.9)	41.7(19.0)	59.6(11.1)
Correct+Reversed	56.0(15.0)	55.0(15.4)	63.5(11.2)	66.7(4.9)	53.7(17.1)	66.7(5.1)
PPST Gestures-Verbal						
Correct	2.0(4.0)	2.3(3.9)	2.6(4.8)	0.9(4.6)	2.9(6.4)	2.2(4.4)
Correct+Reversed	2.4(4.9)	2.3(5.2)	2.1(4.0)	1.4(2.8)	4.1(5.5)	1.5(3.2)
Auditory CPT Errors						
Attention	7.7(8.9)	8.1(9.5)	8.0(9.2)	5.3(5.3)	10.9(11.3)	6.8(8.1)
Impulsivity	6.1(10.0)	5.1(5.9)	6.0(9.8)	4.8(5.0)	8.3(10..0)	5.1(8.7)
DD-DP Passes, L+R	34.9(6.9)	34.8(5.9)	34.8(6.9)	36.0(5.4)	28.9(9.0)	36.4(4.8)

Table 9
Means (SDs) for Auditory Electrophysiology Endpoints

Test or Task	Risk Factor					
	Neonatal Risk		LD		IQ	
	Low Risk n=227	High Risk n=76	No LD n=244	LD n=49	>84 n=232	≤84 n=61
Signal-to-noise ratios in dB						
DP OAE @ 70dB						
1000 Hz	5.8(8.6)	5.2(9.4)	5.8(8.7)	4.9(9.1)	6.2(9.4)	5.5(8.6)
2000 Hz	9.9(8.7)	8.7(8.2)	9.6(8.7)	9.3(7.6)	9.4(8.6)	9.6(8.5)
3000 Hz	7.6(8.7)	6.8(8.2)	7.5(8.7)	7.3(8.2)	6.1(8.5)	7.8(8.6)
4000 Hz	8.210.0)	7.5(8.1)	8.0(10.0)	8.6(7.0)	6.2(10.6)	8.6(9.1)
6000 Hz	12.9(9.6)	11.7(11.0)	12.5(10.3)	13.0(8.4)	9.5(10.4)	13.4(9.7)
Click Evoked OAE						
1000 Hz	9.4(7.4)	7.3(6.9)	8.9(7.3)	8.5(7.2)	8.7(7.6)	8.9(7.2)
1500 Hz	13.8(7.6)	12.2(7.6)	13.2(7.9)	14.0(6.2)	13.0(8.1)	13.5(7.5)
2000 Hz	13.5(7.1)	12.9(7.0)	13.6(7.1)	12.3(6.6)	12.7(8.0)	13.6(6.8)
3000 Hz	12.5(7.1)	12.5(7.0)	12.6(7.1)	11.8(7.2)	11.4(7.1)	12.8(7.0)
4000 Hz	12.7(6.9)	12.6(7.5)	13.0(7.1)	11.7(6.9)	10.7(6.4)	13.3(7.1)
Spontaneous Number OAEs	0.8(1.9)	0.7(1.3)	0.8(1.9)	0.4(1.1)	0.8(1.7)	0.8(1.8)
BAER Latency Shifts @ 80dB) in msec*						
Wave I						
39-19	0.04(0.09)	0.04(0.13)	0.04(0.09)	0.04(0.11)	0.03(0.09)	0.05(0.10)
69-39	0.05(0.12)	0.07(0.10)	0.06(0.12)	0.06(0.08)	0.09(0.10)	0.05(0.12)
Wave III						
39-19	0.11(0.21)	0.11(0.11)	0.11(0.20)	0.12(0.11)	0.07(0.26)	0.12(0.16)
69-39	0.11(0.18)	0.11(0.12)	0.11(0.18)	0.12(0.11)	0.11(0.12)	0.11(0.18)
Wave V						
39-19	0.18(0.12)	0.20(0.15)	0.19(0.14)	0.19(0.10)	0.18(0.13)	0.19(0.13)
69-39	0.23(0.13)	0.20(0.14)	0.22(0.13)	0.22(0.12)	0.24(0.13)	0.21(0.13)

* Latency shifts were selected as the primary BAER endpoint. Many differences may occur when using absolute latencies (e.g., females have shorter latencies than males).

Table 10
Means (SDs) for Cognitive Evoked Potential and Visual Attention

Test or Task	Risk Factor					
	Neonatal Risk		LD		IQ	
	Low Risk n=227	High Risk n=76	No LD n=244	LD n=49	>84 n=232	≤84 n=61
Component Latency (Msec)						
Cz	458.6(70.5)	446.5(65.6	453.8(68.5)	458.0(73.5)	451.1(55.2)	455.9(72.0)
Pz	459.3(77.3)	446.6(62.0)	455.8(74.5)	452.9(69.6)	453.6(57.6)	456.2(76.9)
Amplitude (μV)						
Cz	16.4(6.9)	16.4(7.4)	16.7(7.1)	15.3(6.1)	15.9(7.8)	16.5(6.8)
Pz	19.5(8.0)	21.0(3.3)	20.1(8.6)	19.0(7.3)	17.9(10.0)	20.4(7.9)
Correct Responses						
% Rare Targets	97.6(6.6)	98.5(3.3)	97.8(6.1)	98.5(3.0)	96.8(5.7)	98.1(5.9)
# Rare Targets	48.8(3.3)	49.2(1.6)	48.9(3.1)	49.2(1.5)	48.4(2.9)	49.1(3.0)
CPT Errors						
Omission	1.4(3.8)	0.7(1.6)	1.1(3.1)	1.7(4.3)	1.6(2.8)	1.1(3.4)
Commission	5.6(11.3)	3.5(4.2)	4.9(8.3)	5.6(15.5)	6.2(10.6)	4.8(9.7)
CPT Response RT (Msec)						
Correct IDs	472.1(78.6)	468.9(78.9)	474.0(78.0)	452.4(78.2)	476.6(69.7)	469.7(80.5)
Commission	328.1(118.7)	328.2(104.0)	331.9(115.4)	298.5(108.6)	345.0(113.6)	320.6(113.8)

These data show that mean differences between risk statuses within each risk category were small and that the SDs was generally large. The largest differences occurred within the IQ risk category and mainly on auditory processing tasks (Table 8), CANTAB tasks (Table 11), monitoring and vigilance and tremor tasks (Table 12). From these results we surmised that covariates were probably blurring the group differences within each risk category, and that the behavioral tasks were probably more likely to detect difference in performance between groups than were the electrophysiological tasks.

Regression and ROC Analyses. Separate multiple regression analyses combined with ROC plots were run for each of the 63 endpoints for each risk category. As noted in the analysis plan, the regression model for each endpoint included a predetermined set of covariates along with all interactions between this set and the status variable. These included age at testing, gender, experience using a computer manipulandum, experience with video games, and hearing status. Any non-significant interactions were dropped from the final model. ROC curves were plotted for all endpoints with discriminating ability significantly better than chance, or with covariates that significantly affected diagnostic accuracy. In each analysis, the area under the ROC curve was computed for each significant curve within each endpoint.

For IQ risk, a total of 42 out of 63 endpoints yielded at least one ROC curve with a peak significantly above (or below) the chance diagonal. i.e., an arc significantly different than 0.5. The neonatal risk analysis yielded a total of 26 out of 63 endpoints with at least one significant curve and the LD risk analysis, 18 out of 63 endpoints. In each set of risk factor curves, some analyses yielded very complicated outcomes. For example, sometimes the only significant curve resulted for one gender with computer experience under the age of 10. These endpoints were excluded from the final battery. Further eliminations were made from the remaining endpoint curves that fell below an area under the curve of 0.70, i.e., 70% detection of true positives and true negatives. This was an arbitrary decision since there are no benchmarks for ideal sensitivity and specificity. We decided not to raise the cutoff point so high that the battery would be reduced

to a few endpoints that might not cover all domains of function that should be measured, but also not to set the cutoff so low that endpoints affected by too much variability would be included.

Table 11
Means (SDs) for Neuropsychological Endpoints

Test or Task	Risk Factor					
	Neonatal Risk		LD		IQ	
	Low Risk n=227	High Risk n=76	No LD N=244	LD n=49	>84 n=232	≤84 n=61
Intra- and Extra-dimensional Shift						
Trials	132.9(48.1)	133.0(55.9)	130.9(48.0)	143.9(59.9)	139.8(57.7)	131.1(47.8)
Stages	7.8(1.2)	7.8(1.4)	7.9(1.2)	7.5(1.5)	7.7(1.5)	7.9(1.2)
Errors	45.2(27.4)	44.4(32.6)	43.7(27.6)	51.5(34.2)	49.2(33.7)	43.9(27.2)
Delayed Match-to-Sample						
Long Delay	71.5(21.7)	69.9(25.0)	70.3(22.7)	75.0(22.8)	59.4(22.9)	74.4(21.4)
Medium Delay	72.0(21.0)	77.0(22.0)	73.5(21.6)	72.4(20.6)	71.3(21.4)	74.0(21.3)
Short Delay	76.4(18.8)	80.4(18.0)	77.8(18.4)	77.4(18.6)	71.9(21.3)	79.2(17.6)
Simultaneous	96.1(9.9)	93.6(16.3)	94.9(12.7)	97.6(7.7)	91.5(17.6)	96.6(9.5)
Correct Latency						
All delays	4130.6(1181.5)	4126.5(1346.2)	4098.9(1275.5)	4462.2(882.6)	4028.8(1500.4)	4167.7(113.6)
Simultaneous	4039.1(2243.6)	4081.1(1435.3)	4032.3(2198.6)	4226.4(1110.9)	4182.2(1603.3)	4012.9(2157.7)
Probability of error given error	0.2(0.2)	0.2(0.3)	0.2(0.2)	0.2(0.3)	0.3(0.2)	0.2(0.2)
Fixed Interval Paradigm						
Response Rate/min	149.1(77.8)	151.0(86.4)	148.2(78.6)	152.9(88.9)	147.6(75.7)	149.6(81.5)
Pre-run Pause Time	1.0(1.1)	1.2(2.9)	1.0(1.1)	1.6(3.4)	0.8(0.8)	1.1(1.9)
Inter-response Time	0.5(0.5)	0.5(1.0)	0.5(0.4)	0.6(1.2)	0.5(0.5)	0.5(0.7)
Self-Control Paradigm						
High Button Choices	0.8(0.2)	0.8(0.2)	0.8(0.2)	0.8(0.2)	0.8(0.2)	0.8(0.2)
High Button Latency (sec)	0.8(0.4)	0.9(0.6)	0.9(0.5)	0.7(0.2)	1.0(0.7)	0.8(0.3)
Paired Associate Learning						
Errors to Success	3.5(4.8)	4.1(6.3)	3.8(5.6)	2.9(3.1)	6.8(8.2)	2.8(3.6)
Trials to Success	2.2(1.4)	2.4(1.8)	2.3(1.6)	2.1(0.9)	3.1(2.3)	2.0(1.1)

Table 12
Means (SDs) for Sensory Motor Endpoints

Test or Task	Risk Factor					
	Neonatal Risk		LD		IQ	
	Low Risk n=227	High Risk n=76	No LD n=244	LD n=49	>84 n=232	≤84 n=61
Scotopic Vision Thresholds						
R^2	0.8(0.2)	0.8(0.2)	0.8(0.2)	0.8(0.2)	0.8(0.3)	0.8(0.2)
Slope	-0.09(0.06)	-0.1(0.07)	-0.09(0.06)	-0.09(0.06)	-0.09(0.07)	-0.1(0.06)
Monitoring and Vigilance (10-15 minute segment)						
Percent Alarms	12.5(15.3)	12.2(15.6)	12.6(14.8)	9.5(12.1)	20.6(24.9)	10.5(11.2)
Percent Hazards	30.1(26.2)	34.7(30.6)	32.2(27.7)	25.0(22.6)	45.0(34.0)	28.09(24.6)
Percent Tracking Errors	16.4(16.2)	16.8(16.0)	17.2(16.1)	12.5(15.2)	24.0(18.9)	14.7(14.8)
Number of Alarms	13.6(8.6)	13.2(7.4)	13.9(8.3)	11.7(7.2)	14.8(9.0)	13.2(8.0)
Alarm Duration (Msecs)	2083.9(1700.4)	3142.0(8383.1)	2469.0(5002.7)	1933.4(1422.7)	3816.9(9725.6)	2016.2(1681.1)
Fine Motor Control						
Reaction Time (Msecs)	1098.2(288.5)	1136.9(358.7)	1105.3(308.3)	1137.0(322.7)	1286.0(393.3)	1062.2(262.8)
Power						
Mrads/sec	3.2(1.7)	3.2(0.09)	3.3(3.0)	3.0(1.3)	4.3(4.3)	2.9(2.0)
Cm/sec	0.1(0.09)	0.09).05)	0.1(0.1)	0.09(0.04)	0.1(0.1)	0.09(0.06)
Frequency						
50% Power	0.7(0.3)	0.7).3)	0.7(0.3)	0.7(0.3)	0.7(0.3)	0.74(0.3)
90% Power	4.1(0.8)	4.1(0.9)	4.1(0.8)	4.1(0.8)	4.0(0.9)	4.2(0.8)

Applying these criteria to the data, we found a total of 18 endpoints (show in Tables 13-15 sorted by the domain they were intended to measure) for predicting IQ grouping, (Table 13), five for predicting LD (Table 14), and six for predicting neonatal status (Table 15).

Table 13
Tests with Sensitivity and Specificity for Predicting IQ

Domain and Test or Task	Interactions	Area Under the ROC Curve for Interaction	Regression Coefficient (SE) for Interaction*	*t*	*p*
Visual and Auditory Information Processing					
DP OAE Amplitude @4000 Hz 70dB	Normal Hearing	0.99	32.3(10.3)	3.1	0.002
Auditory Processing: Pitch Pattern Sequence Test					
	Age		-4.0 (0.67)	-5.9	0.0001
Trials 1+2 Correct + Reversed	Normal Hearing	>0.84	18.8(9.1)	2.1	0.04
Trials 1+2 Correct Only	Age	>0.86	-3.0(1.0)	-2.9	0.004
Trials 1+2 Gesture – Verbal Correct + Reversed	None	0.72	-2.9(0.6)	-5.3	0.0001
Perceptual Motor					
Monitoring and Vigilance					
Average Tracking Error	Age	> 0.73	2.9(1.2)	2.4	0.02
	Video Game Experience with or without Computer Experience	>0.79	-24.5(11.0)	-2.2	0.03
% Hazard 10-15 min	Neither Video Game nor Computer Experience	0.90	40.6(17.8)	2.3	0.2
Fine Motor					
Fine Motor Control					
Average RT	Left Hand	0.87	279.1(116.0)	2.4	0.02
Power mrads/sec	Females	0.75	1.7(0.8)	2.1	0.04
Cognitive					
P300 Amplitude Cz	High Neonatal Risk	0.71	-7.3(3.1)	-2.3	0.02
Mean CPT RT		0.70	-50.3(25.8)	-1.9	0.05
CANTAB Tasks					
Self-Control Paradigm					
Total Choices: High Reward, Long Delay	High Neonatal Risk with or without Video Game Experience		0.2(0.06)	2.3	0.2
Mdn Latency: High Button Choices	Children < 13 Regardless of Computer Experience or Neonatal Risk	>0.76	0.2(0.4)	3.9	0.0001
Paired Associate Learning					
	Video Game Experience with or without Computer Experience	>0.79	-8.6(2.2)	-3.9	0.0001
Average Errors to Success	Neither Video Game nor Computer Experience	0.93	13.1(4.2)	3.1	0.002
Average Trials to Success	Video Experience	0.79	-2.1(0.6)	-3.3	0.001
Intra- and Extra-dimensional Shift					
Total Trials	High Neonatal Risk and LD	0.89	-85.8(40.0)	-2.1	0.03
Total Errors		0.88	-49.8(23.0)	-2.2	0.03
Stages Completed		0.89	2.9(1.0)	2.8	0.005
Delayed Match-to-Sample % Correct Long Delay	Video Game Experience	0.78	23.7(9.9)	2.4	0.02

Table 14
Tests with High Sensitivity and Specificity for Predicting Learning Disability

Domain and Test or Task	Interactions	Area Under the ROC Curve for Interaction	Regression Coefficient (SE) for Interaction*	*t*	*p*
Visual and Auditory Information Processing					
DP OAE Amplitude @6000 Hz 70dB	Normal Hearing	>0.72	22.5(10.5)	2.1	0.03
Fine Motor					
Fine Motor Control					
Average RT	High Neonatal Risk	0.71	240.8(105.1)	2.3	0.02
Cognitive					
Mean CPT RT	Non-preferred Hand	0.70	62.2(27.4)	2.3	0.02
CANTAB Tasks					
Fixed Interval Paradigm					
Median Inter-response Time	High Neonatal Risk	>0.77	0.03(0.02)	2.07	0.04
Median Pauses to the Final One	High Neonatal Risk	0.80	1.8(0.7)	2.7	0.008

Table 15
Tests with High Sensitivity and Specificity for Predicting Neonatal Risk Status

Domain and Test or Task	Interactions	Area Under the ROC Curve for Interaction	Regression Coefficient (SE) for Interaction*	*t*	*p*
Visual and Auditory Information Processing					
Pitch Pattern Sequence Test					
Trials 1+2 Correct + Reversed	Normal Hearing	0.93	17.9(7.6)	2.4	0.02
Trials 1+2 Correct Only	Normal Hearing	0.88	20.1(10.3)	1.9	0.05
Perceptual Motor					
Monitoring and Vigilance					
Percent Alarms 10-15 minutes	No Computer Experience	0.88	-20.5(9.2)	-2.2	0.03
Cognitive					
CANTAB Tasks					
Self-Control Paradigm					
Mdn Latency: High Button Choices	No Computer Experience	1.00	-2.6(0.3	-7.9	0.0001
Fixed Interval Paradigm					
Median Pauses to the Final One	LD	0.76	1.8(0.7)	2.7	0.007
Paired Associate Learning					
Average Errors to Success	No Computer Experience with or without Video Experience	>0.76	-3.0(1.1)	2.5	0.01

Each table shows the specific test or task (Column 1) and the covariates that significantly influenced the AUC, i.e., interacted with risk status (Column 2). The area or areas under the ROC curve accounted for by each level of each interaction are shown in Column 3 and the regression statistics for these interactions are shown in Columns 4 through 6. Plots of the ROC analyses summarized in Tables 12, 13 and 14 are shown in Figures 6 through 33. Each figure caption indicates the AUC for each of the ROC curves plotted. ROC curves estimating prediction of LD by BAER Amplitude at 6000 Hz for 70 dB were influenced by gender, neonatal risk status and hearing status. Because of the complexity of these data we have plotted the ROC curves on two figures, one for females (Fig. 24a) and the other for males (Fig. 24b). All ROC curves for each other endpoint are plotted on the same axis.

These data indicate that the test battery was best capable of predicting IQ differences. Only a very small number of tasks and tests had acceptable sensitivity and specificity for predicting either learning disability or neonatal status. The CANTAB tasks seemed to hold the most promise for future use in predicting subtle neurodevelopmental differences. Both the FI/Self Control paradigms and most of the traditional CANTAB paradigms had high sensitivity and specificity.

There was some overlap in endpoints that satisfactorily predicted more than one risk category, mainly between the CANTAB and auditory processing tasks. The electrophysiological endpoints that yielded acceptable prediction capacity did so only for low IQ and LD, and only the tremor and the multitasking tasks showed acceptable detection capacity.

The battery seemed to perform better for younger children, at least where age was found to interact with the risk factor. This was not a universal finding however. Likewise computer and video game experience appeared to influence detection capacity for only some of the computerized tasks. Among the auditory processing tasks only the Pitch-Pattern Sequence Test had acceptable sensitivity and specificity, and hearing was clearly necessary for this and other auditory tasks to perform well.

Intercorrelations were computed among tasks and tests listed in Tables 13, 14 and 15 that tested like developmental domains using the Spearman procedure. These data are shown in Tables 15 through 18. Large numbers of these correlations were significant. We have therefore asterisked **only those that were not significant in Tables 16-19**. In general these data suggest that measures within the same test or task were highly correlated. There was less interdependence across tests within the same domain and across domains.

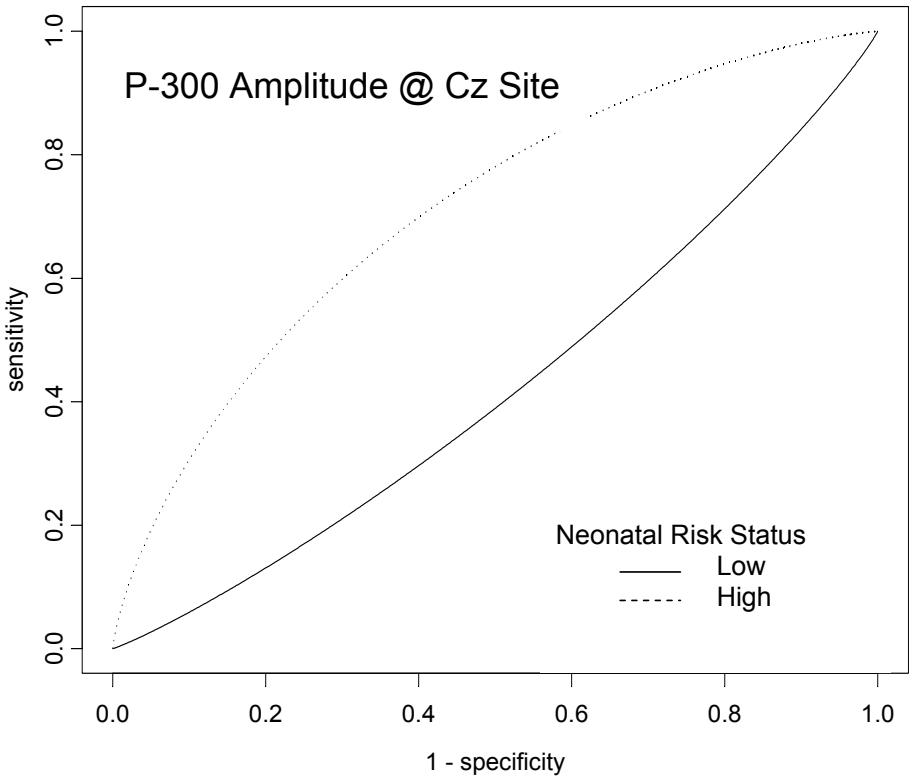

Fig. 6. Prediction of IQ by P-300 Amplitude at Cz Site. Prediction of IQ was dependent upon on neonatal risk status. The areas under these ROC curves are 0.4213, 0.7078.

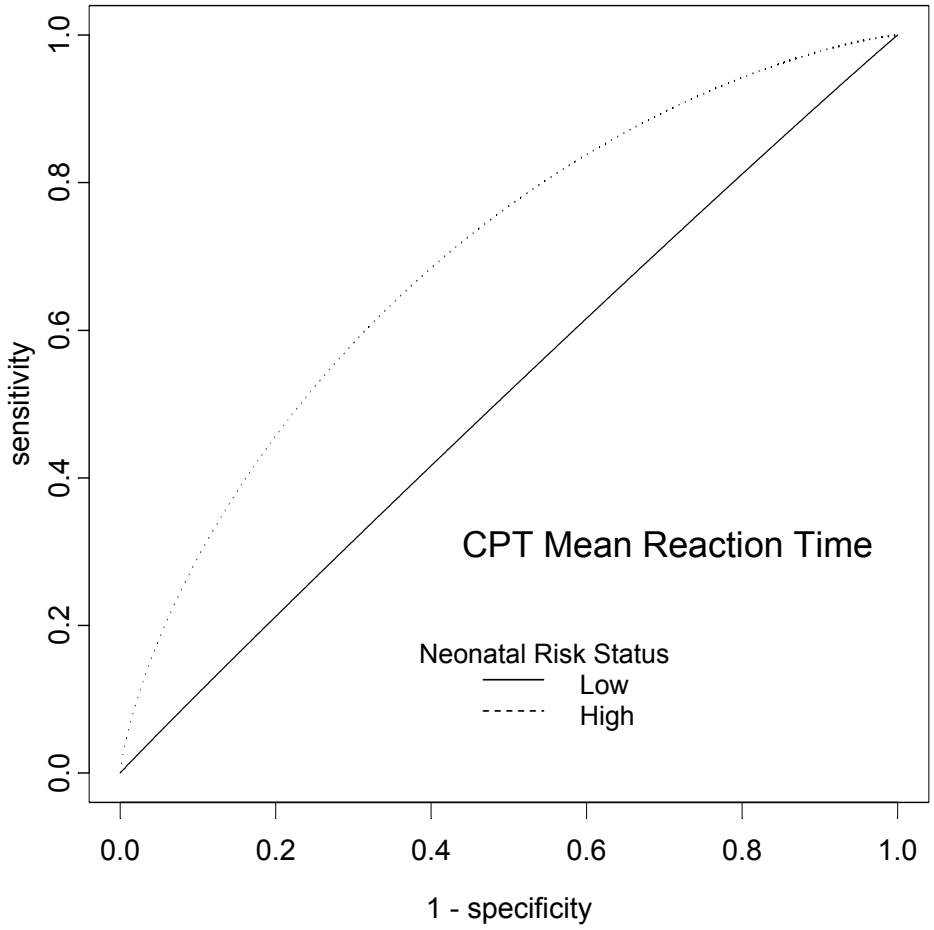

Fig.7. Prediction of IQ by Continuous Performance Task Mean Reaction Time for Correct Responses. Prediction of IQ was dependent upon on neonatal risk. The areas under these ROC curves are 0.5119, 0.6979.

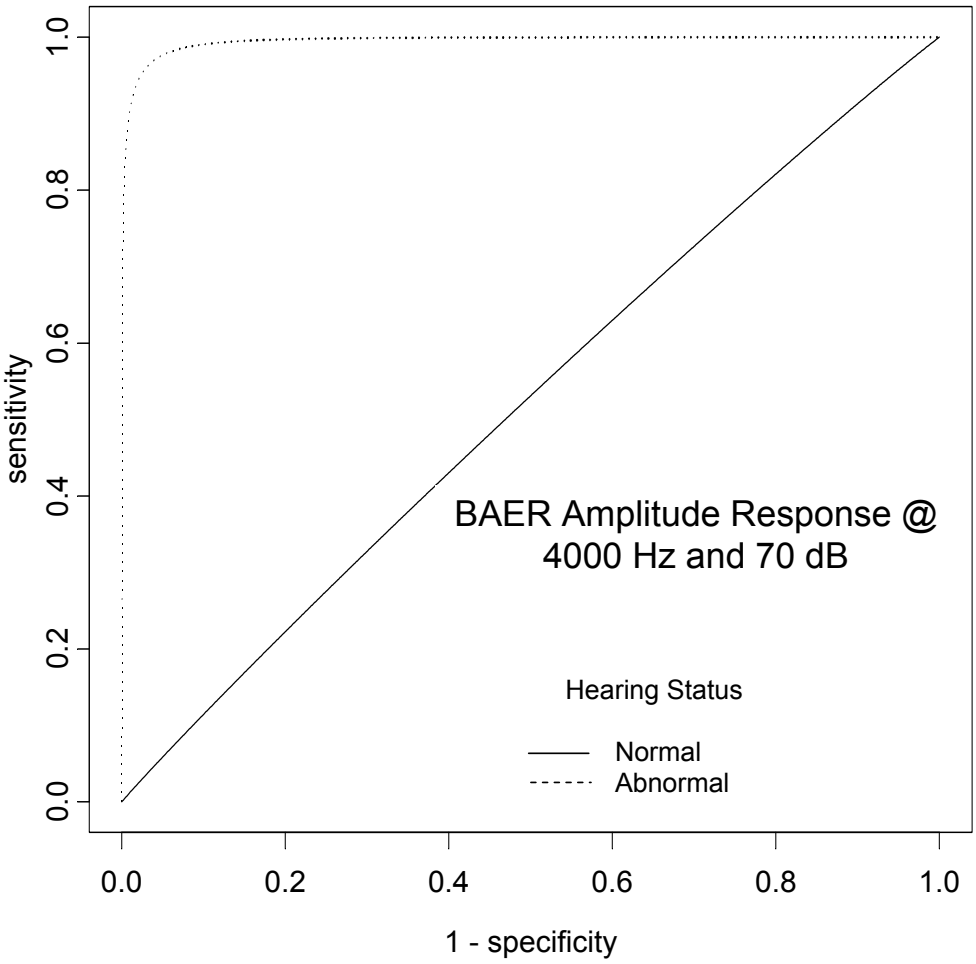

Fig.8. Prediction of IQ by BAER Amplitude Response at 4000Hz at 70 dB. Prediction was dependent upon hearing status. The areas under these ROC curves are 0.5220, 0.9949.

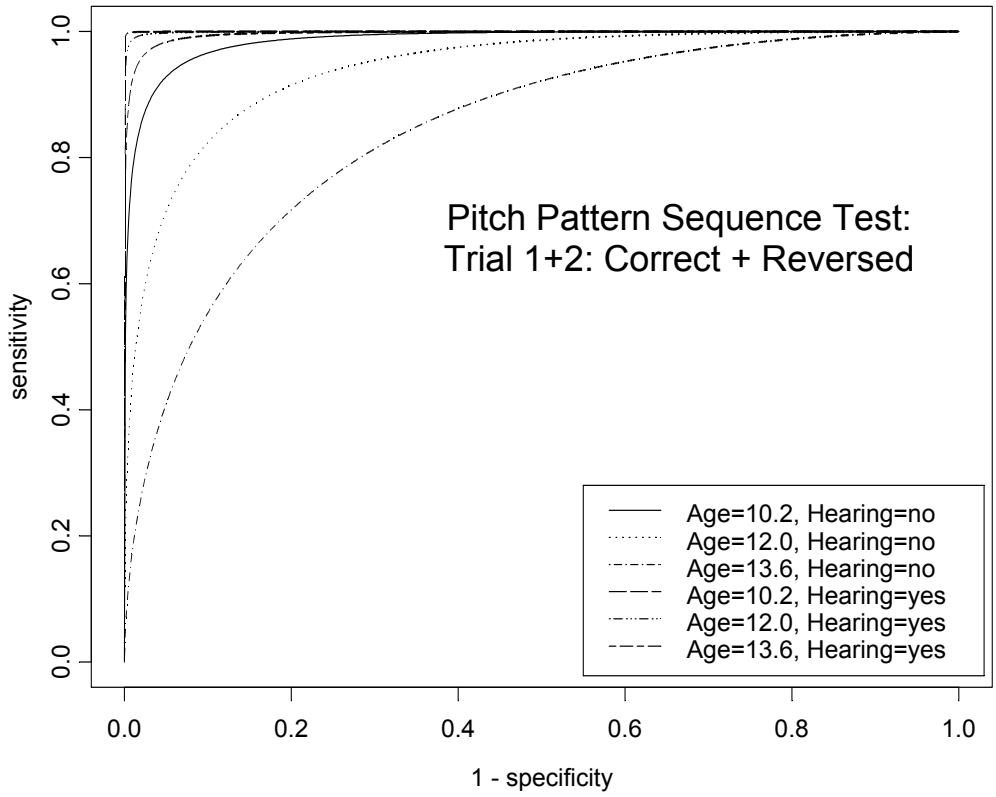

Fig. 9. Prediction of IQ by Pitch Pattern Test, Trials 1 and 2, Correct + Reversed. Prediction was influenced by both the child's age and his or her hearing status. The areas under the ROC curve are 0.9860, 0.9411, 0.8417, 0.9999, 0.9994, 0.9962. Hearing Status of "no" means normal and "yes" means abnormal.

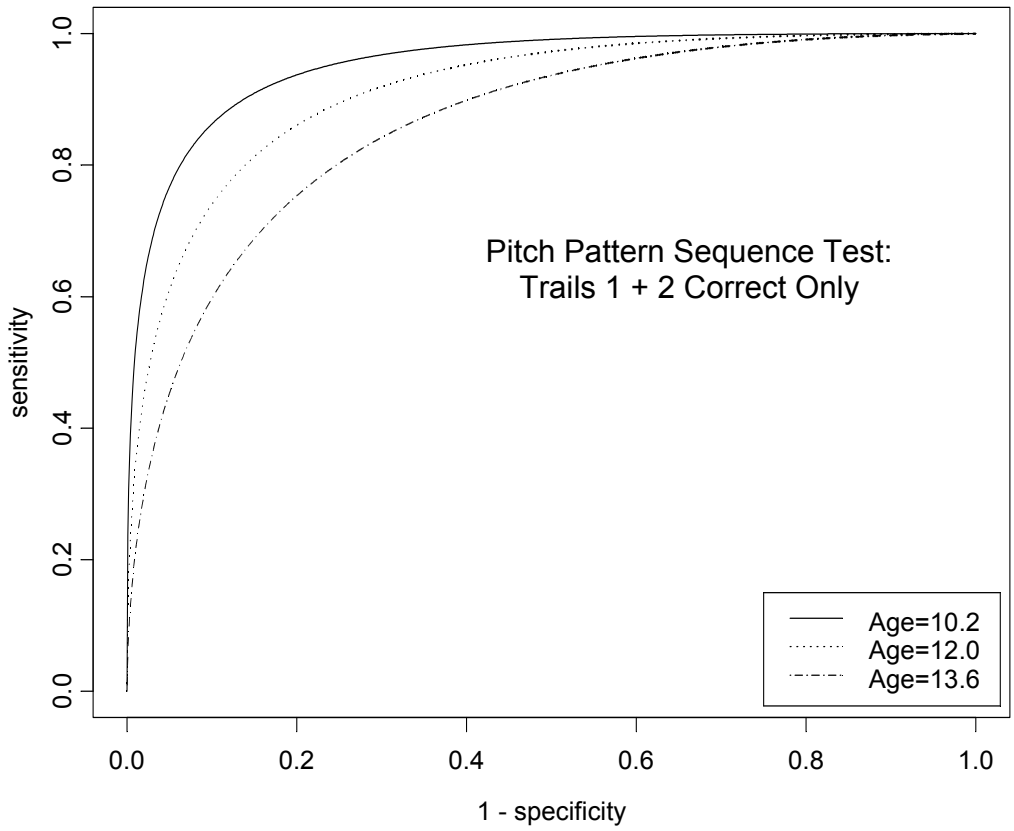

Fig. 10. Prediction of IQ by Pitch Pattern Test, Trials 1 and 2, Correct Only. Prediction was influenced by the child's age. The areas under the ROC curves are 0.9533, 0.9133, 0.8599.

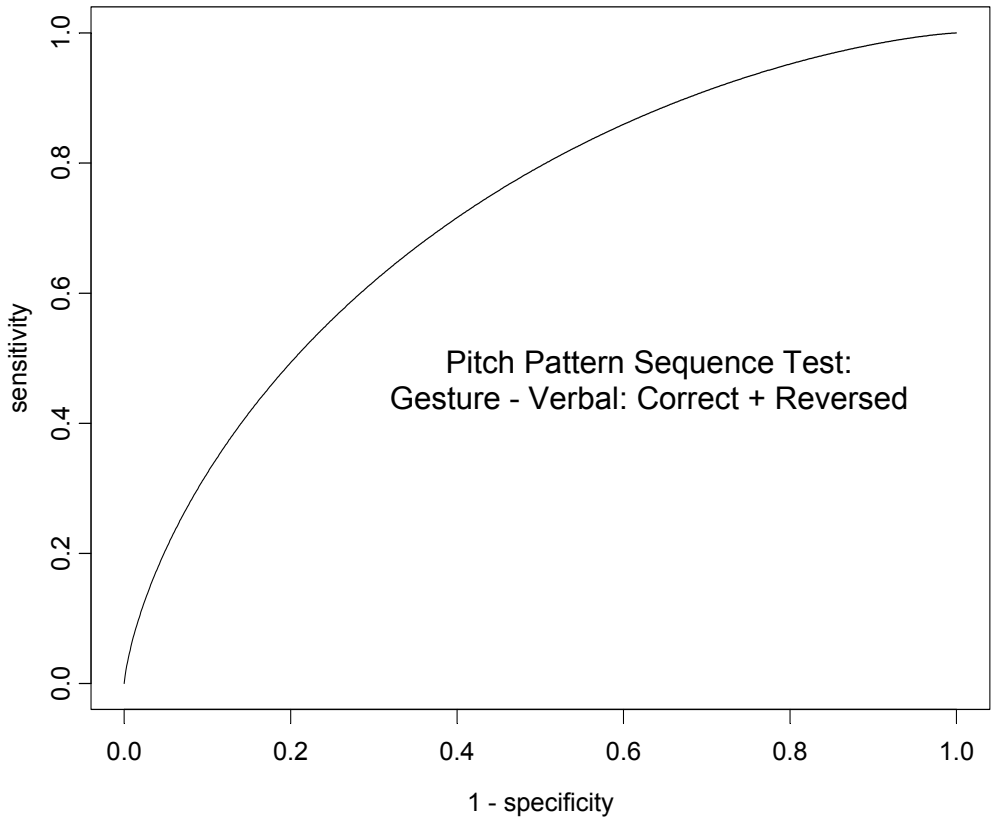

Fig. 11. Prediction of IQ by the Pitch Pattern Test, Gesture – Verbal, Correct + Reversed. Prediction was unaffected by any covariates. The area under the curve was 0.7201.

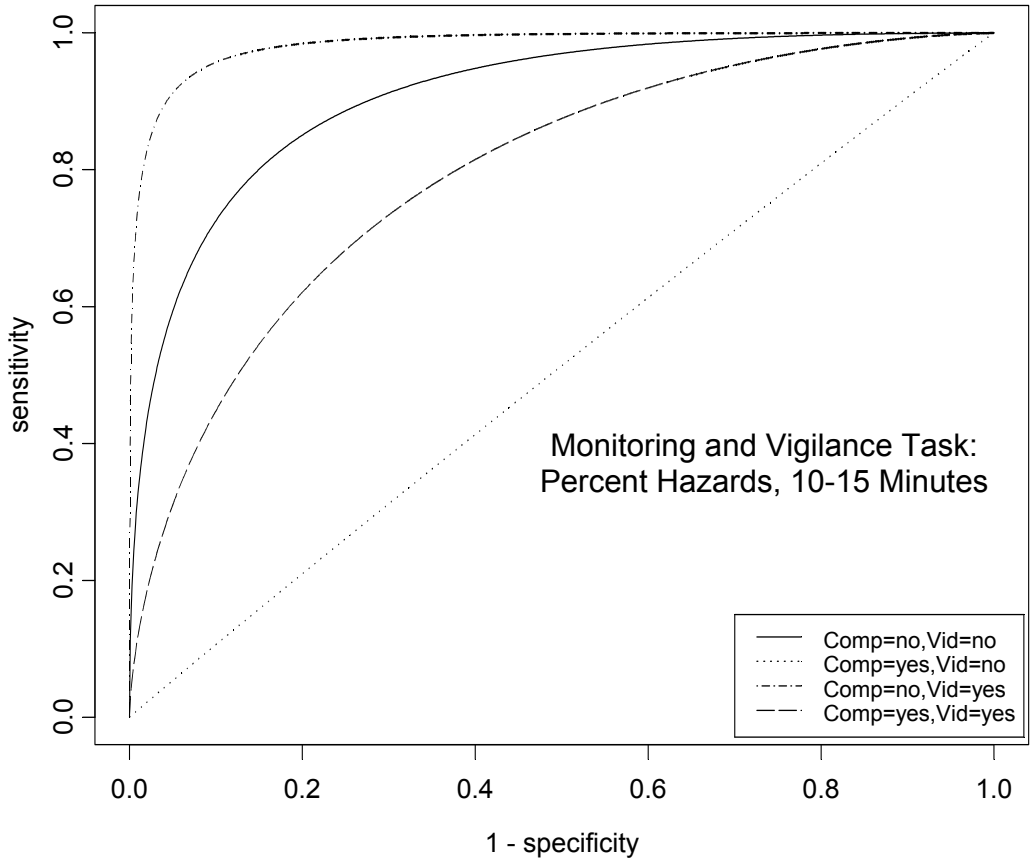

Fig. 12. Prediction of IQ by Monitoring and Vigilance Task, Percent Hazards, 10-15 Minutes. Prediction was influenced by experience with computer manipulanda (Comp), and by experience playing video games (Vid). The areas under the ROC curves are (A) 0.9083, 0.5096, 0.9829, 0.7918.

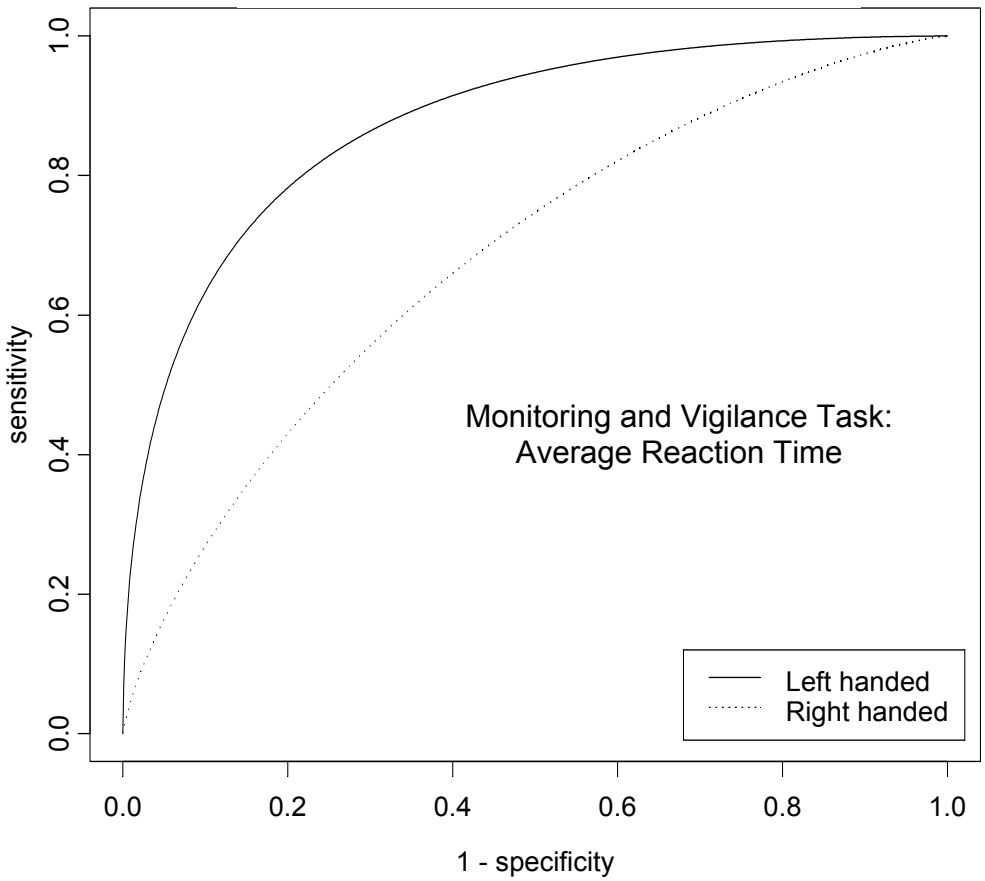

Fig. 13. Prediction of IQ by Monitoring and Vigilance Task, Average Reaction Time. Prediction was affected by the subject's hand preference. The areas under the ROC curves are 0.8743, 0.6809.

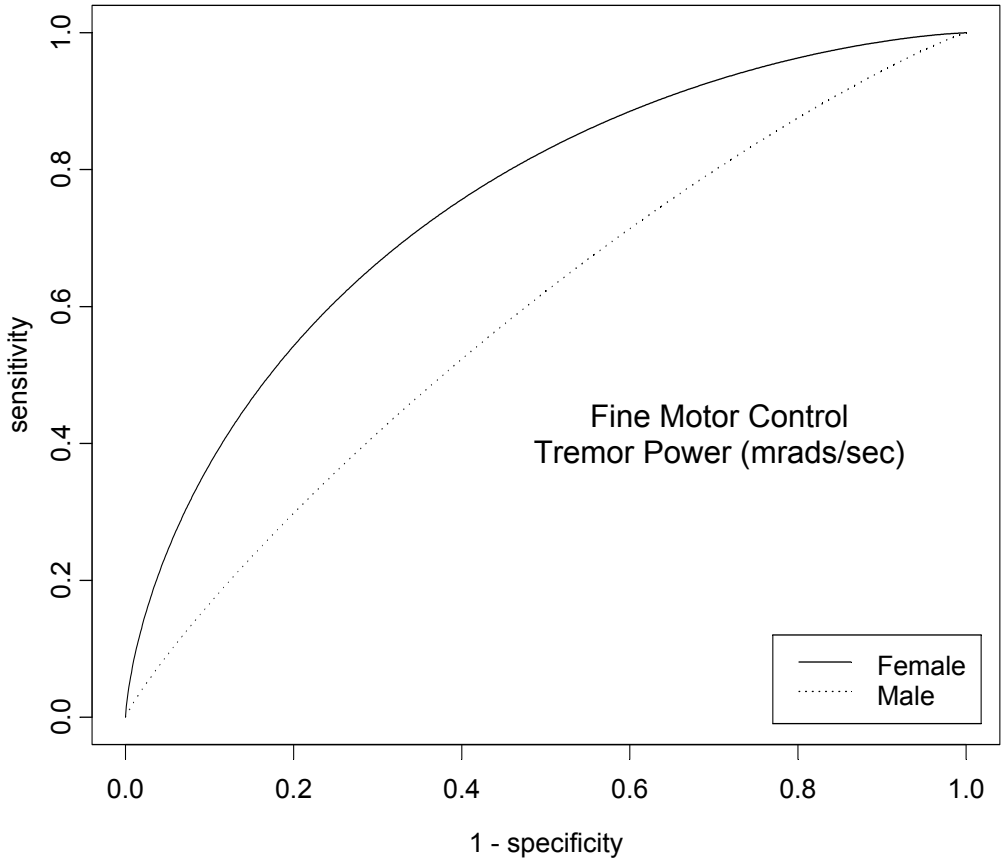

Fig. 14. Prediction of IQ by Fine Motor Control Task Termor Power. Prediction was influenced by subject's gender. The areas under the ROC curves are 0.7487, 0.5872.

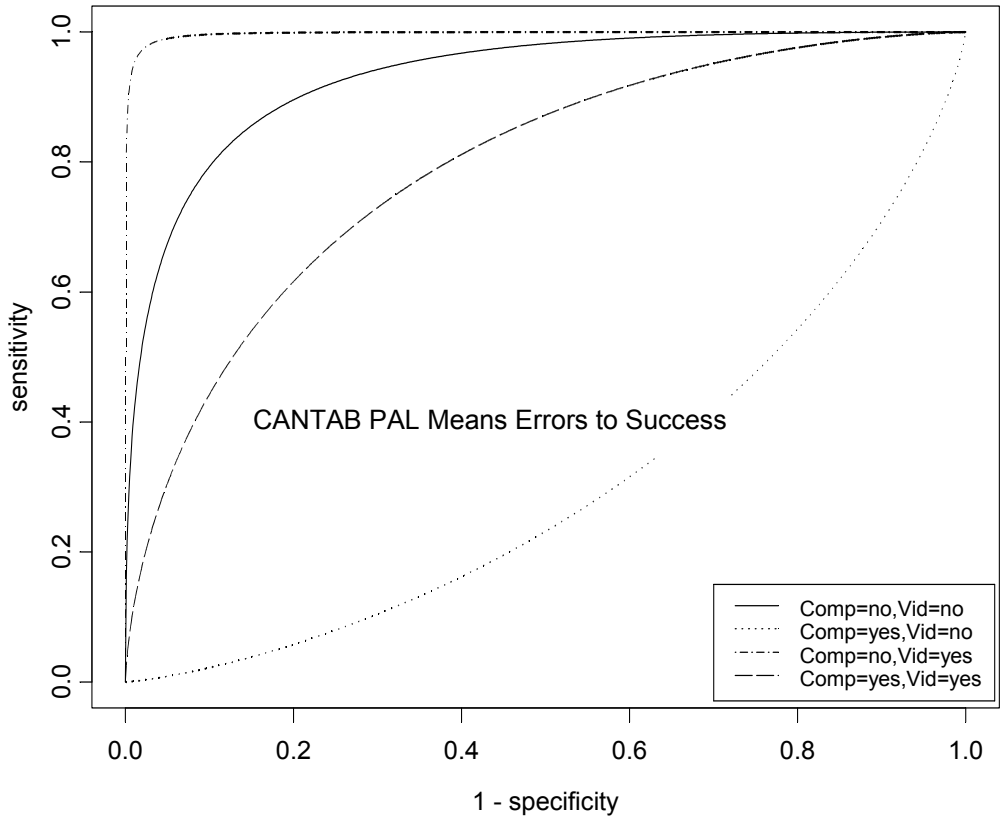

Fig. 15. Prediction of IQ by CANTAB Paired Associate Learning Task Mean Errors to Success. Prediction was influenced by experience with computer manipulanda (Comp) and experience playing video games (Vid). The areas under the ROC curves are 0.9311, 0.3019, 0.9975, 0.7891.

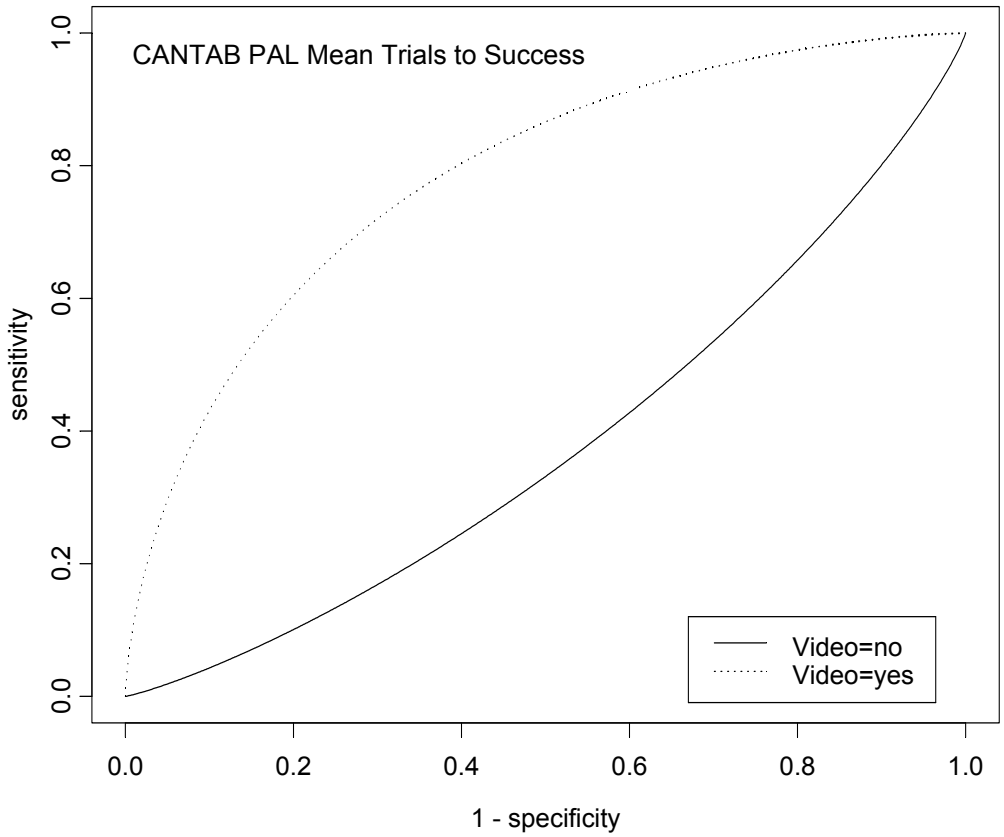

Fig. 16. Prediction of IQ by CANTAB Paired Associate Learning Task Mean Trials to Success. Prediction was influenced by experience playing video games. The areas under the ROC curves are 0.3790, 0.7831.

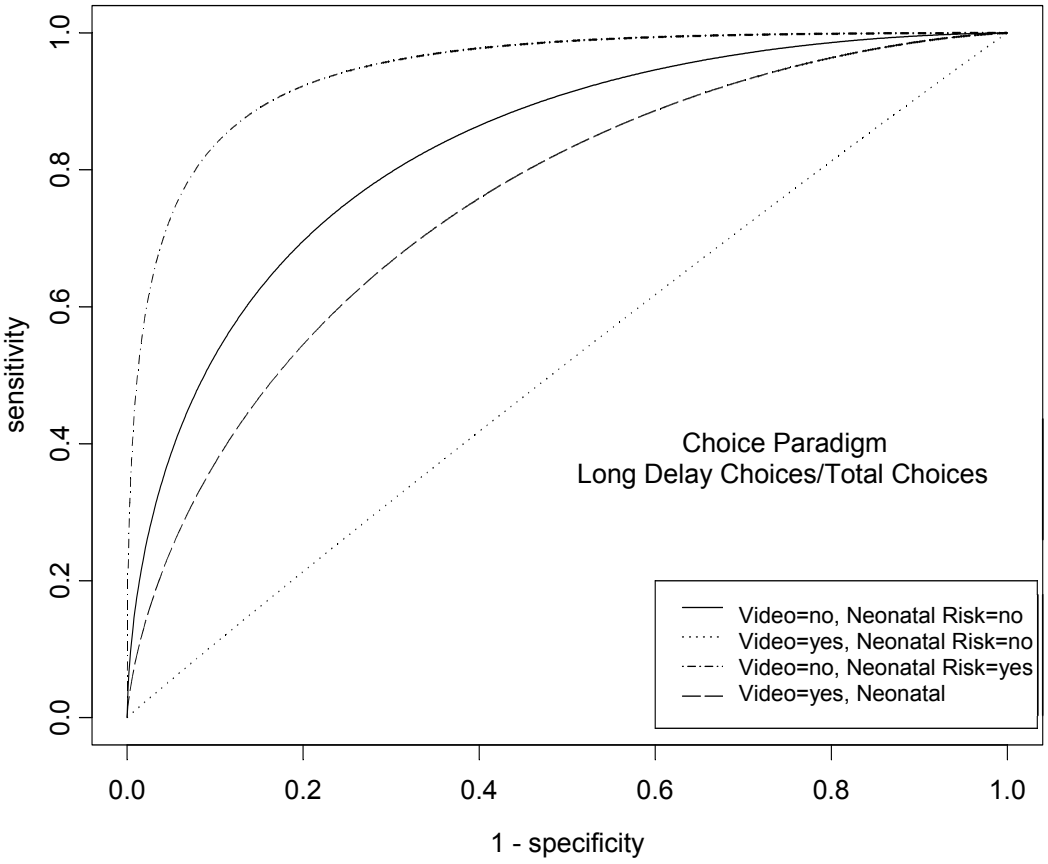

Fig. 17. Prediction of IQ by Choice Paradigm, Long Delay Choices/Total Choices. Prediction was influenced by experience playing video games and by neonatal risk status. The areas under the ROC curves are 0.8309, 0.5130, 0.9452, 0.7501.

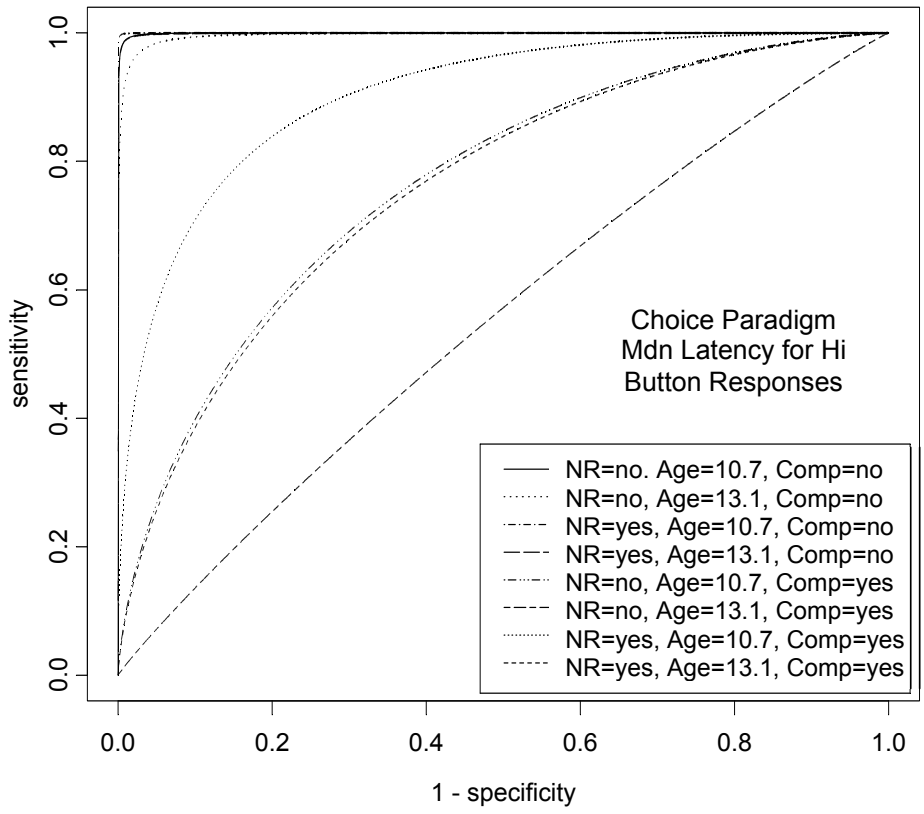

Fig. 18. Prediction of IQ by Choice Paradigm Median Latency for Hi Button Responses. Prediction was influenced by neonatal risk status (NR), experience with computer manipulanda (Comp) and age. The areas under the ROC curves are 0.9995, 0.9963, 0.9999, 0.9994, 0.7653, 0.5512, 0.9023, 0.7581.

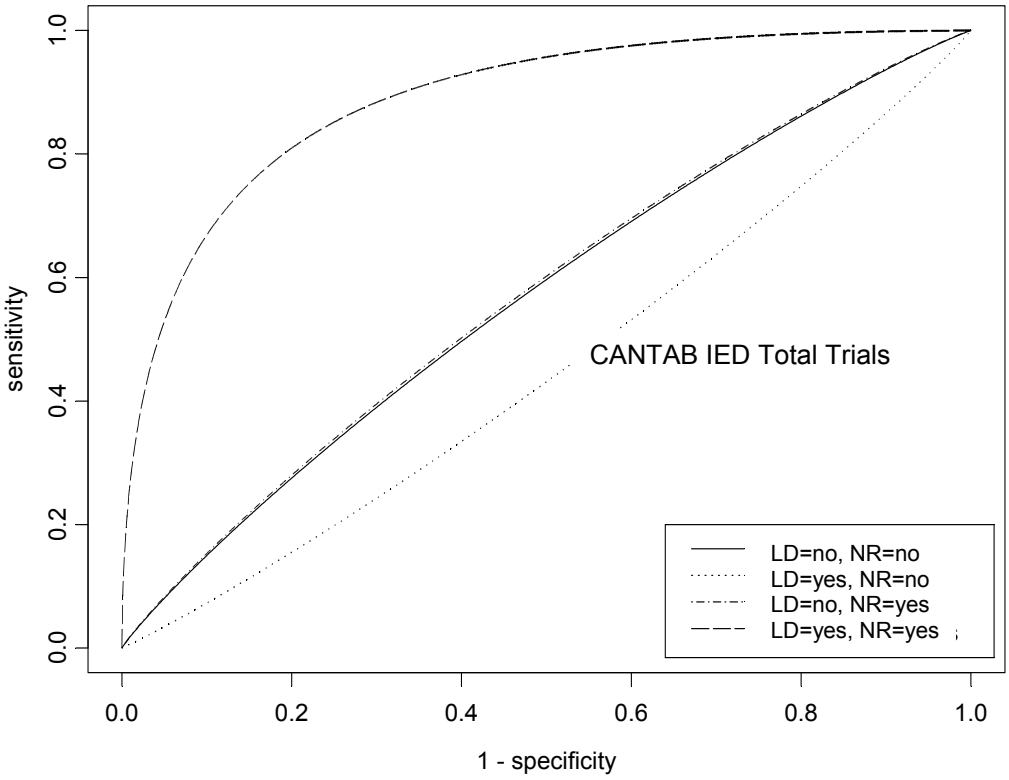

Fig. 19. Prediction of IQ by CANTAB IED Trials Score. Prediction was influenced by LD status (LD) and neonatal risk (NR) status. The areas under the ROC curves are 0.5687, 0.4511, 0.5726, 0.8878.

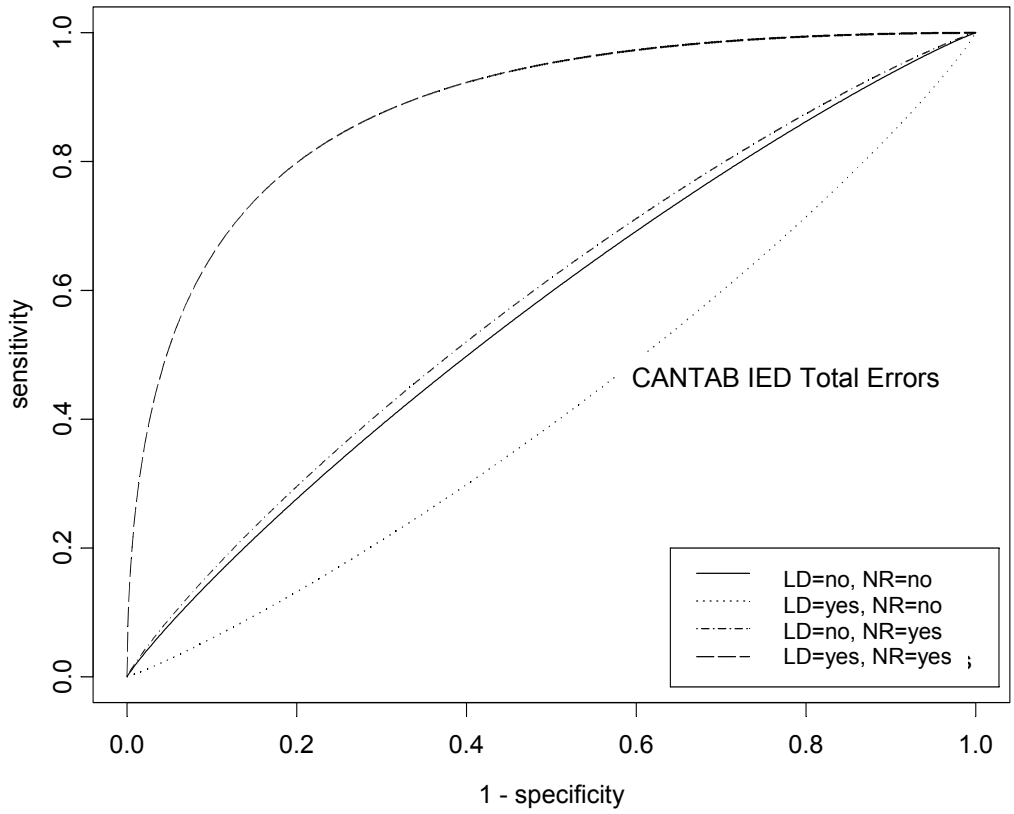

Fig. 20. Prediction of IQ by CANTAB IED Total Error Score. Prediction was influenced by LD status (LD) and neonatal risk (NR) status. The areas under the ROC curves are 0.5696, 0.4227, 0.5851, 0.8820.

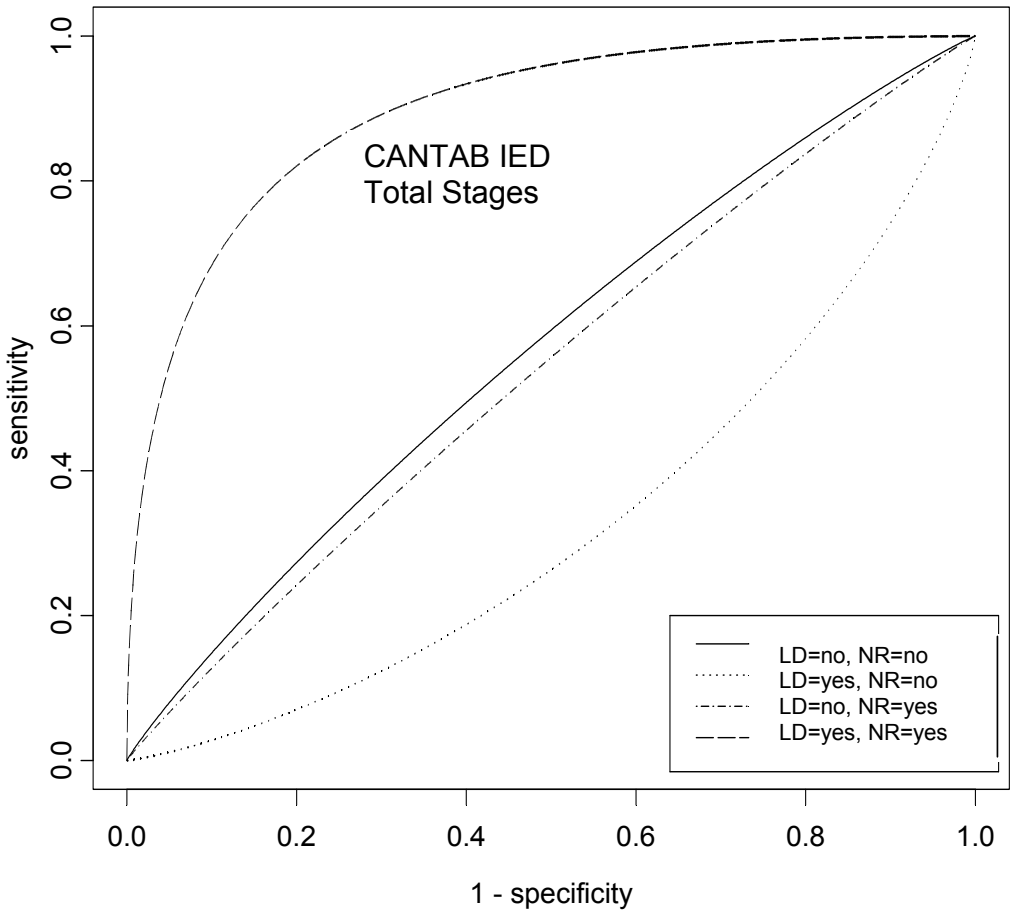

Fig. 21. Prediction of IQ by CANTAB IED Stages Score. Prediction was influenced by LD status (LD) and neonatal risk (NR) status. The areas under the ROC curves are 0.5669, 0.3270, 0.5399, 0.8932.

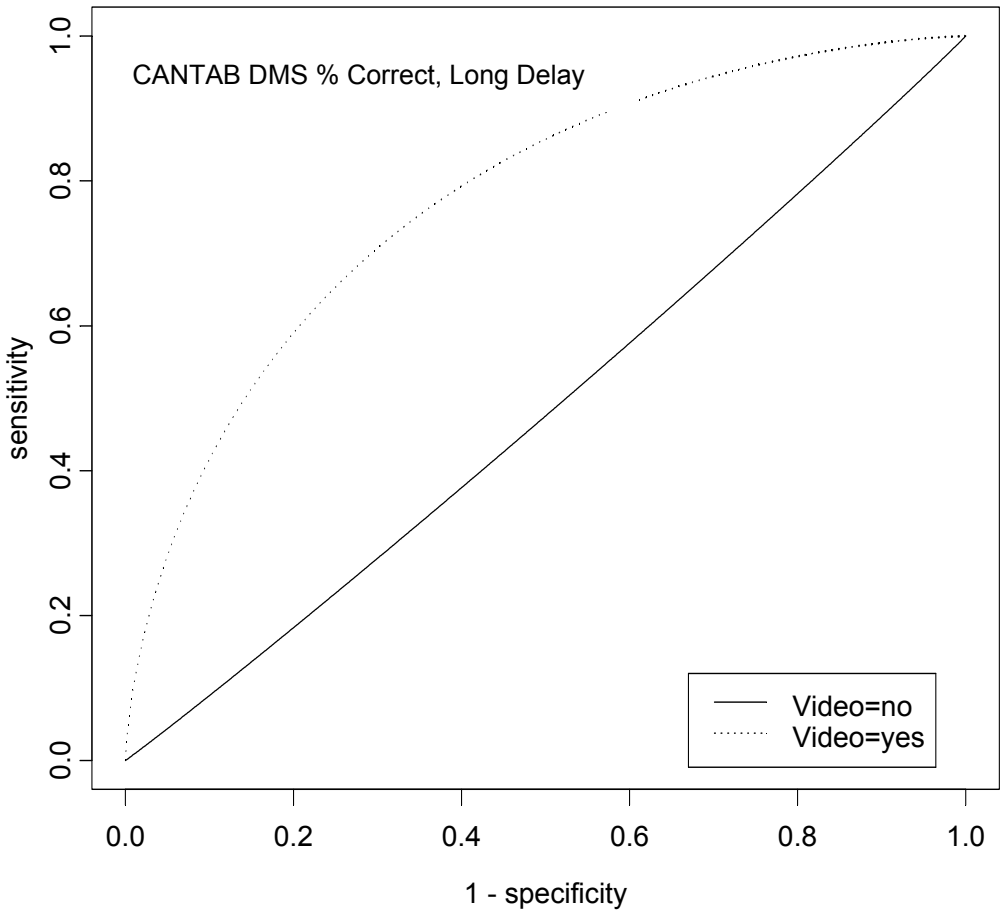

Fig. 22. Prediction of IQ by CANTAB DMS Task Percent Correct, Long Delay. Prediction was affected by experience playing video games. The areas under the ROC curves are 0.4827, 0.7752.

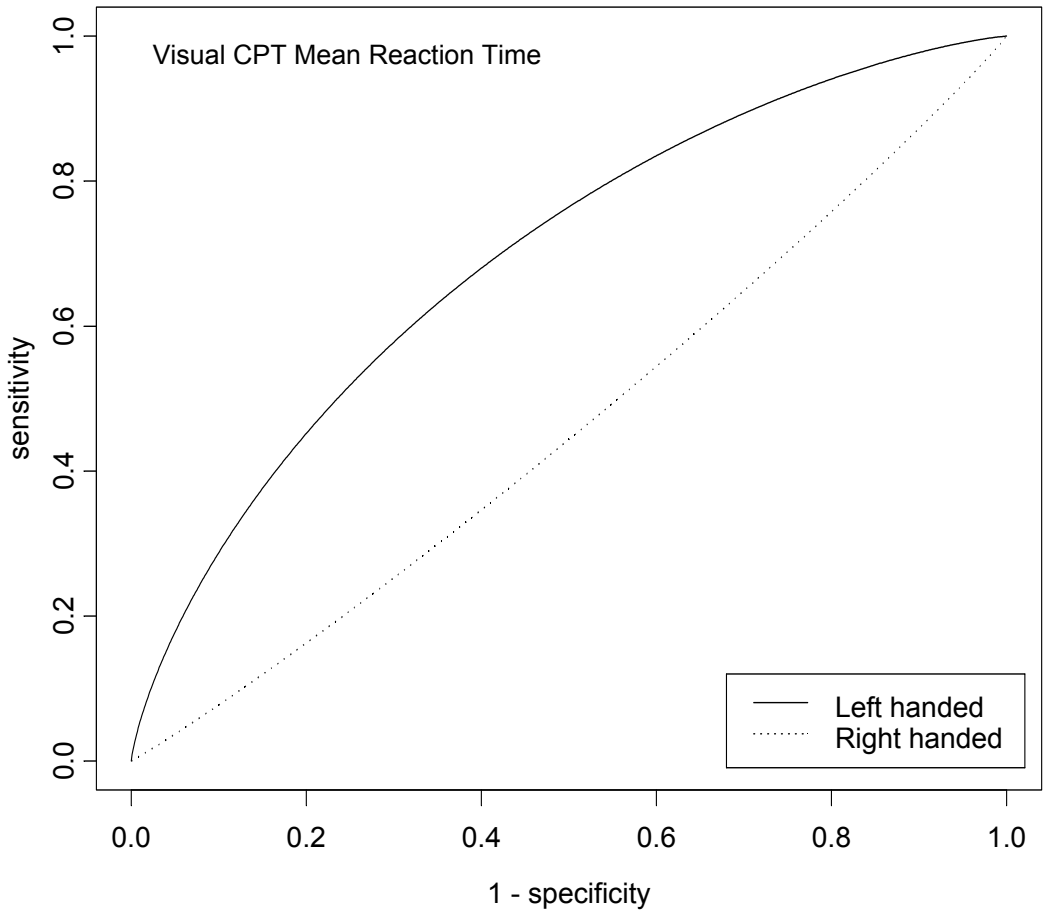

Fig. 23. Prediction of LD by Visual CPT Mean Reaction Time. Prediction was influenced by the subject's hand preference. The areas under the ROC curves are 0.6949, 0.4600.

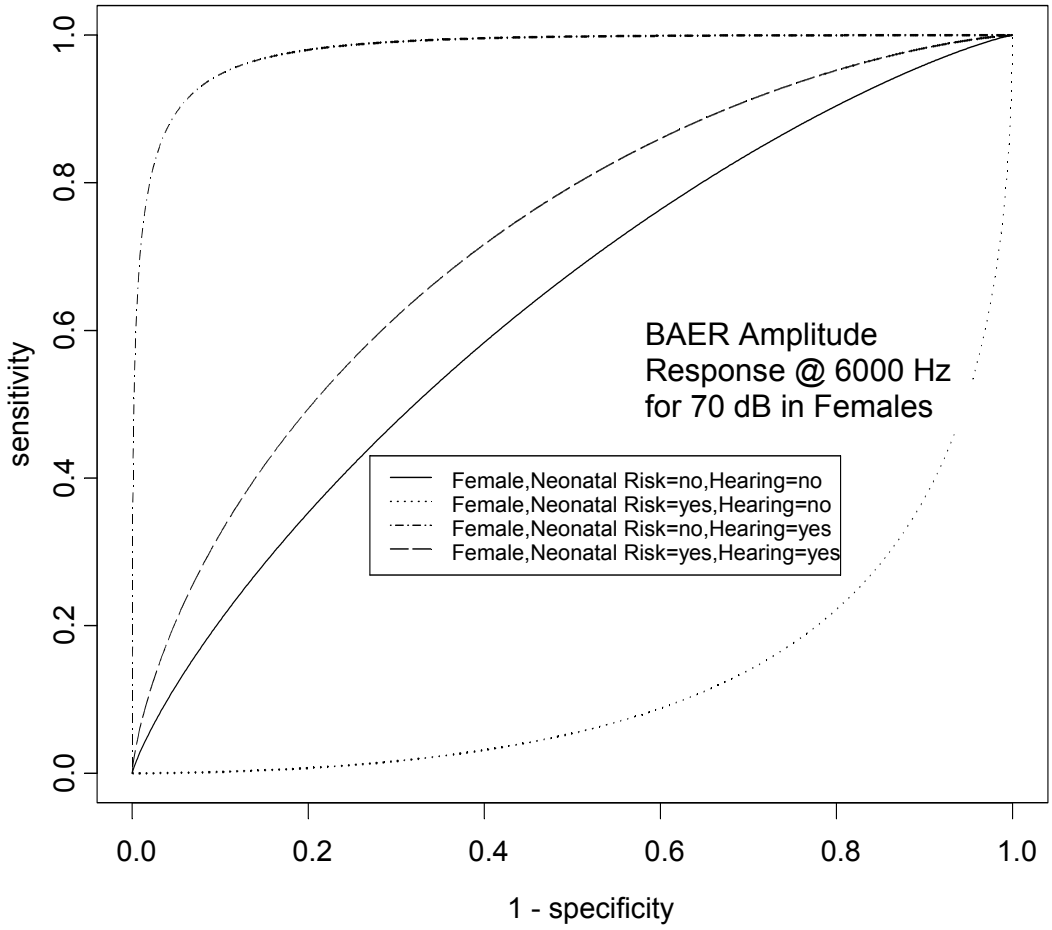

Fig. 24a. Prediction of LD in Females by BAER Amplitude Response at 6000Hz for 70 dB. Prediction was influenced by neonatal risk, and hearing status. The areas under these ROC curves are 0.6287, 0.5186, 0.1279, 0.5736.

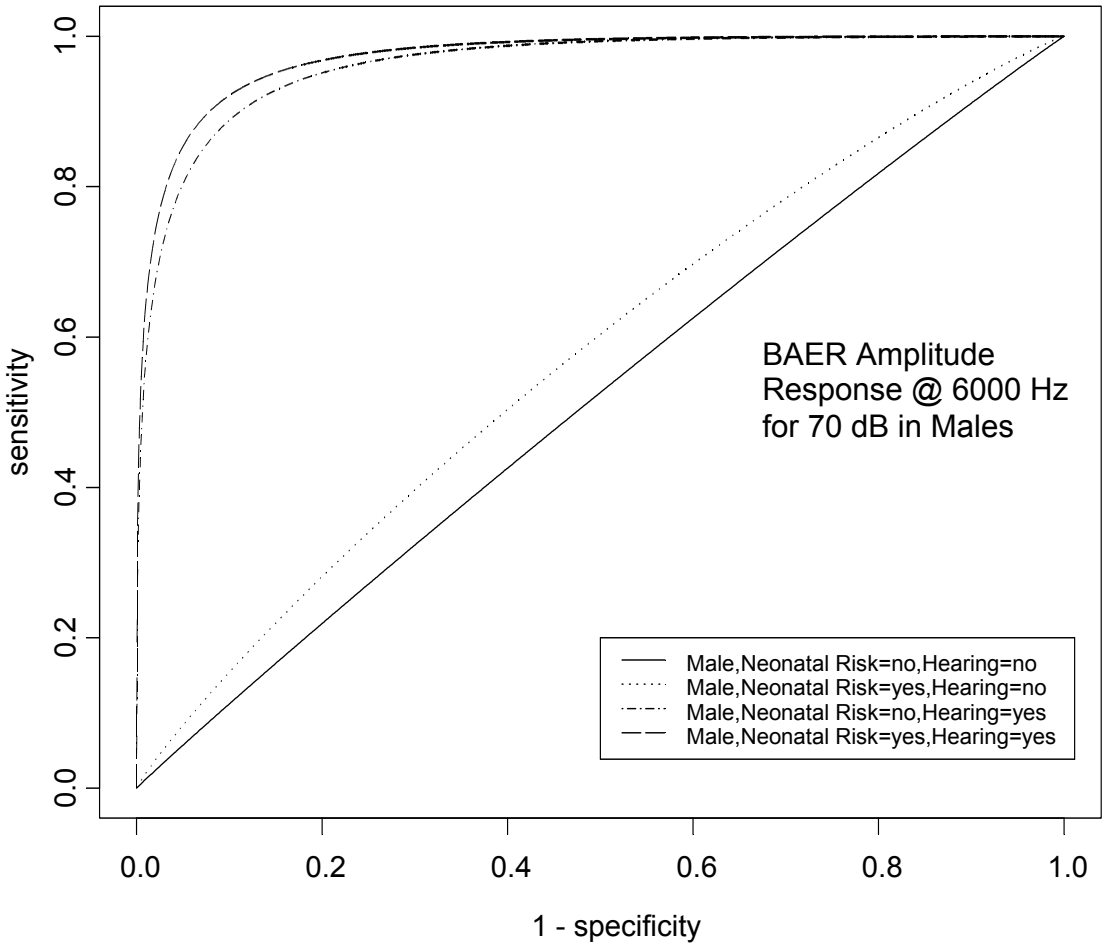

Fig. 24b. Prediction of LD in Males by BAER Amplitude Response at 6000Hz for 70 dB. Prediction was influenced by neonatal risk, and hearing status. The areas under the ROC curves are 0.9798, 0.9614, 0.7204, 0.9717.

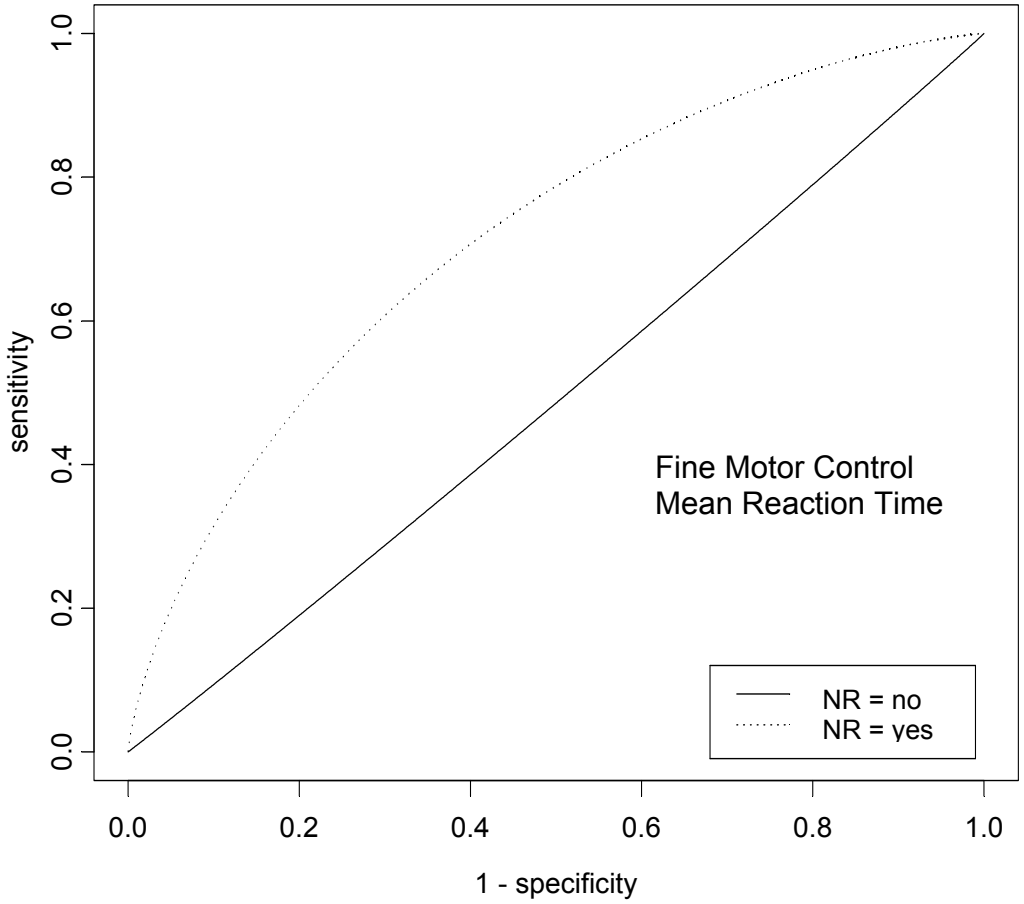

Fig. 25. Prediction of LD by Fine Motor Control Mean Reaction Time. Prediction was influenced by neonatal risk status. The areas under the ROC curves are 0.4897, 0.7134.

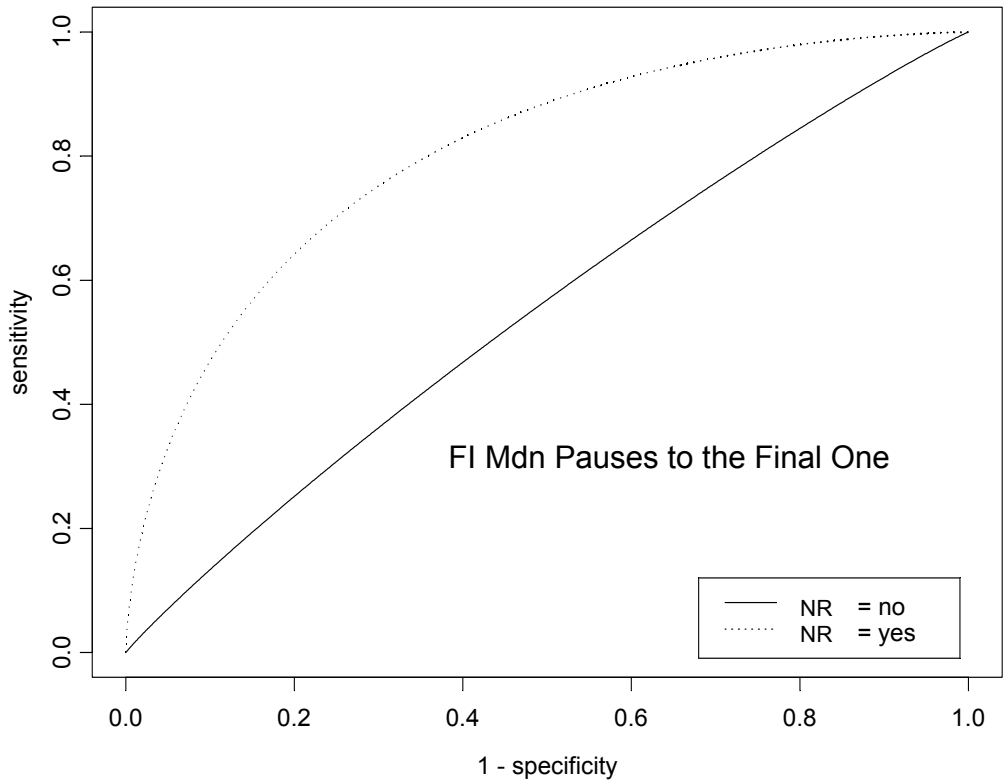

Fig. 26. Prediction of LD by FI Median Pauses to the Final One. Prediction was influenced by neonatal risk (NR). The areas under the ROC curves are 0.5485, 0.8029.

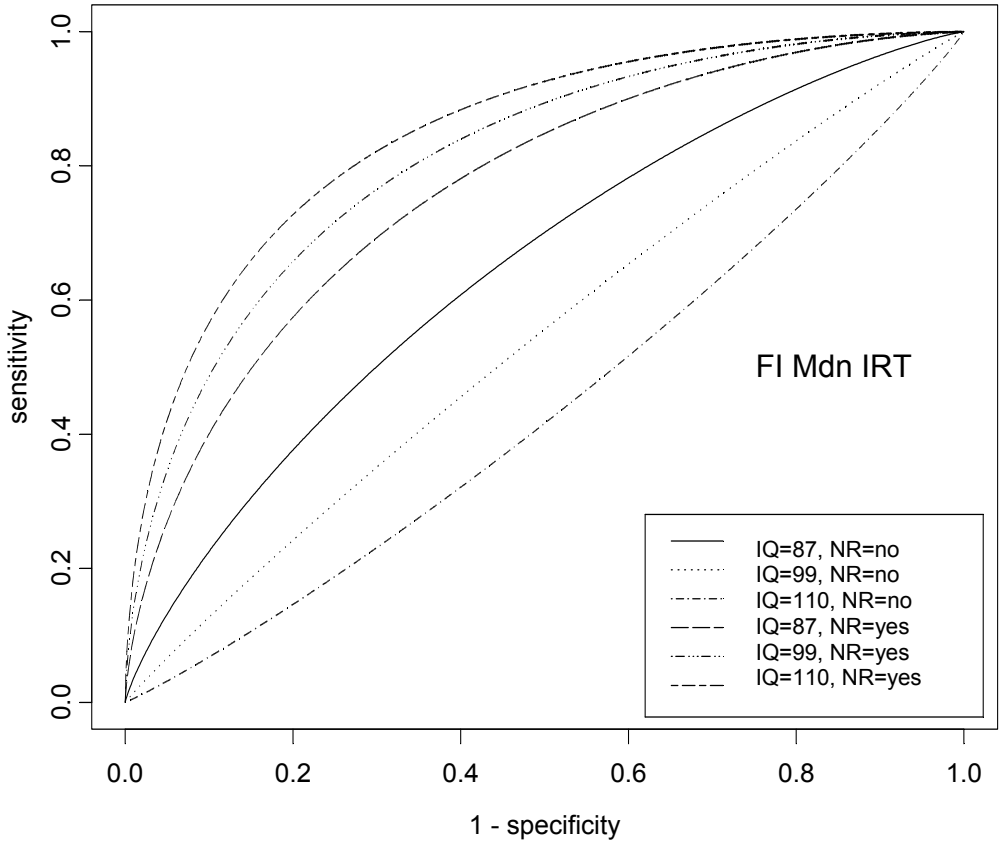

Fig. 27. Prediction of LD by FI Task Median Inter-response Time (IRT). Prediction was influenced by IQ and neonatal risk (NR). The areas under the ROC curves are 0.6451, 0.5398, 0.4404, 0.7665, 0.8109, 0.8468.

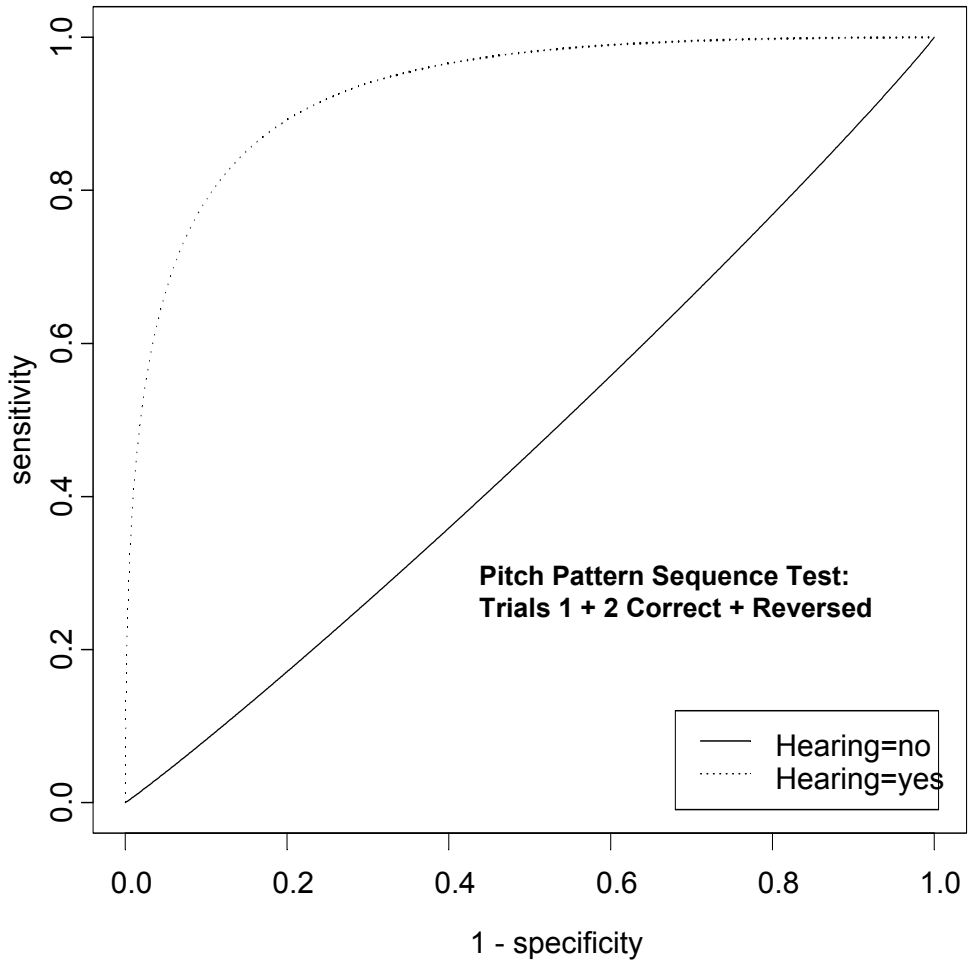

Fig. 28. Prediction of Neonatal Risk by Pitch Pattern Test Trials 1+2, Correct + Reversed. Prediction was influenced by hearing status. The areas under the ROC curves are 0.4694, 0.9292.

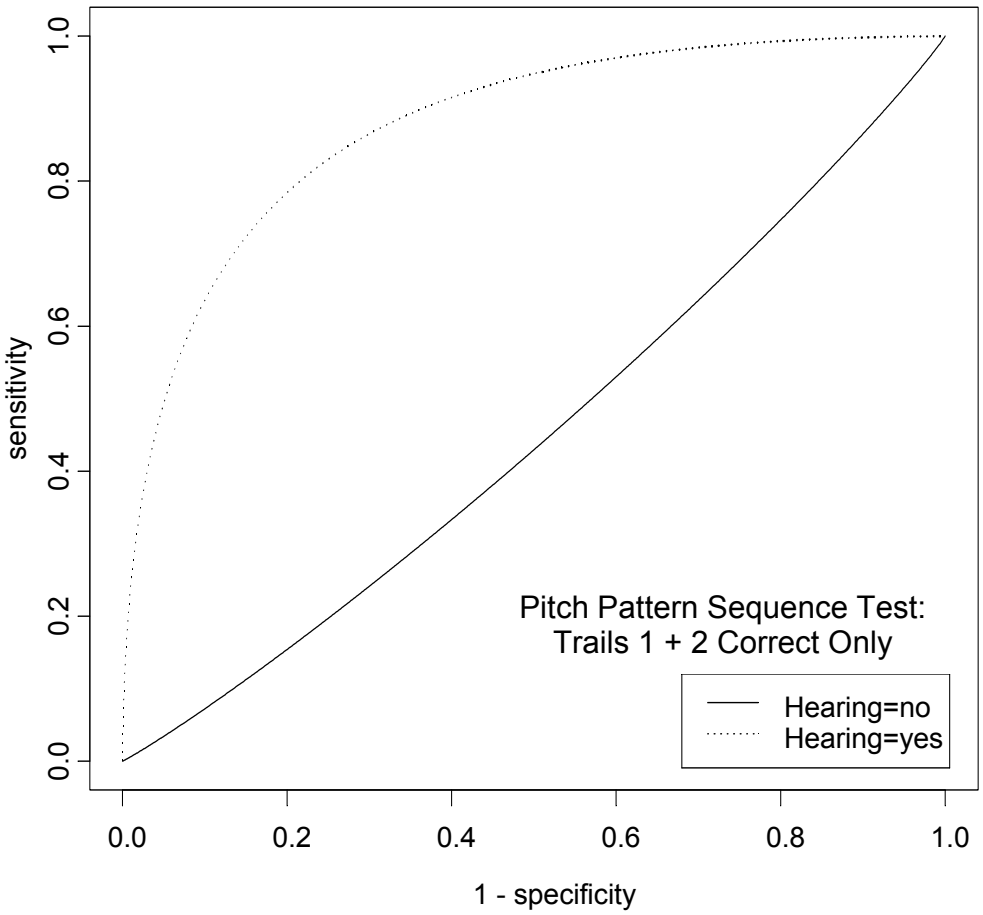

Fig. 29. Prediction of Neonatal Risk by Pitch Pattern Sequence Test Trials 1 + 2 Correct Only. Prediction was influenced by hearing status. The areas under the ROC curves are 0.4500, 0.8752.

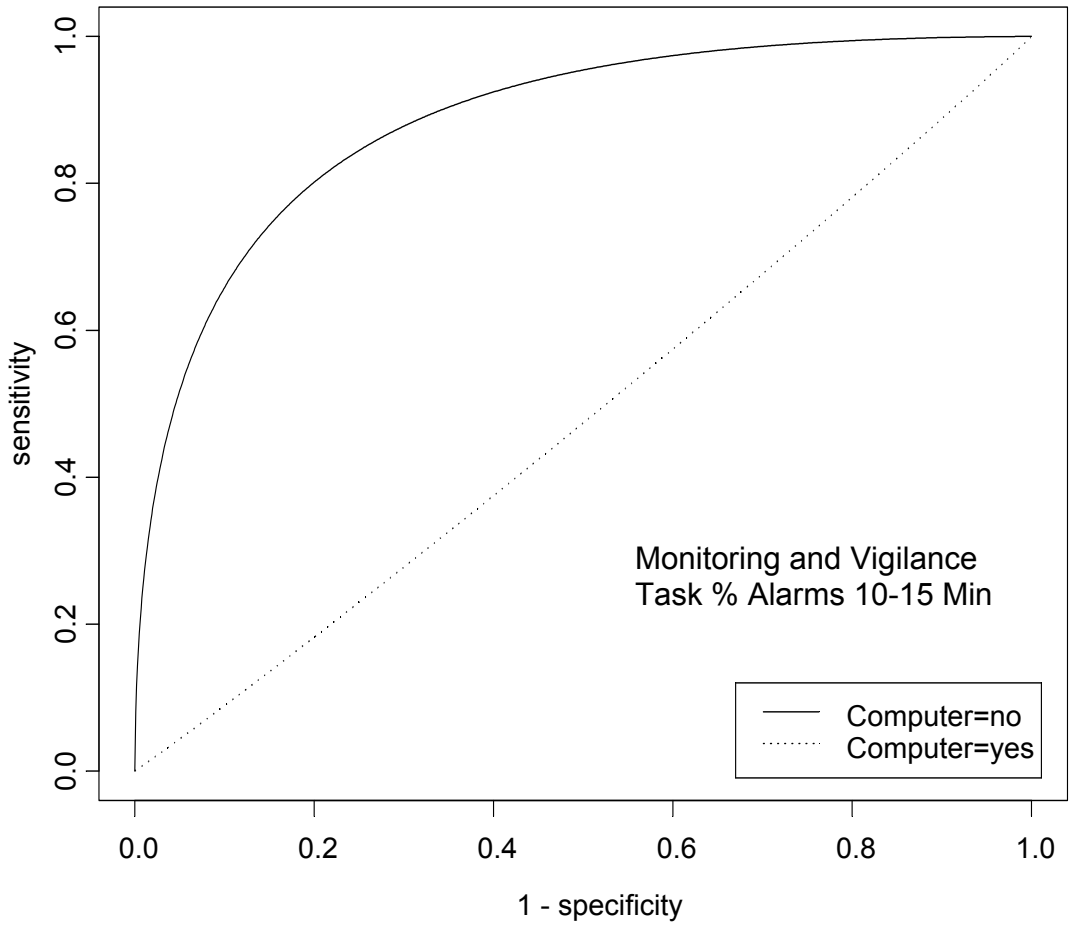

Fig. 30. Prediction of Neonatal Risk by Monitoring and Vigilance Task % Alarms, 10-15 minutes. Prediction was influenced by experience with computer manipulanda. The areas under the ROC curves are 0.8838, 0.4813.

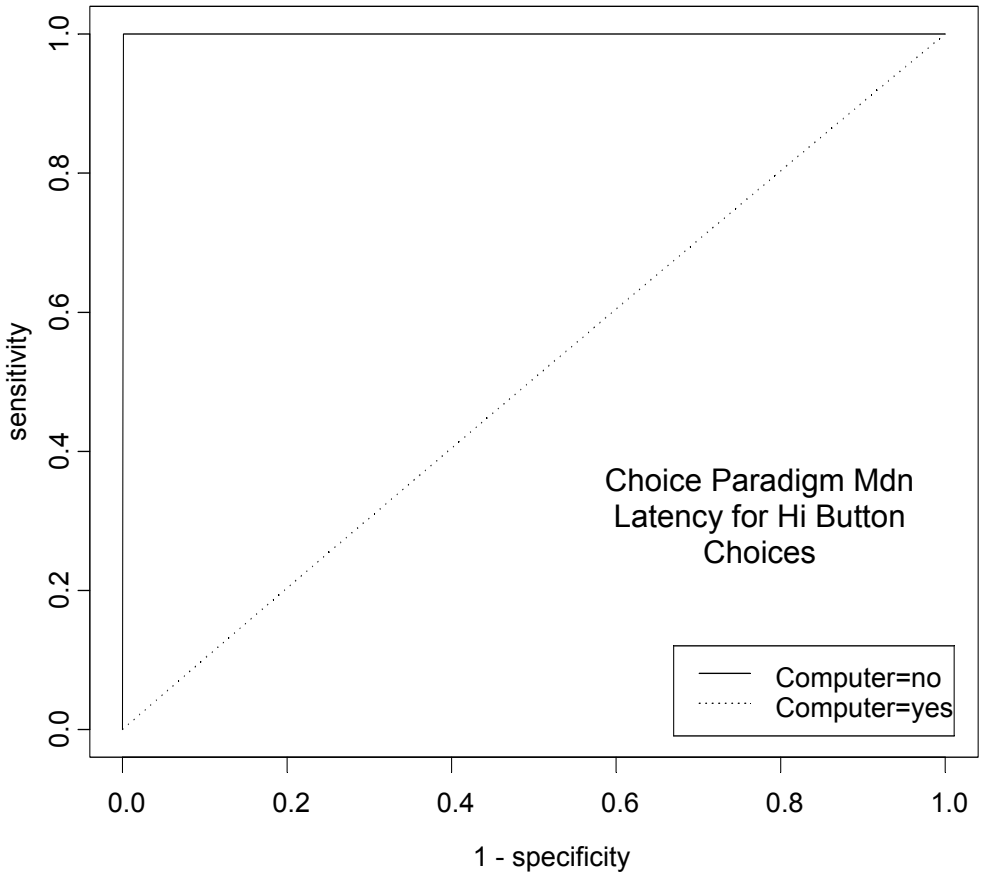

Fig. 31. Prediction of Neonatal Risk by Choice Paradigm FI Median Latency for Hi Button Choices. Prediction was influenced by experience with computer manipulanda. The areas under the ROC curves are 1.0000, 0.5033.

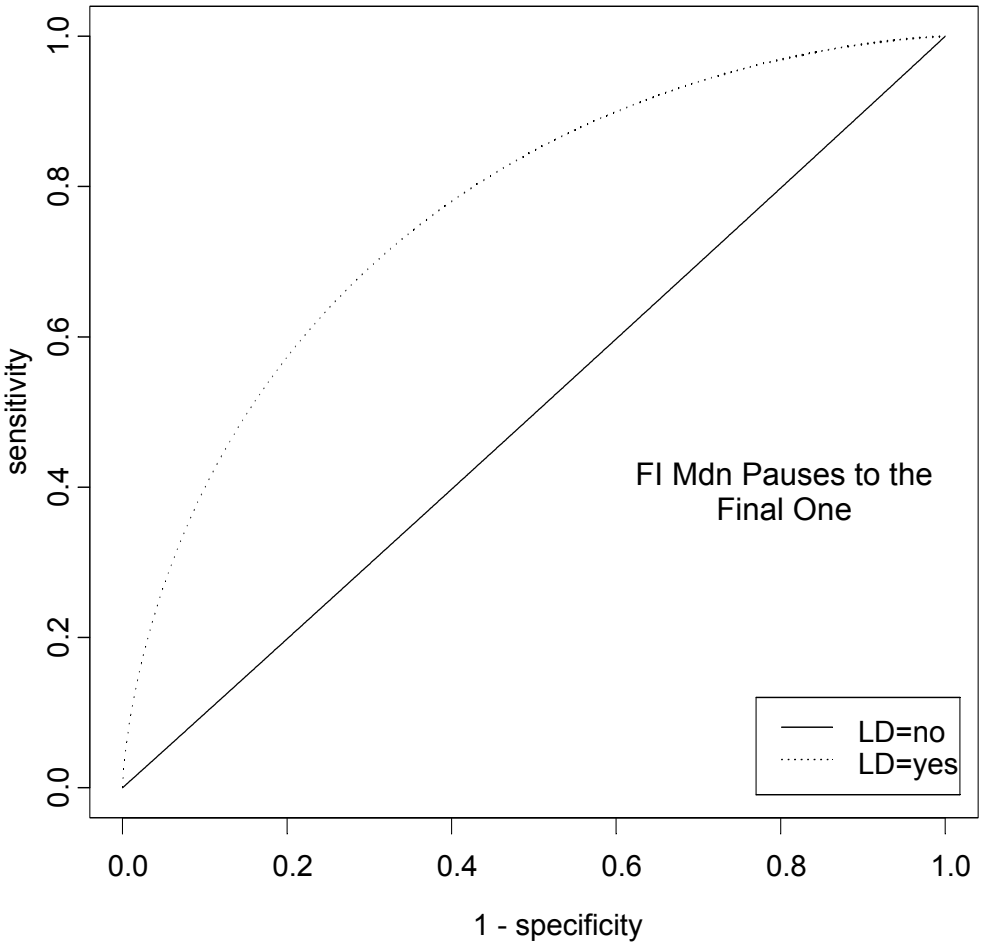

Fig. 32. Prediction of Neonatal Risk by FI Median Pauses to the Final One. Prediction was influenced by LD status. The areas under these ROC curves are 1.0000, 0.5033 (top); 0.4980, 0.7658 (middle); 0.9196, 0.1357, 0.9951, 0.5308 (bottom).

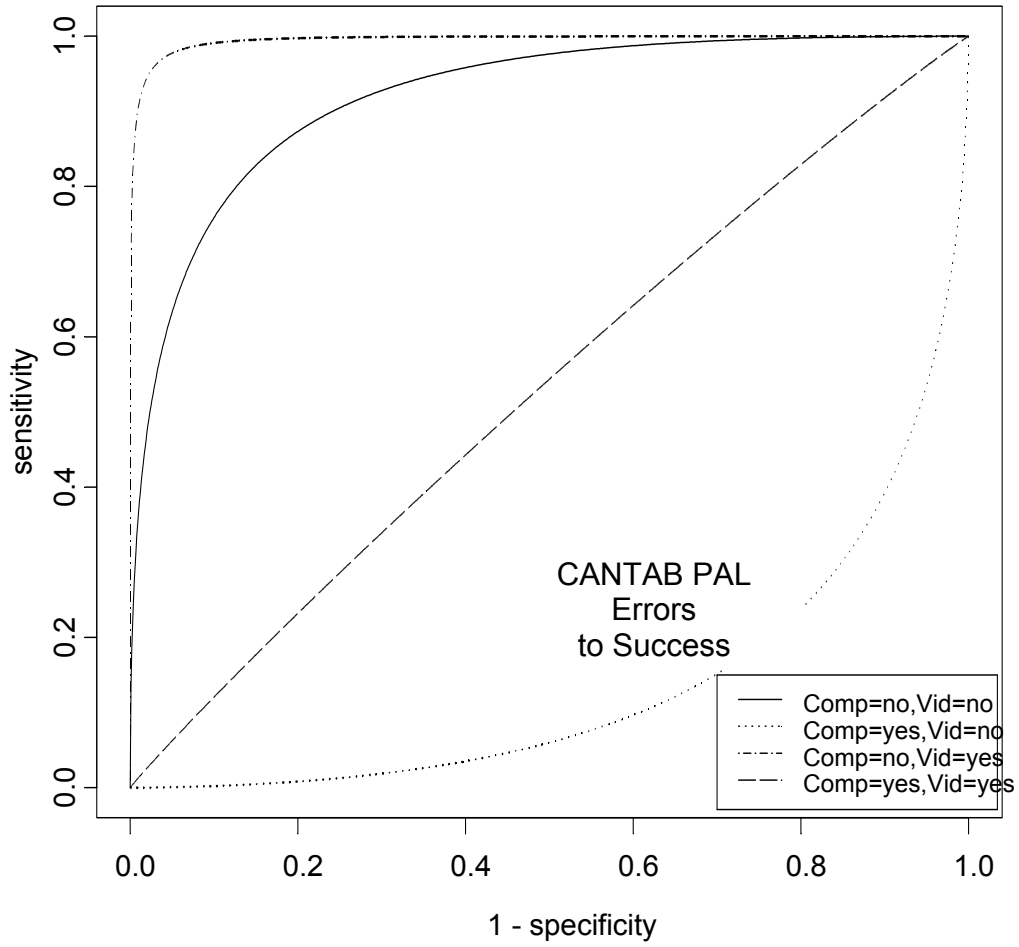

Fig. 33. Predition of Neonatal Risk by CANTAB Paired Associates Learning (PAL) Mean Errors to Success. Prediction was influenced by experience with computer manipulanda (Comp) and experience playing video games (Vid) The areas under the ROC curves are 0.9196, 0.1357, 0.9951, 0.5308.

Table 16
Intercorrelations: Auditory Processing Tasks

Pitch Pattern Sequence Test	Correct Only	Correct + Reversed	Gestures – Verbal Correct + Reversed
Correct Only	---	0.87	-0.57
Correct + Reversed	0.87	---	-0.49
Gestures-Verbal Correct + Reversed	-0.57	-0.49	---

Table 17
Intercorrelations: Perceptual Motor and Sensory Tasks

Task	Monitoring and Vigilance		Fine Motor Control	
	% Alarms	% Hazards	Reaction Time	Power (mrads/sec)
Monitoring and Vigilance				
% Alarms 10-15 min	---	0.79	0.11*	0.28
% Hazards 10-15 min	0.79	---	0.16	0.32
Fine Motor Control				
Reaction Time	0.11*	0.16	---	0.43
Power (mrads/sec)	0.28	0.32	0.43	---

* $p > 0.05$ (non-significant)

Table 18
Intercorrelations: Auditory and Visual Electrophysiological Endpoints

Task	DP OAE		Cognitive VEPs (P-300)	
	4000 Hz	6000Hz	Amplitude Cz	CPT RT
DP OAE @ 70dB				
4000 Hz	---	0.70	0.07*	-0.12
6000 Hz	0.70	---	0.07*	-0.12
Cognitive VEPs				
Amplitude Cz	0.07*	0.07*	---	0.18
CPT Reaction Time for Correct Responses	-0.12	-0.12	0.18	---

* $p > 0.05$ (non-significant)

Table 19
Intercorrelations: Final CANTAB, FI and Choice Endpoints

Task	Intra- and Extra-Dimensional Shift			Delayed Matching Long Delay	Fixed Interval		Paired Associate Learning		Self-Control	
	Trials	Errors	Stages Completed		Pause Duration	Inter-response Time	Errors	Trials	High Button Choices	High-Button Choice Latency
Intra- and Extra-Dimensional Shift										
Trials	---	0.94	0.99	0.27	0.09*	0.06*	0.19	0.18	0.04*	0.03*
Errors	0.94	---	0.96	0.22	-0.12*	-0.06*	-0.13	-0.11	-0.01*	-0.03*
Stages	0.99	0.96	---	-0.25	-0.11*	-0.06*	0.18	0.16	-0.02*	0.03*
Delayed Match-to-Sample Long Delay	-0.27	0.22	-0.25	---	0.12*	-0.01*	-0.31	-0.31	0.03*	-0.21
Fixed Interval										
Pause Duration	0.10*	-0.12*	0.11*	0.12	---	0.85	-0.06*	-0.06*	0.006*	0.02*
IRT	0.06*	-0.06*	0.07*	-0.01*	0.85	---	0.04*	0.04*	0.03*	0.01*
Paired Associate Learning										
Errors	0.19	-0.13	0.18	-0.31	-0.06*	-0.03*	---	0.95	-0.31	0.28
Trials	0.18	-0.11	0.16	-0.31	-0.06*	-0.04*	0.95	---	-0.34	0.22
Self-Control										
High Button Choices	-0.04*	-0.03*	-0.01*	0.04*	0.006*	0.03*	-0.31	-0.34	---	0.31
High Button Latency	-0.04*	-0.04*	-0.03*	-0.20	0.02*	0.01	0.28	0.22	0.31	---

* $p > 0.05$ (non-significant)