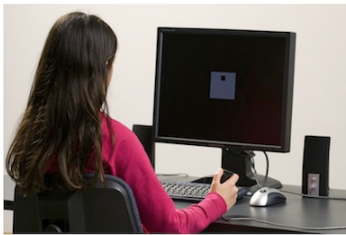


The Test Of Variables of Attention (T.O.V.A.®)

The **Test of Variables of Attention (T.O.V.A.)** is an FDA-cleared, state-of-the-art continuous performance test that provides healthcare professionals with objective measurements of attention and inhibitory control. The T.O.V.A. aids in the assessment of, and evaluation of treatment for, attention deficits, including attention-deficit/hyperactivity disorder (ADHD). T.O.V.A. results are available for children and adults (ages 4 - 80+) and should only be interpreted by qualified professionals.



The T.O.V.A. continuously measures performance during a 10.8-minute task or a 21.6-minute task, depending on age. It records speed, accuracy, and consistency of responses to a series of squares (in the visual T.O.V.A. test) or tones (in the auditory T.O.V.A. test) that are presented in two-second intervals. These measurements (accurate to ± 1 ms) are then compared by age and gender to a normative sample (a sample of people without attention problems). This comparison determines whether the test results are "within normal limits" or not. The T.O.V.A. also compares results to a group of people independently diagnosed with ADHD. The T.O.V.A. report is based on these two comparisons, as well as performance, session, and response validity measures.



If you have questions about this report, please contact the person who provided it to you. For more information about attention and the T.O.V.A., please visit our website at <https://www.tovatest.com/>. To contact us please email info@tovatest.com or call 800.PAY.ATTN (562.594.7700).

ID: 1 **Example Subject** (Apr 1, 2006)
Male - 11y 3m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
Jul 1, 2017 at 11:06 AM

Session comments

No medication to establish baseline.

Session, Response, and Performance Validity

Response Validity

These results must be interpreted with caution because of the unusually high number of anticipatory responses (> 10%) in Q3, Q4. Large numbers of anticipatory responses will decrease the number of commission and omission errors, thereby increasing commission and omission standard scores. Anticipatory responses are defined as responses that occur 200 ms before, and 150 ms after, the onset of a stimulus. Anticipatory errors can be the result of several things, including impulsivity, preferring response speed over accuracy, guessing, or noncompliance. Important exception: extremely slow response times (greater than 1,800 ms) to a stimulus will appear as anticipatory responses to the next stimulus.

Performance Validity

Performance Validity is applicable only to ages 17 or above.

Notes on the Comparison to the Normative Sample

Variability is a precise measure of variations in correct response times, and measures the consistency of response times. **Variability was borderline in Quarter 1, and not within normal limits in Quarters 2 and 4, Half 1 and 2, and Total.**

Response Time is the average speed of correct responses to targets, and is a measure of information processing speed. **Response Time was not within normal limits in Quarter 4.**

Commission Errors occur when the subject incorrectly responds to a nontarget, and are a measure of inhibitory control. **Commission Errors were borderline in the Total, and not within normal limits in Quarters 1 and 2, and Half 1.**

Omission Errors occur when the subject does not respond to a target, and are a measure of sustained attention. **Omission Errors were borderline in the Total, and not within normal limits in Quarter 4 and Half 2.**

Response Patterns

Only Quarter 3 is within normal limits. This may represent poor adaptation under conditions of low arousal and a positive but brief (5 minutes) response to increased stimulation.

Other Notes

Consider administering an Auditory T.O.V.A. to this subject for a more comprehensive assessment of attention. This is important because an individual can have markedly different results on one test versus the other.

ID: **1 Example Subject** (Apr 1, 2006)
Male - 11y 3m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
 Jul 1, 2017 at 11:06 AM

Treatment

No treatments entered.

Attention Comparison Score

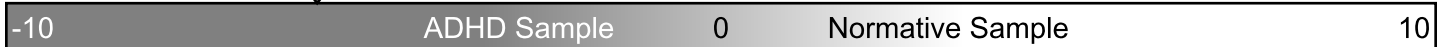
The Attention Comparison Score (ACS) is a subset of T.O.V.A. variables used to compare the subject's performance to a sample of individuals independently diagnosed with ADHD. Scores below 0 suggest a performance more similar to that of individuals with ADHD.

Note that the ACS does not include important variables from the Comparison to the Normative Sample. In order to understand the overall test results, the ACS should always be used with the Comparison to the Normative Sample, found on the Summary page. In particular, when the ACS is above zero and the Comparison to the Normative Sample is not within normal limits, the results should be considered not within normal limits.

The ACS is calculated by summing the following Z scores:

Response Time (Half 1)	-0.79
D Prime (Half 2)	-1.57
Variability (Total)	-5.05
Calibration constant	1.80
Attention Comparison Score	-5.61

-5.61

ID: **1 Example Subject** (Apr 1, 2006)
Male - 11y 3m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
 Jul 1, 2017 at 11:06 AM

This page contains tabulated raw data and documents T.O.V.A. session parameters.

		Quarter				Half		Total
		1	2	3	4	1	2	
RT Variability	ms	147	161	121	472	155	335	294
Response Time	ms	475	501	326	532	488	412	435
Post-commission responses	#	1	3	9	8	4	17	21
Response Time	ms	493	524	289	418	516	350	381
Variability	ms	0	136	117	398	119	293	277
Commission Errors	#	10/126	9/126	12/36	18/36	19/252	30/72	49/324
Percentage	%	7.9	7.1	33.3	50	7.5	41.7	15.1
Response Time	ms	256	272	354	267	264	302	287
Omission Errors	#	1/36	2/36	4/126	27/126	3/72	31/252	34/324
Percentage	%	2.8	5.6	3.2	21.4	4.2	12.3	10.5
D Prime		3.32	3.06	2.29	0.79	3.17	1.37	2.29
Standard Score		72	76	81	73	77	76	76
Beta		0.43	0.82	0.2	0.73	0.63	0.52	0.78
Anticipatory	%	1.2	0	21	26.5	0.6	23.8	12.2
To Nontargets	#	2	0	4	10	2	14	16
To Targets	#	0	0	30	33	0	63	63
Multiple Responses	#	0	0	0	0	0	0	0
Total Correct	#	149/162	151/162	112/162	74/162	300/324	186/324	486/648
Percentage	%	92	93.2	69.1	45.7	92.6	57.4	75
Skew	ms	-24	43	107	245	-8	169	179
User Interrupts	#	0	0	0	0	0	0	0
Hardware errors	#	0	0	0	0	0	0	0

Infrequent

Frequent

Session parameters

Format: 1 (standard)
 ISI: 2000 ms
 Stimulus On Time: 200 ms
 Stimulus Off Time: 300 ms
 Anticipatory Cutoff: 150 ms

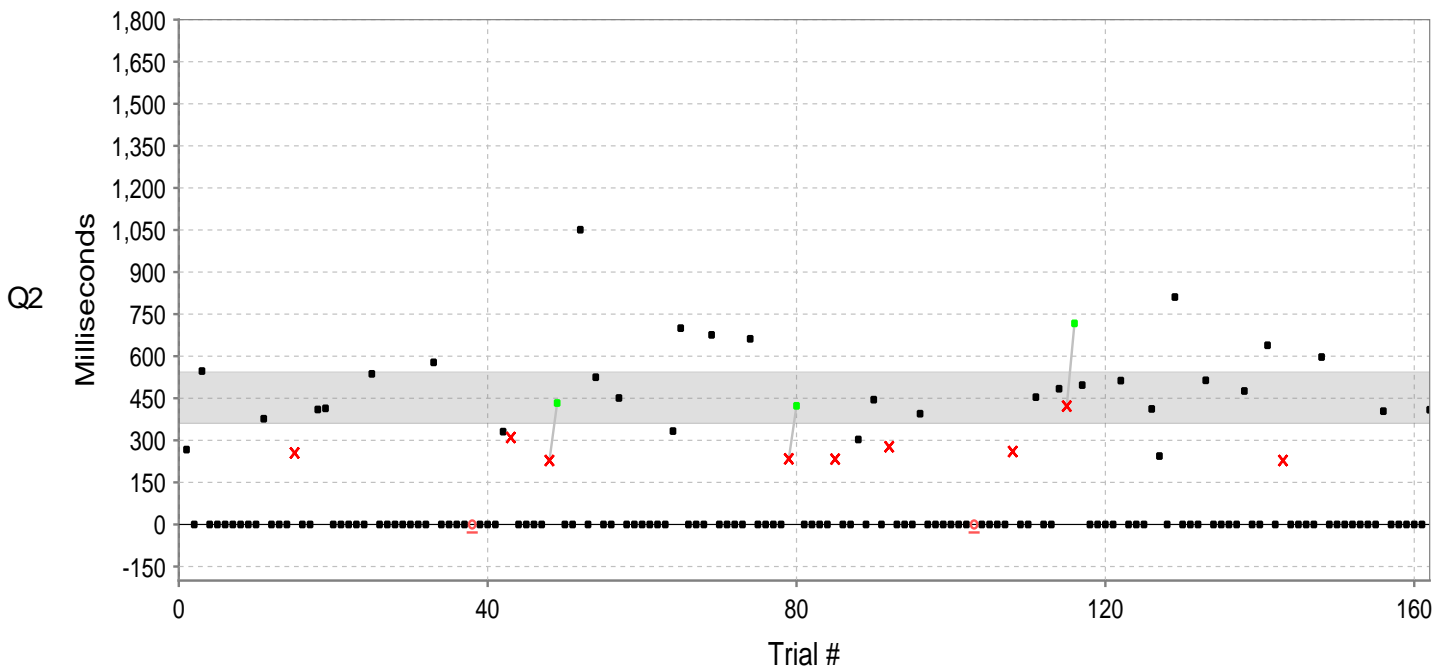
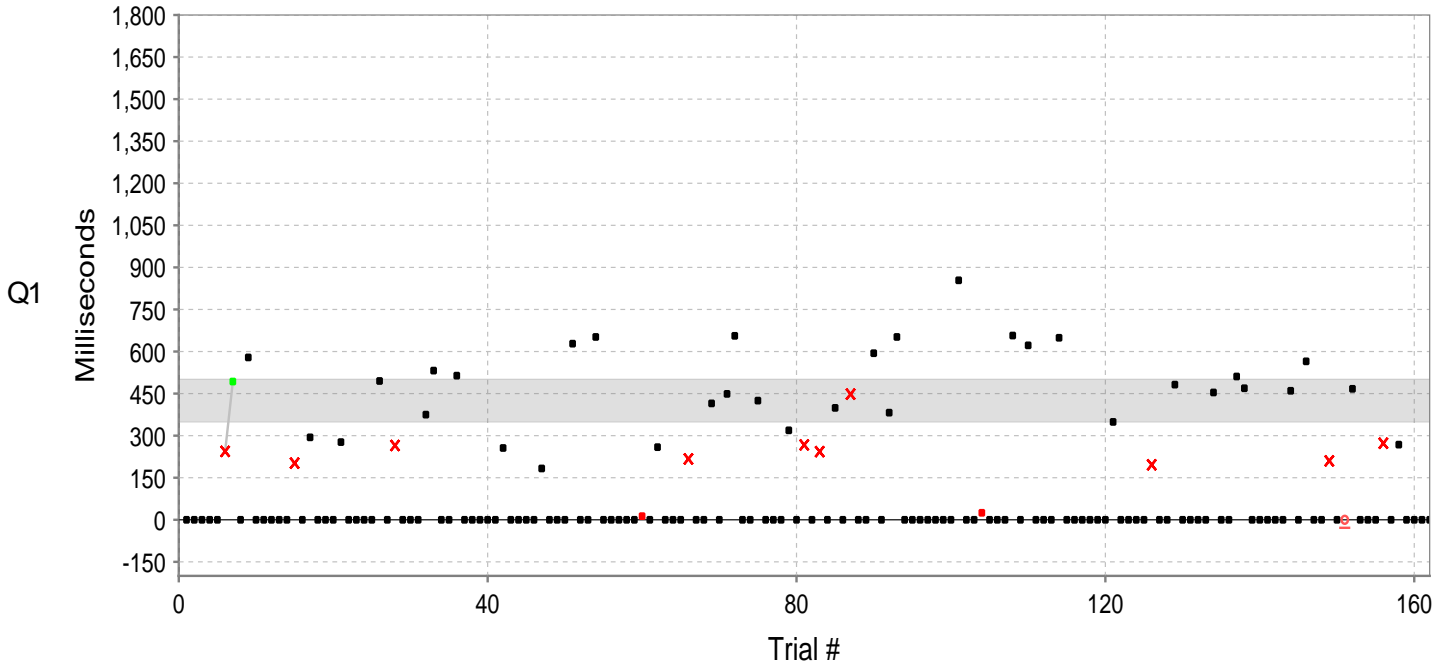
Session information

Tester:
 Import Filename: example-treatment-male-11.tova (2 / 3)
 Import Date: Aug 23, 2022 11:43:46 AM
 Errors/Warnings: Microswitch message flooding (27)

ID: 1 **Example Subject** (Apr 1, 2006)
Male - 11y 3m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
 Jul 1, 2017 at 11:06 AM

This page graphically displays the subject's responses. Black squares mark correct responses and correct nonresponses. Red 'X's mark commission errors, red squares mark anticipatory responses, and underlined red circles mark omission errors. The light gray region represents the normative range of responses. Commission errors followed by a correct response are linked by a line: an upward slope (light gray) indicates slowing down following an error (typical), and a downward slope (black) indicates speeding up after making an error (unusual). Red numbers above the zero line indicate the number of missed targets (if three or more in a row), and the red number below the zero line indicates the number of seconds elapsed between correct target responses.

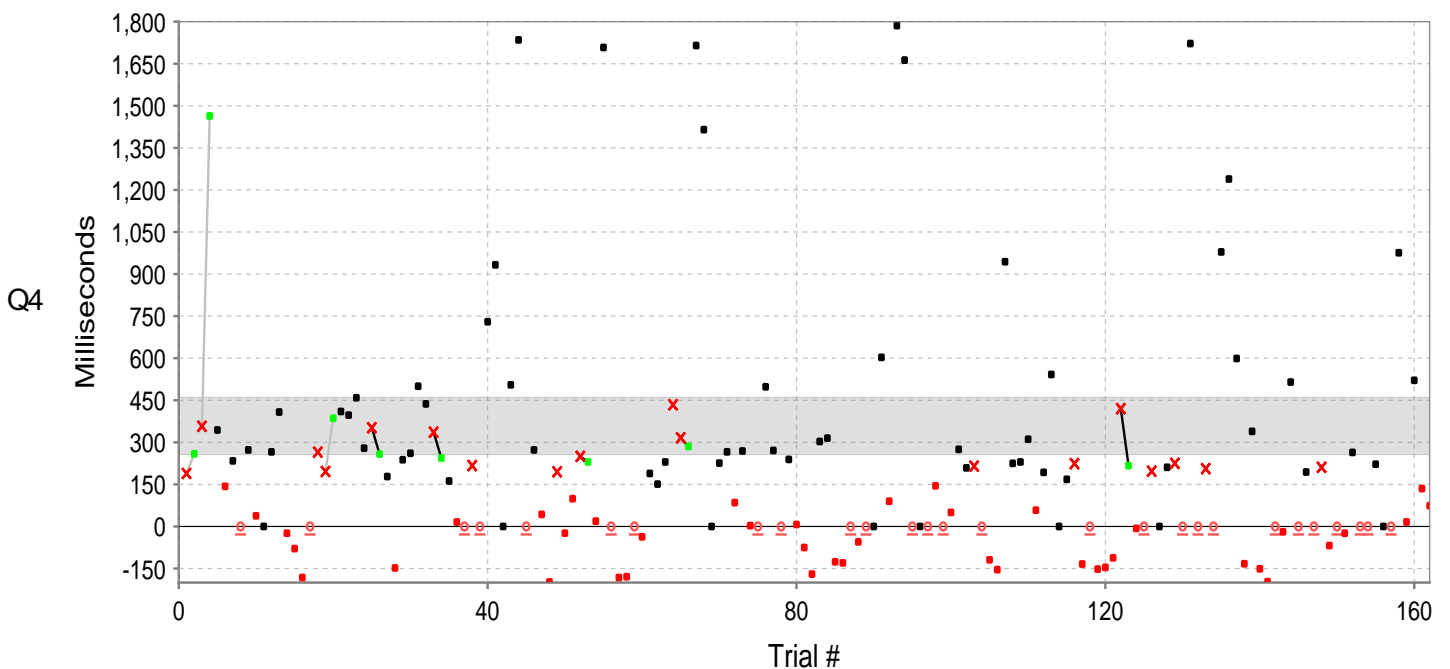
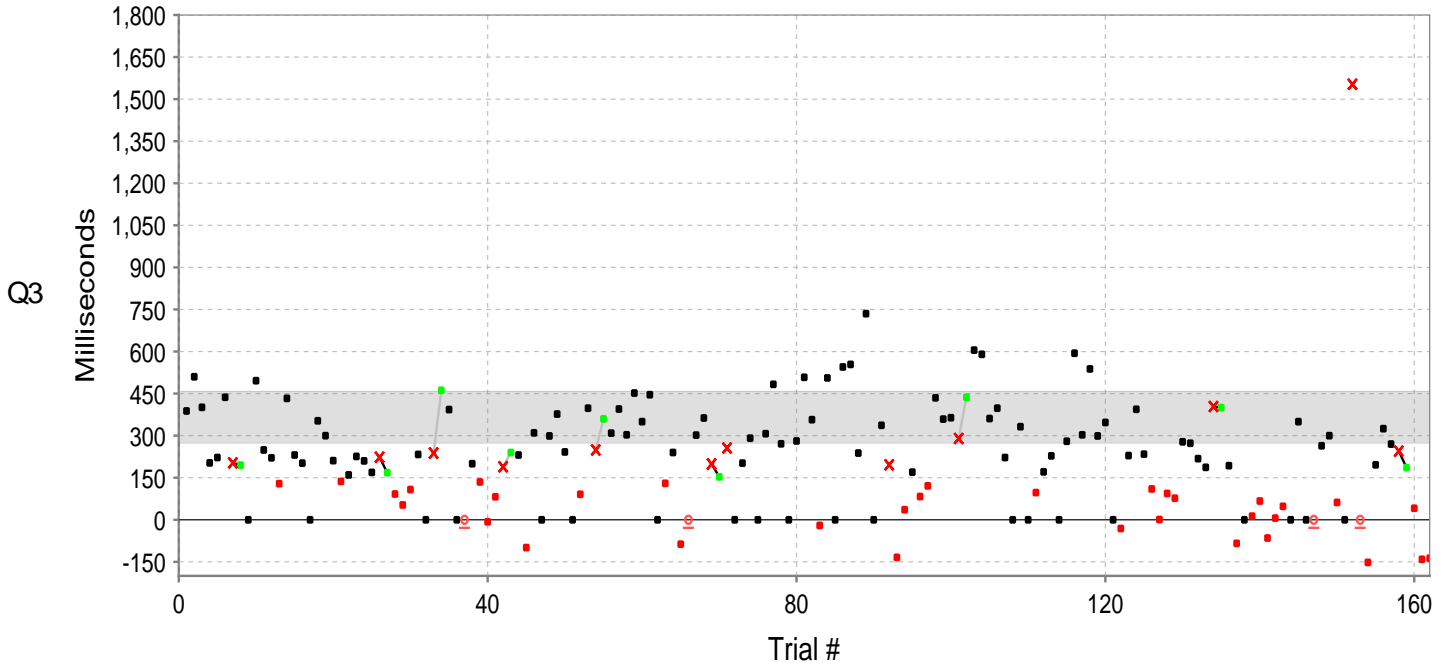


- Correct response ■ Correct non-response × Commission error ○ Omission error ■ Anticipatory response
- Post-commission error correct response / Slower post-commission RT \ Faster post-commission RT
- ▲△ Off-scale resp./error ■ Normative range | Interruption 3 10s Response gap (# Targets and Sec)

ID: 1 **Example Subject** (Apr 1, 2006)
Male - 11y 3m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
 Jul 1, 2017 at 11:06 AM

This page graphically displays the subject's responses. Black squares mark correct responses and correct nonresponses. Red 'X's mark commission errors, red squares mark anticipatory responses, and underlined red circles mark omission errors. The light gray region represents the normative range of responses. Commission errors followed by a correct response are linked by a line: an upward slope (light gray) indicates slowing down following an error (typical), and a downward slope (black) indicates speeding up after making an error (unusual). Red numbers above the zero line indicate the number of missed targets (if three or more in a row), and the red number below the zero line indicates the number of seconds elapsed between correct target responses.



- Correct response ■ Correct non-response × Commission error ○ Omission error ■ Anticipatory response
- Post-commission error correct response / Slower post-commission RT \ Faster post-commission RT
- ▲△ Off-scale resp./error ■ Normative range | Interruption 3 10s Response gap (# Targets and Sec)

ID: **1** **Example Subject** (Apr 1, 2006)
Male - 11y 3m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
 Jul 1, 2017 at 11:06 AM

This page shows a trial-by-trial view of T.O.V.A. test data. Each entry in the table indicates the stimulus type (target or nontarget) and the subject's response to that stimulus. Error responses are shown in red, and response times are in milliseconds. A negative response time indicates a response that was made before the stimulus was presented.

1-27	28-54	55-81	82-108	109-135	136-162
N	C 265	N	N	N	N
N	N	N	C 243	T 622	T 511
N	N	N	N	N	T 469
N	N	N	T 399	N	N
N	T 375	N	N	N	N
C 244	T 532	NA 13	C 448	T 649	N
T 493	N	N	N	N	N
N	N	T 259	N	N	N
T 579	T 514	N	T 594	N	T 460
N	N	N	N	N	N
N	N	N	T 382	N	T 565
N	N	C 217	T 652	N	N
N	N	N	N	T 349	N
N	N	N	N	N	C 210
C 202	T 256	T 415	N	N	O
N	N	N	N	N	N
T 294	N	T 449	N	N	T 467
N	N	T 656	N	C 196	N
N	N	N	N	N	N
N	T 183	N	T 854	N	N
T 277	N	T 425	N	T 482	C 273
N	N	N	N	N	N
N	N	N	NA 25	N	T 268
N	T 628	N	N	N	N
N	N	T 319	N	N	N
T 495	N	N	N	T 454	N
N	T 652	C 267	T 657	N	N

163-189	190-216	217-243	244-270	271-297	298-324
T 267	N	N	N	N	N
N	N	N	N	N	N
T 547	N	T 451	N	T 454	T 476
N	N	N	C 233	N	N
N	N	N	N	N	N
N	T 578	N	N	T 484	T 639
N	N	N	T 303	C 422	N
N	N	N	N	T 717	C 228
N	N	N	T 445	T 497	N
N	N	T 333	N	N	N
T 377	O	T 700	C 277	N	N
N	N	N	N	N	N
N	N	N	N	N	T 597
N	N	N	N	T 513	N
C 255	T 331	T 676	T 395	N	N
N	C 310	N	N	N	N
N	N	N	N	N	N
T 410	N	N	N	T 412	N
T 414	N	N	N	T 244	N
N	N	T 662	N	N	N
N	C 228	N	N	T 811	T 404
N	T 433	N	O	N	N
N	N	N	N	N	N
N	N	N	N	N	N
T 537	T 1051	C 234	N	T 514	N
N	N	T 423	N	N	N
N	T 525	N	C 260	N	T 409

325-351	352-378	379-405	406-432	433-459	460-486
T 388	TA 92	T 360	T 357	T 332	T 193
T 510	TA 53	T 309	TA -20	N	NA -84
T 401	TA 108	T 395	T 506	TA 97	N
T 203	T 233	T 303	N	T 171	TA 13
T 222	N	T 452	T 545	T 228	TA 67
T 437	C 238	T 350	T 554	N	TA -65
C 203	T 462	T 446	T 238	T 280	TA 6
T 195	T 393	N	T 735	T 594	TA 48
N	N	TA 130	N	T 303	N
T 496	O	T 240	T 337	T 538	T 350
T 249	T 200	TA -87	C 196	T 299	N
T 221	TA 135	O	NA -134	T 347	O
TA 129	TA -7	T 302	TA 36	N	T 264
T 433	TA 82	T 363	T 170	TA -31	T 300
T 231	C 189	C 199	TA 83	T 229	TA 62
T 202	T 240	T 153	TA 121	T 394	N
N	T 231	C 256	T 435	T 234	C 1553
T 353	TA -99	N	T 359	TA 110	O
T 300	T 310	T 202	T 364	TA 1	TA -152
T 211	N	T 291	C 290	TA 94	T 196
NA 137	T 299	N	T 437	NA 77	T 325
T 160	T 377	T 307	T 605	T 278	T 270
T 226	T 242	T 483	T 590	T 273	C 245
T 210	N	T 271	T 361	T 218	T 186
T 169	TA 91	N	T 398	T 187	TA 41
C 223	T 398	T 281	T 222	C 404	TA -141
T 168	C 249	T 508	N	T 400	TA -137

487-513	514-540	541-567	568-594	595-621	622-648
C 189	TA -148	T 1708	TA -170	T 230	T 1239
T 259	T 238	O	T 303	T 311	T 599
C 357	T 261	NA -182	T 315	NA 58	NA -133
T 1464	T 500	TA -179	TA -126	T 193	T 339
T 344	T 437	O	TA -130	T 542	TA -151
TA 143	C 336	TA -37	O	N	NA -197
T 234	T 244	T 189	NA -55	T 168	O
O	T 162	T 151	O	C 224	TA -19
T 273	TA 16	T 230	N	NA -134	T 515
TA 38	O	C 434	T 603	O	O
N	C 217	C 316	TA 90	TA -152	T 194
T 266	O	T 285	T 1786	TA -146	O
T 408	T 730	T 1715	T 1663	TA -112	C 211
TA -24	T 933	T 1415	O	C 420	TA -68
TA -79	N	N	N	T 217	O
TA -182	T 505	T 226	O	TA -7	TA -24
O	T 1735	T 266	TA 145	O	T 264
C 265	O	TA 85	O	C 197	O
C 196	T 273	T 269	TA 50	N	O
T 386	TA 43	NA 3	T 275	T 211	T 222
T 410	TA -198	O	T 209	C 225	N
T 397	C 195	T 498	C 215	O	O
T 459	TA -24	T 271	O	T 1722	T 976
T 279	TA 99	O	TA -119	O	TA 16
C 352	C 250	T 239	TA -154	C 206	T 521
T 258	T 230	NA 7	T 944	O	TA 135
T 178	NA 19	TA -75	T 225	T 979	NA 74

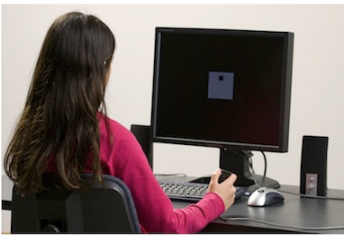
T = Correct response to target O = Omission error A = Anticipatory response
 N = Correct nonresponse to nontarget C = Commission error M = Multiple response
 Green = Post-Commission-error correct response U = User interrupt H = Hardware interrupt

The Test Of Variables of Attention (T.O.V.A.®)

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ID: 1 **Example Subject** (Apr 1, 2006)
Male - 11y 4m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
 Aug 1, 2017 at 10:10 AM

Session, Response, and Performance Validity

This session meets session, response and performance validity criteria.

T.O.V.A. Interpretation

The results of this T.O.V.A. are not within normal limits, and may be suggestive of a possible attention deficit, including ADHD, because the Comparison to the Normative Sample is not within normal limits. Please see the Interpretation Notes page for additional information.

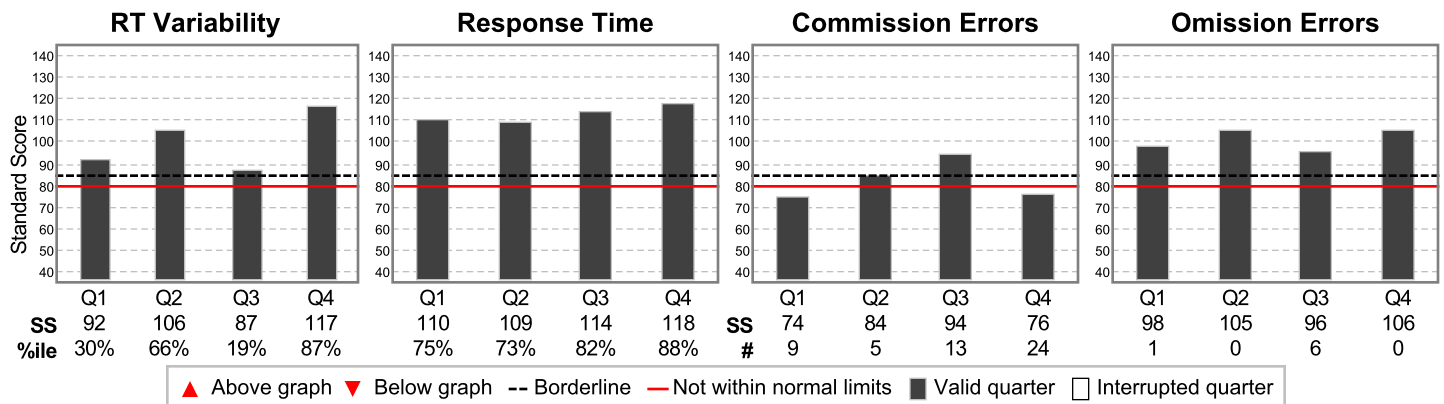
Treatment

50.0mg dose of Adderall taken 2.5 hours before testing.

Comparison to the Normative Sample

These scores compare this subject's performance to the performance of individuals of the same gender and age in the T.O.V.A. Normative Sample, a study of individuals who did not have attention problems.

Results are reported as standard scores (average standard = 100; standard deviation = 15). Standard scores above 85 are considered to be in the normal range, scores between 80 and 85 are considered borderline, and scores below 80 are considered not within normal limits. Scores less than 70 are considered significantly below normal range. Standard scores less than 40 are more than 4 standard deviations from normal, and are denoted as "<40".



Quarters, Halves and the Total are independently calculated and are not averages. Any Quarter, Half or Total that is Borderline or Not Within Normal Limits causes the Interpretation to be Borderline or Not Within Normal Limits. See the Interpretation Notes page for more information on these variables and on the subject's performance.

	Quarter				Half		Total
	1	2	3	4	1	2	
RT Variability	92	106	87	117	100	102	101
Response Time	110	109	114	118	110	117	116
Commission Errors	74	84	94	76	77	85	80
Omission Errors	98	105	96	106	101	99	100

Infrequent Frequent

Key: Borderline, Not within normal limits, Invalid

ID: 1 **Example Subject** (Apr 1, 2006)
Male - 11y 4m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
Aug 1, 2017 at 10:10 AM

Session comments

Test to compare baseline to 50 mg Adderall.

Session, Response, and Performance Validity

Performance Validity

Performance Validity is applicable only to ages 17 or above.

Notes on the Comparison to the Normative Sample

Variability is a precise measure of variations in correct response times, and measures the consistency of response times. **Variability was within normal limits.**

Response Time is the average speed of correct responses to targets, and is a measure of information processing speed. **Response Time was within normal limits.**

Commission Errors occur when the subject incorrectly responds to a nontarget, and are a measure of inhibitory control. **Commission Errors were borderline in Quarter 2, Half 2, and Total, and not within normal limits in Quarters 1 and 4, and Half 1.**

Omission Errors occur when the subject does not respond to a target, and are a measure of sustained attention. **Omission Errors were within normal limits.**

Response Patterns

Only Quarter 3 is within normal limits. This may represent poor adaptation under conditions of low arousal and a positive but brief (5 minutes) response to increased stimulation.

In Q4, H2, T, the standard score for inhibitory control (commission errors) was low and the standard score for response time was high. Despite being instructed to balance speed and accuracy, the subject may have adopted a fast response strategy that emphasized responding as quickly as possible, resulting in high commission errors.

Other Notes

Consider administering an Auditory T.O.V.A. to this subject for a more comprehensive assessment of attention. This is important because an individual can have markedly different results on one test versus the other.

ID: **1 Example Subject** (Apr 1, 2006)
Male - 11y 4m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
 Aug 1, 2017 at 10:10 AM

Treatment

50.0mg dose of Adderall taken 2.5 hours before testing.

Attention Comparison Score

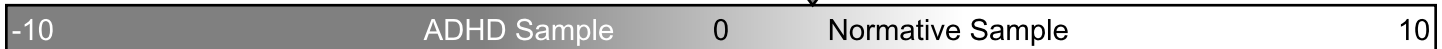
The Attention Comparison Score (ACS) is a subset of T.O.V.A. variables used to compare the subject's performance to a sample of individuals independently diagnosed with ADHD. Scores below 0 suggest a performance more similar to that of individuals with ADHD.

Note that the ACS does not include important variables from the Comparison to the Normative Sample. In order to understand the overall test results, the ACS should always be used with the Comparison to the Normative Sample, found on the Summary page. In particular, when the ACS is above zero and the Comparison to the Normative Sample is not within normal limits, the results should be considered not within normal limits.

The ACS is calculated by summing the following Z scores:

Response Time (Half 1)	0.64
D Prime (Half 2)	-1.21
Variability (Total)	0.04
Calibration constant	1.80
Attention Comparison Score	1.27

1.27

ID: **1 Example Subject** (Apr 1, 2006)
Male - 11y 4m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
 Aug 1, 2017 at 10:10 AM

This page contains tabulated raw data and documents T.O.V.A. session parameters.

		Quarter				Half		Total
		1	2	3	4	1	2	
RT Variability	ms	120	89	142	72	106	114	123
Response Time	ms	387	412	302	265	400	283	311
Post-commission responses	#	3	2	8	19	5	27	32
Response Time	ms	300	417	287	225	347	244	260
Variability	ms	59	59	96	37	82	67	79
Commission Errors	#	9/126	5/126	13/36	24/36	14/252	37/72	51/324
Percentage	%	7.1	4	36.1	66.7	5.6	51.4	15.7
Response Time	ms	244	318	242	232	271	235	245
Omission Errors	#	1/36	0/36	6/126	0/126	1/72	6/252	7/324
Percentage	%	2.8	0	4.8	0	1.4	2.4	2.2
D Prime		3.38	6.02	2.02	3.83	3.79	1.95	3.03
Standard Score		73	98	78	102	82	82	83
Beta		0.47	0	0.26	0	0.32	0.14	0.21
Anticipatory	%	0.6	0	5.6	6.2	0.3	5.9	3.1
To Nontargets	#	1	0	4	0	1	4	5
To Targets	#	0	0	5	10	0	15	15
Multiple Responses	#	0	0	0	0	0	0	0
Total Correct	#	151/162	157/162	134/162	128/162	308/324	262/324	570/648
Percentage	%	93.2	96.9	82.7	79	95.1	80.9	88
Skew	ms	105	33	76	24	-13	57	89
User Interrupts	#	0	0	0	0	0	0	0
Hardware errors	#	0	0	0	0	0	0	0

Infrequent

Frequent

Session parameters

Format: 1 (standard)
 ISI: 2000 ms
 Stimulus On Time: 200 ms
 Stimulus Off Time: 300 ms
 Anticipatory Cutoff: 150 ms

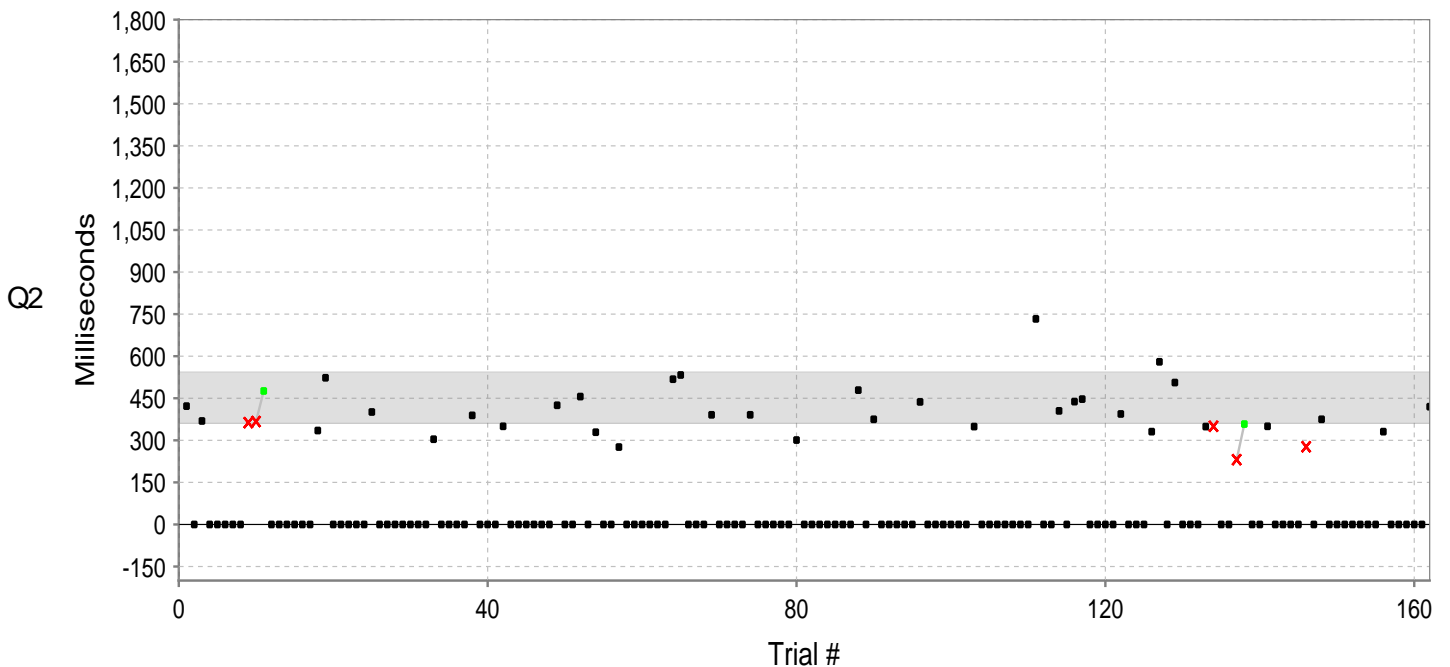
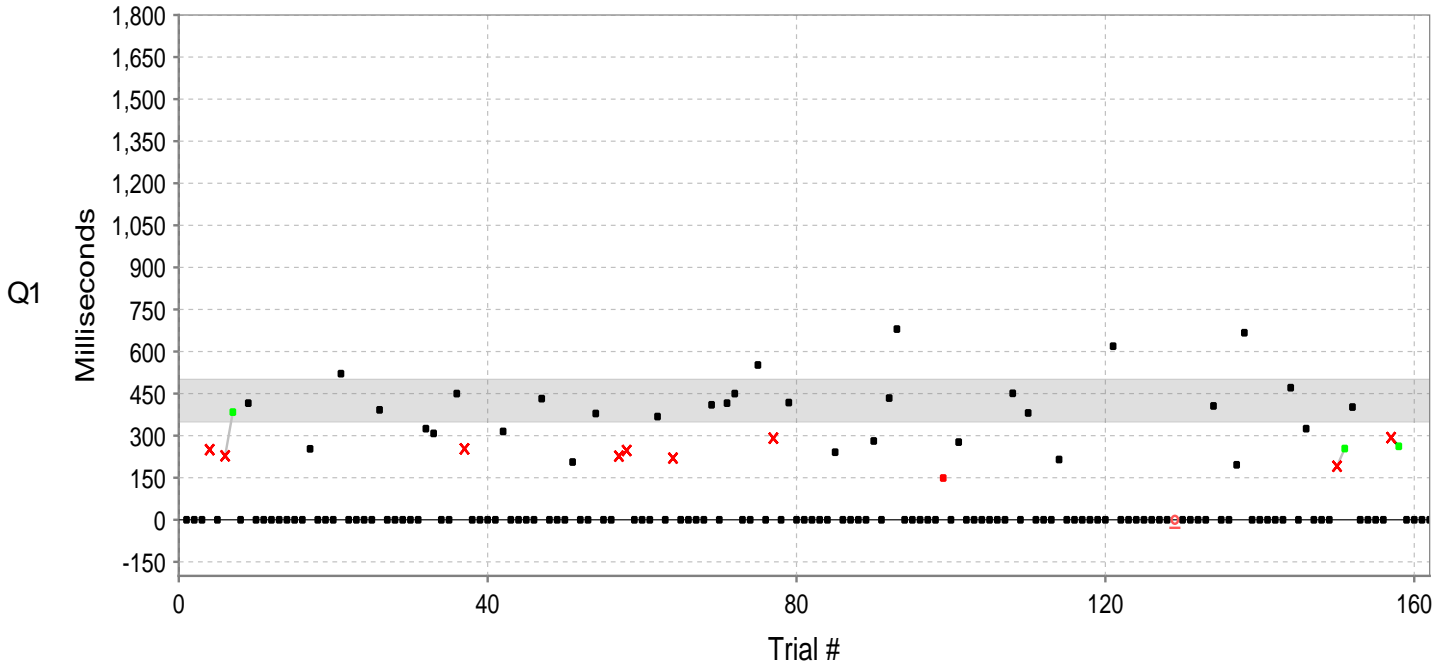
Session information

Tester:
 Import Filename: example-treatment-male-11.tova (1 / 3)
 Import Date: Aug 23, 2022 11:43:46 AM
 Errors/Warnings: Response 98: Commission reclassified as Anticipatory (possible rounding error)
 Microswitch message flooding (1)

ID: 1 **Example Subject** (Apr 1, 2006)
Male - 11y 4m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
 Aug 1, 2017 at 10:10 AM

This page graphically displays the subject's responses. Black squares mark correct responses and correct nonresponses. Red 'X's mark commission errors, red squares mark anticipatory responses, and underlined red circles mark omission errors. The light gray region represents the normative range of responses. Commission errors followed by a correct response are linked by a line: an upward slope (light gray) indicates slowing down following an error (typical), and a downward slope (black) indicates speeding up after making an error (unusual). Red numbers above the zero line indicate the number of missed targets (if three or more in a row), and the red number below the zero line indicates the number of seconds elapsed between correct target responses.

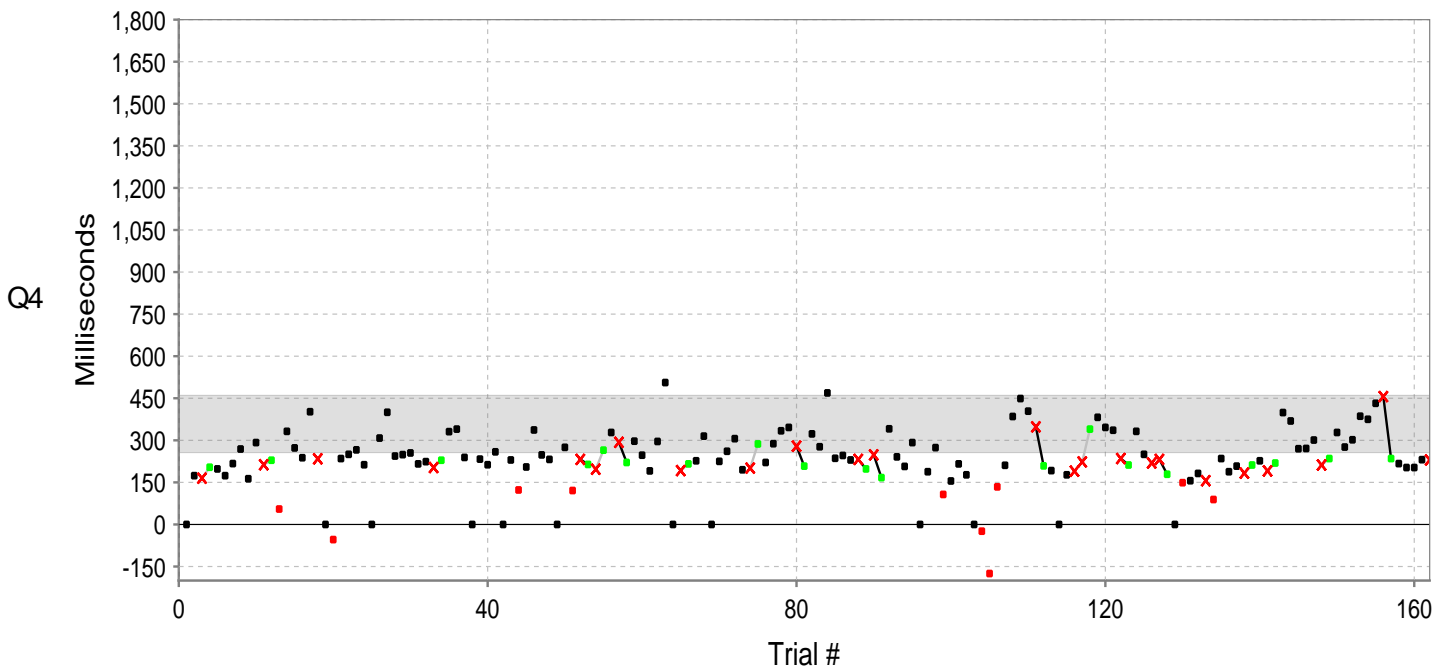
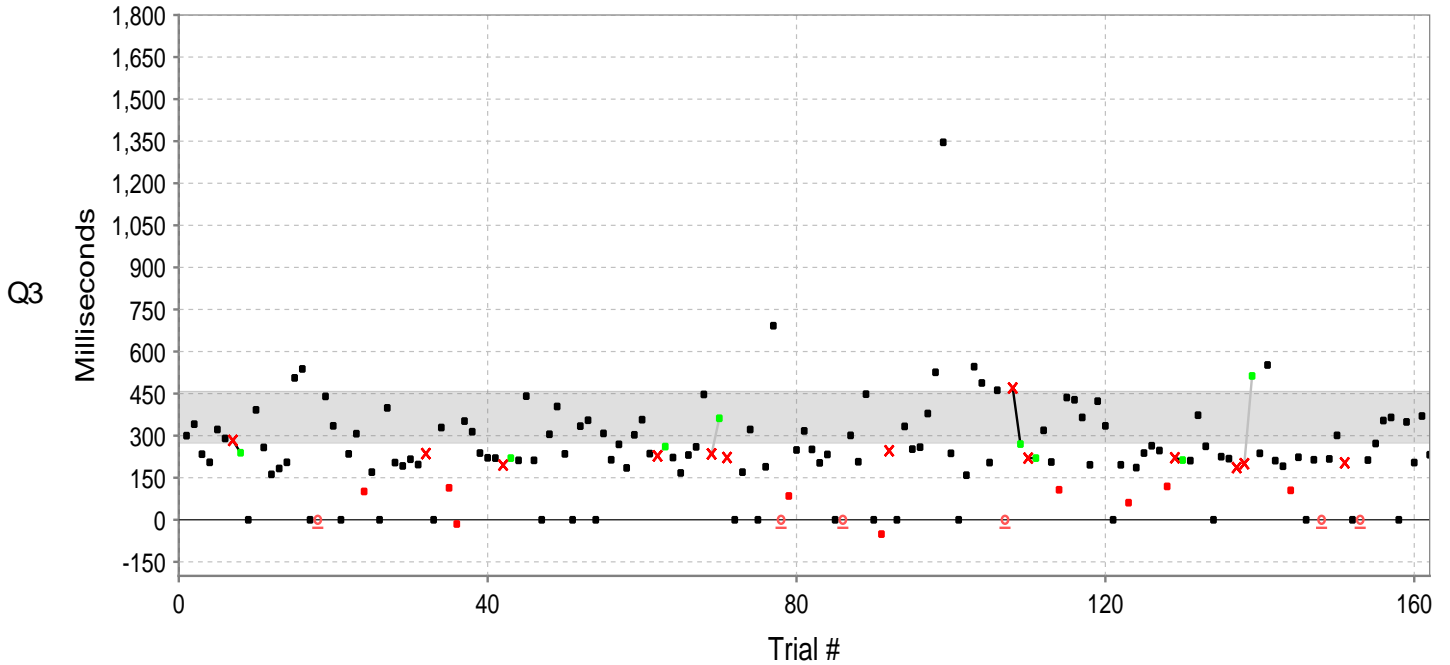


- Correct response ■ Correct non-response ✕ Commission error ○ Omission error ■ Anticipatory response
- Post-commission error correct response / Slower post-commission RT \ Faster post-commission RT
- ▲△ Off-scale resp./error ■ Normative range | Interruption 3 10s Response gap (# Targets and Sec)

ID: 1 **Example Subject** (Apr 1, 2006)
Male - 11y 4m 0d

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Male - 11y 4m 0d

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This page shows a trial-by-trial view of T.O.V.A. test data. Each entry in the table indicates the stimulus type (target or nontarget) and the subject's response to that stimulus. Error responses are shown in red, and response times are in milliseconds. A negative response time indicates a response that was made before the stimulus was presented.

1-27	28-54	55-81	82-108	109-135	136-162
N	N	N	N	N	N
N	N	N	N	T 381	T 196
N	N	C 227	N	N	T 667
C 250	N	C 247	T 241	N	N
N	T 325	N	N	N	N
C 228	T 308	N	N	T 215	N
T 384	N	N	N	N	N
N	N	T 368	N	N	N
T 416	T 450	N	T 281	N	T 471
N	C 253	C 220	N	N	N
N	N	N	T 434	N	T 325
N	N	N	T 680	N	N
N	N	N	N	T 619	N
N	N	N	N	N	N
N	T 315	T 410	N	N	C 191
N	N	N	N	N	T 254
T 253	N	T 416	N	N	T 402
N	N	T 450	NA 149	N	N
N	N	N	N	N	N
N	N	N	T 277	N	N
T 521	N	T 552	N	O	N
N	N	N	N	N	C 293
N	N	C 291	N	N	T 262
N	T 206	N	N	N	N
N	N	T 418	N	N	N
T 392	N	N	N	T 406	N
N	T 379	N	T 451	N	N

163-189	190-216	217-243	244-270	271-297	298-324
T 422	N	N	N	N	N
N	N	N	N	N	C 231
T 369	N	T 276	N	T 733	T 358
N	N	N	N	N	N
N	N	N	N	N	N
N	T 304	N	N	T 405	T 350
N	N	N	T 479	N	N
N	N	N	N	T 438	N
C 363	N	T 375	T 375	T 447	N
C 367	N	T 518	N	N	N
T 476	T 389	T 533	N	N	C 277
N	N	N	N	N	N
N	N	N	N	N	T 375
N	N	N	N	T 394	N
N	T 350	T 391	T 437	N	N
N	N	N	N	N	N
N	N	N	N	N	N
T 335	N	N	N	T 331	N
T 523	N	N	N	T 580	N
N	N	T 391	N	N	N
N	N	N	N	T 506	T 331
N	T 425	N	T 349	N	N
N	N	N	N	N	N
N	N	N	N	N	N
T 401	T 456	N	N	T 349	N
N	N	T 301	N	C 350	N
N	T 329	N	N	N	T 420

325-351	352-378	379-405	406-432	433-459	460-486
T 300	T 204	T 308	T 251	T 270	T 218
T 341	T 192	T 214	T 203	C 220	C 186
T 234	T 216	T 269	T 233	T 220	C 200
T 205	T 197	T 185	N	T 319	T 513
T 322	C 236	T 303	O	T 206	T 237
T 290	N	T 357	T 301	NA 107	T 552
C 283	T 329	T 236	T 207	T 436	T 211
T 239	TA 114	C 228	T 448	T 428	T 191
N	NA -15	T 261	N	T 365	NA 105
T 392	T 352	T 222	TA -51	T 196	T 223
T 258	T 314	T 167	C 246	T 423	N
T 162	T 238	T 231	N	T 335	T 214
T 183	T 221	T 260	T 333	N	O
T 205	T 220	T 447	T 252	T 196	T 217
T 506	C 195	C 235	T 259	TA 61	T 301
T 538	T 220	T 362	T 379	T 186	C 203
N	T 212	C 222	T 526	T 238	N
O	T 441	N	T 1346	T 264	O
T 440	T 212	T 170	T 237	T 247	T 213
T 335	N	T 322	N	TA 119	T 272
N	T 305	N	T 159	C 221	T 354
T 235	T 404	T 189	T 546	T 213	T 365
T 307	T 235	T 692	T 488	T 211	N
TA 101	N	O	T 204	T 373	T 349
T 170	T 334	NA 85	T 462	T 262	T 204
N	T 355	T 249	O	N	T 370
T 399	N	T 317	C 470	T 225	T 232

487-513	514-540	541-567	568-594	595-621	622-648
N	T 244	T 265	T 323	T 449	T 188
T 174	T 249	T 328	T 277	T 404	T 208
C 165	T 255	C 293	T 469	C 348	C 183
T 204	T 216	T 221	T 236	T 209	T 212
T 198	T 224	T 297	T 246	T 192	T 227
T 174	C 203	T 247	T 230	N	C 191
T 217	T 229	T 191	C 232	T 177	T 219
T 269	T 331	T 296	T 198	C 190	T 399
T 163	T 340	T 506	C 248	C 223	T 369
T 292	T 239	N	T 167	T 340	T 270
C 213	N	C 192	T 341	T 382	T 271
T 229	T 233	T 216	T 241	T 346	T 301
TA 55	T 213	T 227	T 207	T 336	C 212
T 332	T 259	T 315	T 292	C 235	T 235
T 273	N	N	N	T 212	T 328
T 238	T 230	T 225	T 188	T 332	T 276
T 402	TA 123	T 261	T 274	T 250	T 302
C 234	T 205	T 306	TA 107	C 219	T 386
N	T 337	T 195	T 155	C 232	T 375
TA -54	T 248	C 201	T 216	T 179	T 432
T 235	T 232	T 287	T 177	N	C 456
T 250	N	T 221	N	TA 149	T 235
T 266	T 275	T 288	TA -24	T 156	T 217
T 213	TA 121	T 334	TA -175	T 182	T 203
N	C 232	T 346	TA 134	C 156	T 203
T 308	T 214	C 279	T 211	TA 89	T 231
T 400	C 197	T 208	T 385	T 235	C 230

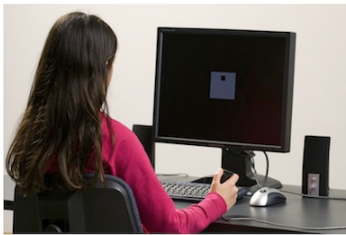
T = Correct response to target O = Omission error A = Anticipatory response
 N = Correct nonresponse to nontarget C = Commission error M = Multiple response
 Green = Post-Commission-error correct response U = User interrupt H = Hardware interrupt

The Test Of Variables of Attention (T.O.V.A.®)

The **Test of Variables of Attention (T.O.V.A.)** is an FDA-cleared, state-of-the-art continuous performance test that provides healthcare professionals with objective measurements of attention and inhibitory control. The T.O.V.A. aids in the assessment of, and evaluation of treatment for, attention deficits, including attention-deficit/hyperactivity disorder (ADHD). T.O.V.A. results are available for children and adults (ages 4 - 80+) and should only be interpreted by qualified professionals.



The T.O.V.A. continuously measures performance during a 10.8-minute task or a 21.6-minute task, depending on age. It records speed, accuracy, and consistency of responses to a series of squares (in the visual T.O.V.A. test) or tones (in the auditory T.O.V.A. test) that are presented in two-second intervals. These measurements (accurate to ± 1 ms) are then compared by age and gender to a normative sample (a sample of people without attention problems). This comparison determines whether the test results are "within normal limits" or not. The T.O.V.A. also compares results to a group of people independently diagnosed with ADHD. The T.O.V.A. report is based on these two comparisons, as well as performance, session, and response validity measures.



If you have questions about this report, please contact the person who provided it to you. For more information about attention and the T.O.V.A., please visit our website at <https://www.tovatest.com/>. To contact us please email info@tovatest.com or call 800.PAY.ATTN (562.594.7700).

ID: **1 Example Subject** (Apr 1, 2006)
Male - 11y 5m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
 Sep 1, 2017 at 12:23 PM

Session, Response, and Performance Validity

This session meets session, response and performance validity criteria.

T.O.V.A. Interpretation

The results of this T.O.V.A. are within normal limits. Please see the Interpretation Notes page for additional information.

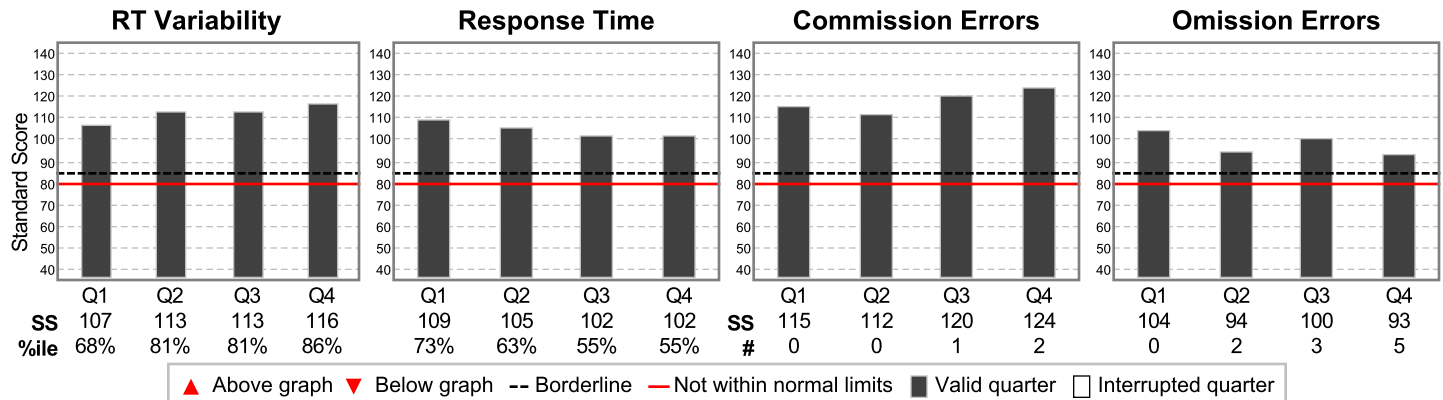
Treatment

10.0mg dose of Adderall xr taken 2.5 hours before testing.

Comparison to the Normative Sample

These scores compare this subject's performance to the performance of individuals of the same gender and age in the T.O.V.A. Normative Sample, a study of individuals who did not have attention problems.

Results are reported as standard scores (average standard = 100; standard deviation = 15). Standard scores above 85 are considered to be in the normal range, scores between 80 and 85 are considered borderline, and scores below 80 are considered not within normal limits. Scores less than 70 are considered significantly below normal range. Standard scores less than 40 are more than 4 standard deviations from normal, and are denoted as "<40".



Quarters, Halves and the Total are independently calculated and are not averages. Any Quarter, Half or Total that is Borderline or Not Within Normal Limits causes the Interpretation to be Borderline or Not Within Normal Limits. See the Interpretation Notes page for more information on these variables and on the subject's performance.

	Quarter				Half		Total
	1	2	3	4	1	2	
RT Variability	107	113	113	116	112	116	119
Response Time	109	105	102	102	108	102	103
Commission Errors	115	112	120	124	114	123	122
Omission Errors	104	94	100	93	99	97	98
	Infrequent		Frequent				

Key: Borderline, Not within normal limits, Invalid

ID: 1 **Example Subject** (Apr 1, 2006)
Male - 11y 5m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
Sep 1, 2017 at 12:23 PM

Session comments

Test to compare baseline to treatment.

Session, Response, and Performance Validity

Performance Validity

Performance Validity is applicable only to ages 17 or above.

Notes on the Comparison to the Normative Sample

Variability is a precise measure of variations in correct response times, and measures the consistency of response times. **Variability was within normal limits.**

Response Time is the average speed of correct responses to targets, and is a measure of information processing speed. **Response Time was within normal limits.**

Commission Errors occur when the subject incorrectly responds to a nontarget, and are a measure of inhibitory control. **Commission Errors were within normal limits.**

Omission Errors occur when the subject does not respond to a target, and are a measure of sustained attention. **Omission Errors were within normal limits.**

The overall test performance is within normal limits. However, the clinician must take into account other factors that may produce a false negative result, including use of medication, caffeine, nicotine, strong motivation, or other possible compensations.

Other Notes

Consider administering an Auditory T.O.V.A. to this subject for a more comprehensive assessment of attention. This is important because an individual can have a within normal limits result on one test, and a not within normal limits result on the other.

ID: **1 Example Subject** (Apr 1, 2006)
Male - 11y 5m 0d

Visual T.O.V.A. (v9.0-78 sn30000)
 Sep 1, 2017 at 12:23 PM

Treatment

10.0mg dose of Adderall xr taken 2.5 hours before testing.

Attention Comparison Score

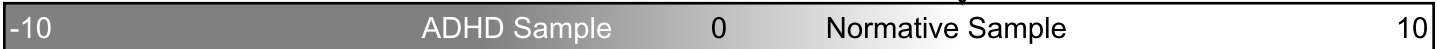
The Attention Comparison Score (ACS) is a subset of T.O.V.A. variables used to compare the subject's performance to a sample of individuals independently diagnosed with ADHD. Scores below 0 suggest a performance more similar to that of individuals with ADHD.

Note that the ACS does not include important variables from the Comparison to the Normative Sample. In order to understand the overall test results, the ACS should always be used with the Comparison to the Normative Sample, found on the Summary page. In particular, when the ACS is above zero and the Comparison to the Normative Sample is not within normal limits, the results should be considered not within normal limits.

The ACS is calculated by summing the following Z scores:

Response Time (Half 1)	0.50
D Prime (Half 2)	-0.16
Variability (Total)	1.24
Calibration constant	1.80
Attention Comparison Score	3.38

3.38



ID: **1 Example Subject** (Apr 1, 2006)
Male - 11y 5m 0d

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 Sep 1, 2017 at 12:23 PM

This page contains tabulated raw data and documents T.O.V.A. session parameters.

		Quarter				Half		Total
		1	2	3	4	1	2	
RT Variability	ms	86	70	81	74	81	78	82
Response Time	ms	391	428	355	348	409	352	364
Post-commission responses	#	0	0	1	2	0	3	3
Response Time	ms	0	0	369	374	0	372	372
Variability	ms	0	0	0	50	0	40	40
Commission Errors	#	0/126	0/126	1/36	2/36	0/252	3/72	3/324
Percentage	%	0	0	2.8	5.6	0	4.2	0.9
Response Time	ms	0	0	258	200	0	220	220
Omission Errors	#	0/36	2/36	3/126	5/126	2/72	8/252	10/324
Percentage	%	0	5.6	2.4	4	2.8	3.2	3.1
D Prime		8.53	5.86	3.9	3.35	6.18	3.59	4.22
Standard Score		122	97	97	97	101	98	95
Beta		1	2503.57	0.88	0.76	1425.08	0.8	2.8
Anticipatory	%	0	0	0	0	0	0	0
To Nontargets	#	0	0	0	0	0	0	0
To Targets	#	0	0	0	0	0	0	0
Multiple Responses	#	0	0	0	0	0	0	0
Total Correct	#	162/162	160/162	158/162	155/162	322/324	313/324	635/648
Percentage	%	100	98.8	97.5	95.7	99.4	96.6	98
Skew	ms	26	48	46	60	30	39	55
User Interrupts	#	0	0	0	0	0	0	0
Hardware errors	#	0	0	0	0	0	0	0

Infrequent

Frequent

Session parameters

Format: 1 (standard)
 ISI: 2000 ms
 Stimulus On Time: 200 ms
 Stimulus Off Time: 300 ms
 Anticipatory Cutoff: 150 ms

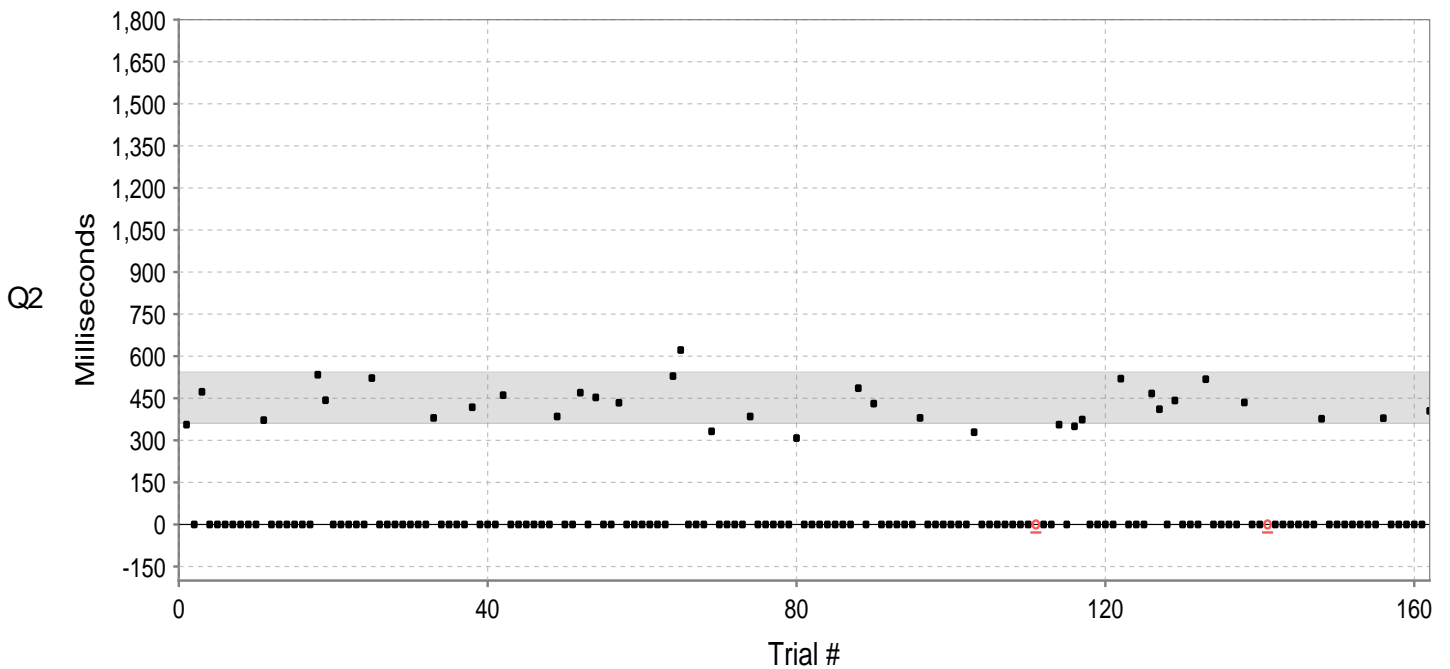
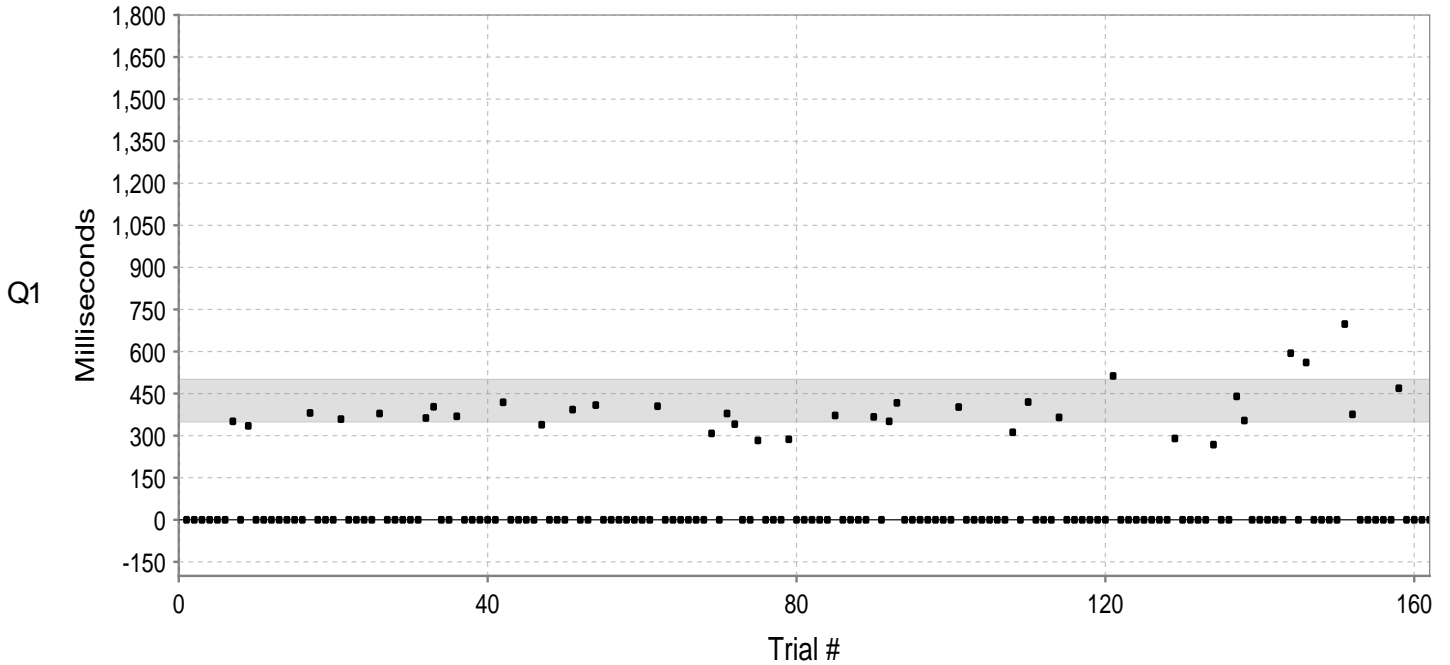
Session information

Tester:
 Import Filename: example-treatment-male-11.tova (3 / 3)
 Import Date: Aug 23, 2022 11:43:46 AM
 Errors/Warnings:

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Male - 11y 5m 0d

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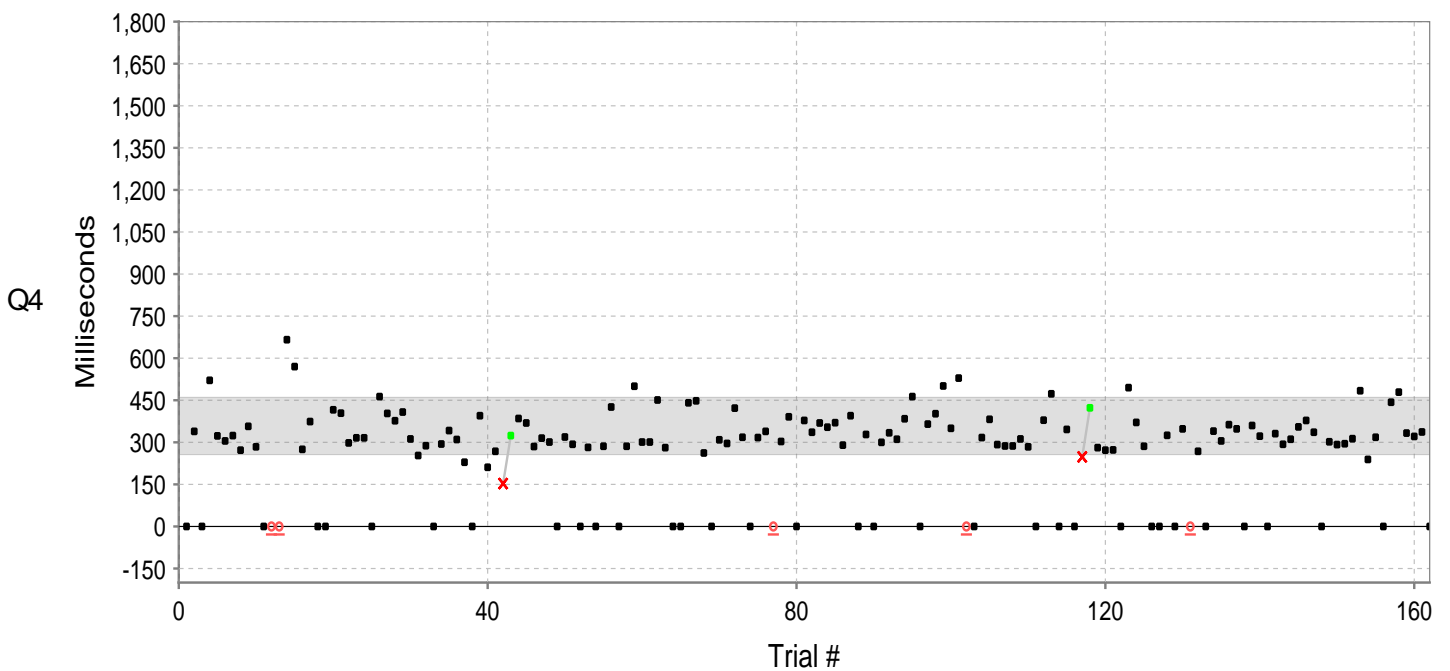
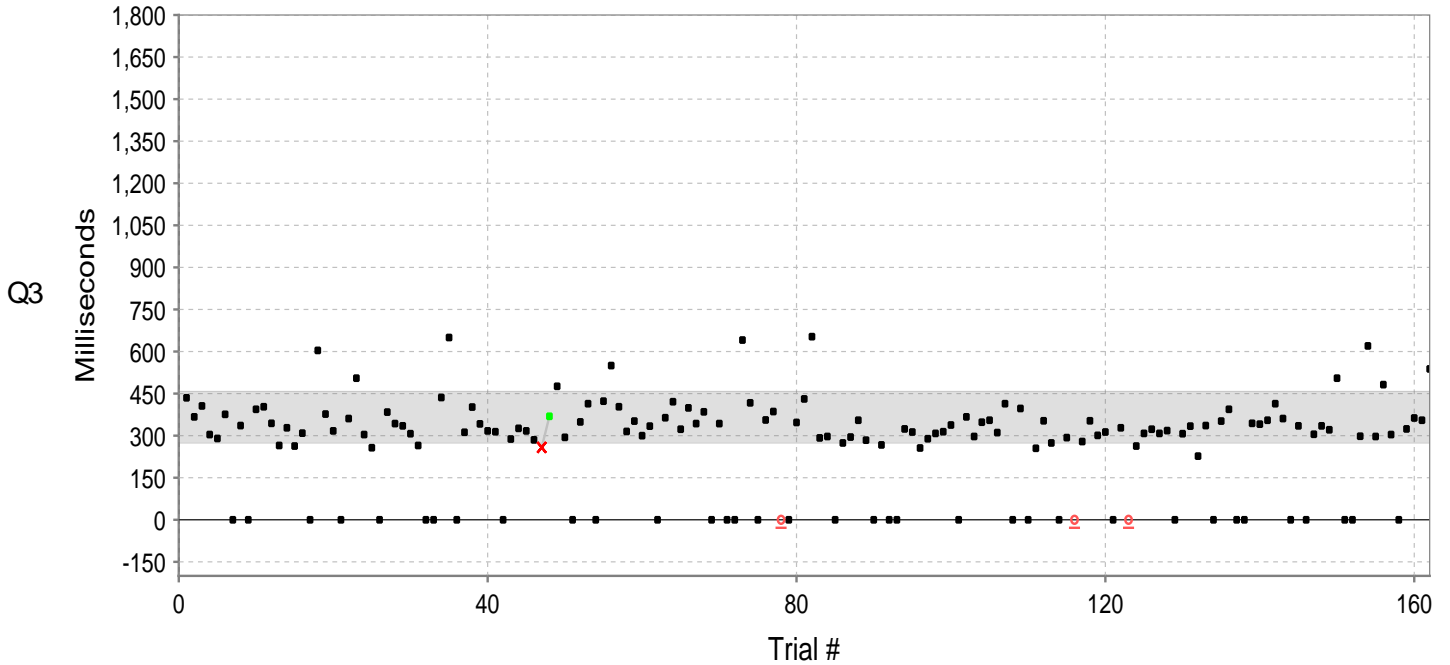


■ Correct response	■ Correct non-response	× Commission error	○ Omission error	■ Anticipatory response
■ Post-commission error correct response	— Slower post-commission RT	— Faster post-commission RT		
▲△ Off-scale resp./error	■ Normative range	Interruption	3 10s Response gap (# Targets and Sec)	

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N	N	N	N	N	N
N	N	N	N	T 420	T 440
N	N	N	N	N	T 354
N	N	N	T 372	N	N
N	T 363	N	N	N	N
N	T 403	N	N	T 365	N
T 351	N	N	N	N	N
N	N	T 405	N	N	N
T 335	T 369	N	T 367	N	T 594
N	N	N	N	N	N
N	N	N	T 351	N	T 561
N	N	N	T 417	N	N
N	N	N	N	T 513	N
N	N	N	N	N	N
N	T 419	T 308	N	N	N
N	N	N	N	N	T 698
T 381	N	T 379	N	N	T 376
N	N	T 341	N	N	N
N	N	N	N	N	N
N	T 339	N	T 402	N	N
T 359	N	T 283	N	T 290	N
N	N	N	N	N	T 469
N	T 393	N	N	N	N
N	N	T 287	N	N	N
T 379	N	N	N	T 268	N
N	T 409	N	T 312	N	N

163-189	190-216	217-243	244-270	271-297	298-324
T 356	N	N	N	N	N
N	N	N	N	N	N
T 473	N	T 434	N	○	T 435
N	N	N	N	N	N
N	N	N	N	N	N
N	T 380	N	N	T 356	○
N	N	N	T 486	N	N
N	N	N	N	T 350	N
N	N	T 529	T 431	T 374	N
T 372	T 418	T 622	N	N	N
N	N	N	N	N	N
N	N	N	N	N	T 377
N	N	N	N	T 520	N
N	T 461	T 332	T 380	N	N
N	N	N	N	N	N
N	N	N	N	N	N
T 534	N	N	N	T 467	N
T 443	N	N	N	T 411	N
N	N	T 385	N	N	N
N	N	N	N	T 442	T 379
N	T 385	N	T 329	N	N
N	N	N	N	N	N
N	N	N	N	N	N
T 522	T 470	N	N	T 518	N
N	N	T 308	N	N	N
N	T 453	N	N	N	T 405

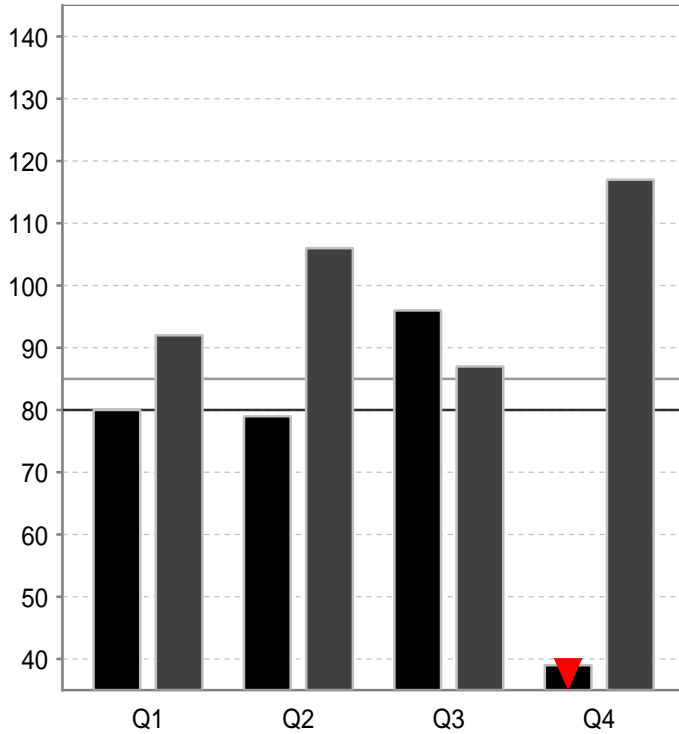
325-351	352-378	379-405	406-432	433-459	460-486
T 435	T 343	T 423	T 653	T 397	T 394
T 367	T 335	T 550	T 292	N	N
T 406	T 307	T 403	T 297	T 255	N
T 304	T 265	T 315	N	T 353	T 344
T 290	N	T 352	T 274	T 274	T 341
T 376	N	T 300	T 295	N	T 355
N	T 436	T 334	T 355	T 293	T 414
T 336	T 650	N	T 284	○	T 361
N	N	T 364	N	T 279	N
T 394	T 312	T 421	T 267	T 353	T 335
T 403	T 402	T 323	N	T 301	N
T 344	T 342	T 399	N	T 313	T 305
T 265	T 317	T 343	T 324	N	T 335
T 328	T 314	T 385	T 313	T 328	T 321
T 263	N	N	T 256	○	T 505
T 309	T 288	T 343	T 289	T 263	N
N	T 326	N	T 308	T 308	N
T 604	T 317	N	T 314	T 323	T 298
T 377	T 285	T 641	T 338	T 308	T 620
T 317	C 258	T 417	N	T 318	T 297
N	T 369	N	T 367	N	T 482
T 361	T 476	T 356	T 297	T 307	T 304
T 505	T 294	T 386	T 348	T 334	N
T 304	N	○	T 355	T 227	T 324
T 257	T 349	N	T 311	T 336	T 363
N	T 414	T 347	T 414	N	T 355
T 384	N	T 431	N	T 352	T 538

487-513	514-540	541-567	568-594	595-621	622-648
N	T 377	T 286	T 336	T 312	T 363
T 339	T 408	T 426	T 369	T 284	T 348
N	T 312	N	T 354	N	N
T 521	T 253	T 286	T 370	T 379	T 360
T 323	T 288	T 500	T 290	T 473	T 322
T 305	N	T 301	T 395	N	N
T 324	T 294	T 301	N	T 346	T 331
T 272	T 342	T 451	T 328	N	T 293
T 357	T 310	T 281	N	C 248	T 311
T 284	T 229	N	T 300	T 423	T 355
N	N	N	T 334	T 281	T 378
○	T 395	T 441	T 311	T 272	T 336
○	T 211	T 448	T 384	T 273	N
T 666	T 268	T 262	T 463	N	T 302
T 570	C 153	N	N	T 495	T 292
T 275	T 324	T 309	T 365	T 371	T 295
T 374	T 385	T 296	T 402	T 286	T 313
N	T 369	T 422	T 501	N	T 484
N	T 285	T 318	T 350	N	T 239
T 416	T 315	N	T 529	T 325	T 318
T 404	T 301	T 317	○	N	N
T 298	N	T 339	N	T 348	T 443
T 316	T 319	○	T 317	○	T 479
T 316	T 293	T 303	T 382	T 268	T 333
N	N	T 391	T 292	N	T 321
T 463	T 282	N	T 287	T 340	T 337
T 403	N	T 378	T 287	T 305	N

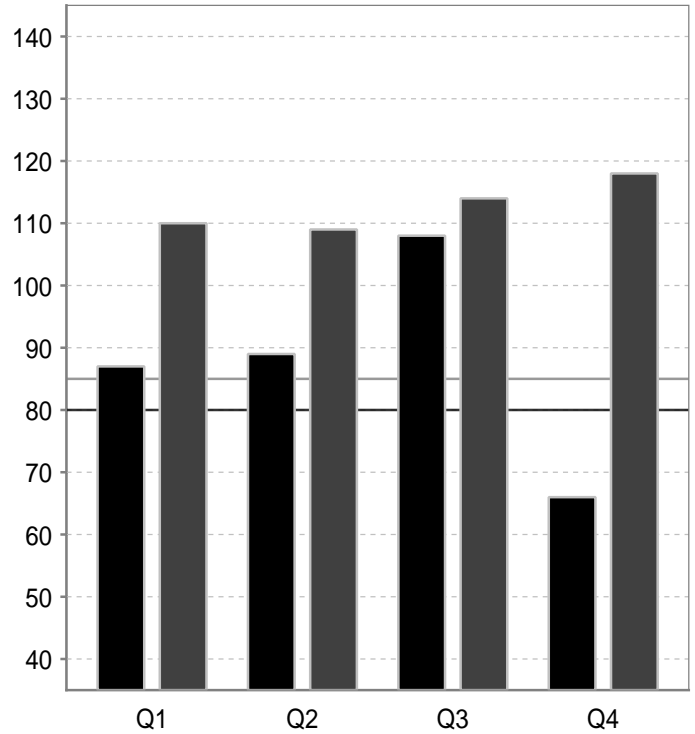
T = Correct response to target ○ = Omission error A = Anticipatory response
 N = Correct nonresponse to nontarget C = Commission error M = Multiple response
 Green = Post-Commission-error correct response U = User interrupt H = Hardware interrupt

■ Example Subject, 11.25 y, Jul 1, 2017 11:06 AM, Visual
■ Example Subject, 11.33 y, Aug 1, 2017 10:10 AM, Visual, Adderall(50.0mg)

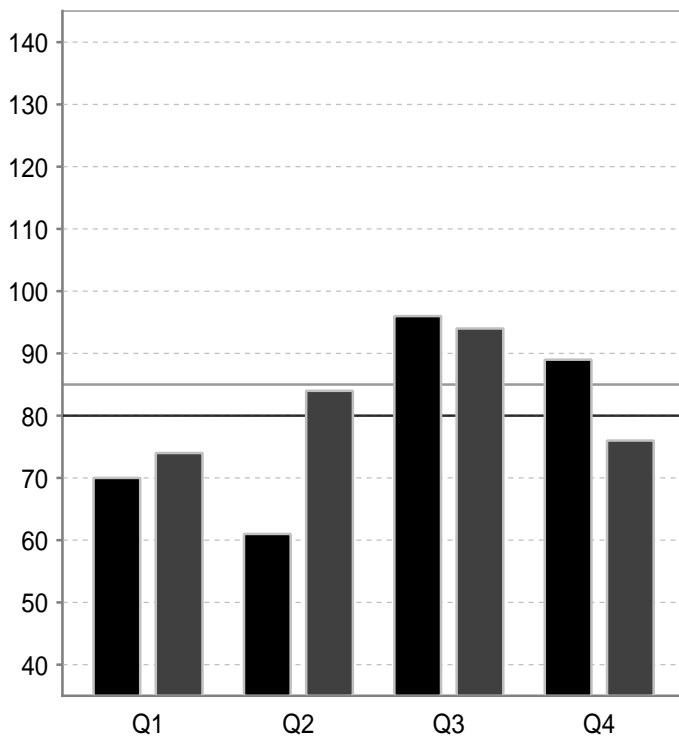
RT Variability



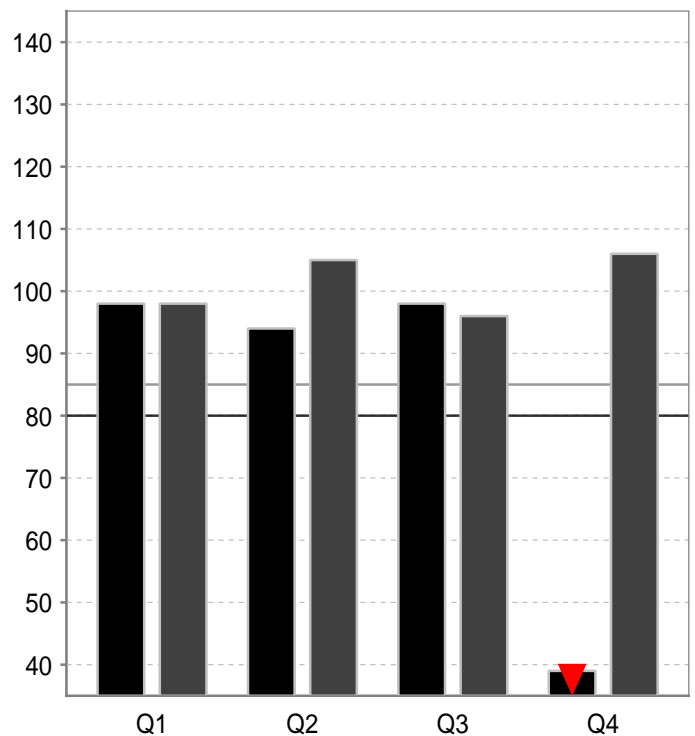
Response Time



Commission Errors



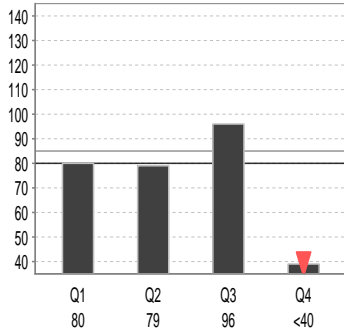
Omission Errors



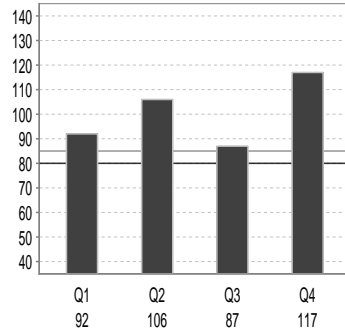
Example Subject
11.25 y, 7/1/17 11:06 AM
Visual
No challenge

Example Subject
11.33 y, 8/1/17 10:10 AM
Visual
Adderall(50.0mg)

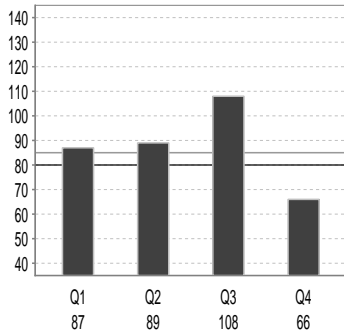
RT Variability



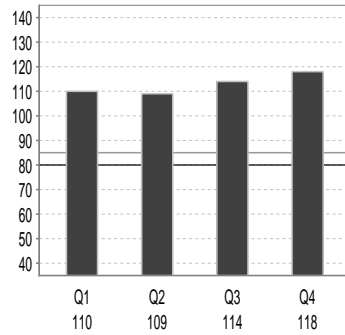
RT Variability



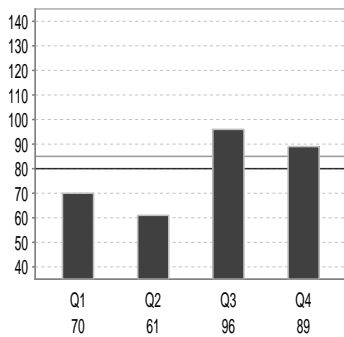
Response Time



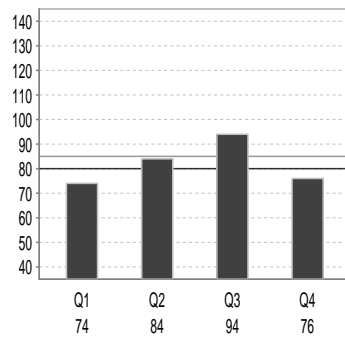
Response Time



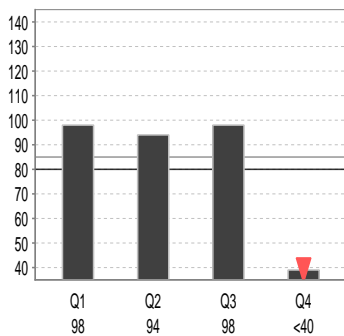
Commission Errors



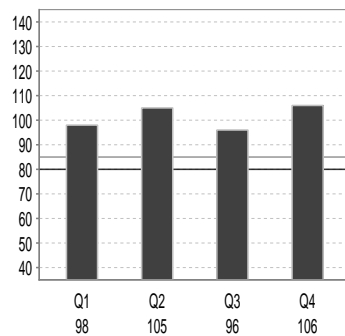
Commission Errors



Omission Errors

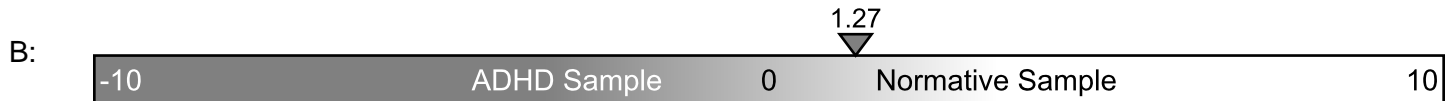
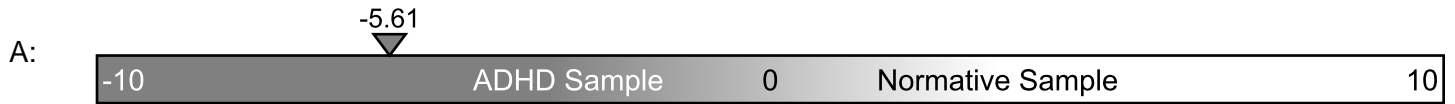


Omission Errors



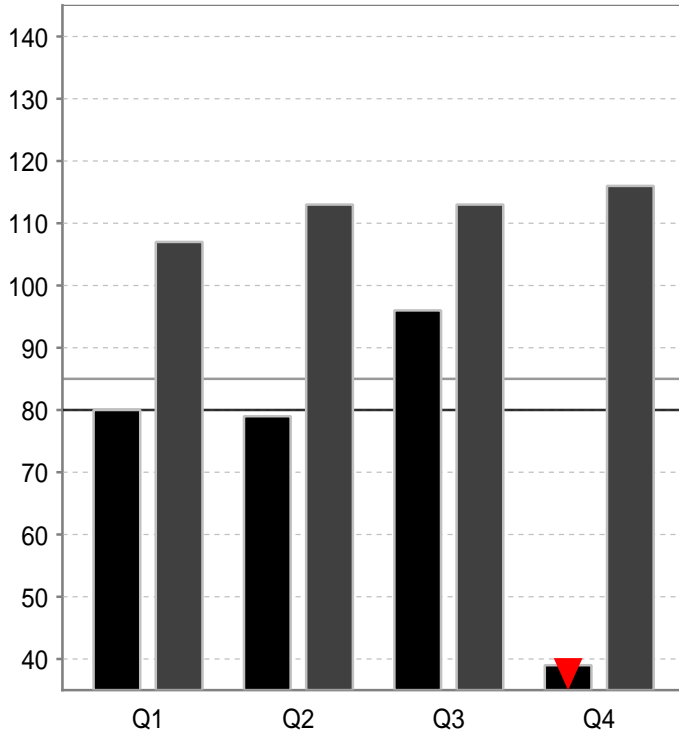
A: Example Subject, 11.25 y, 7/1/17 11:06 AM, Visual, No challenge

B: Example Subject, 11.33 y, 8/1/17 10:10 AM, Visual, Adderall(50.0mg)

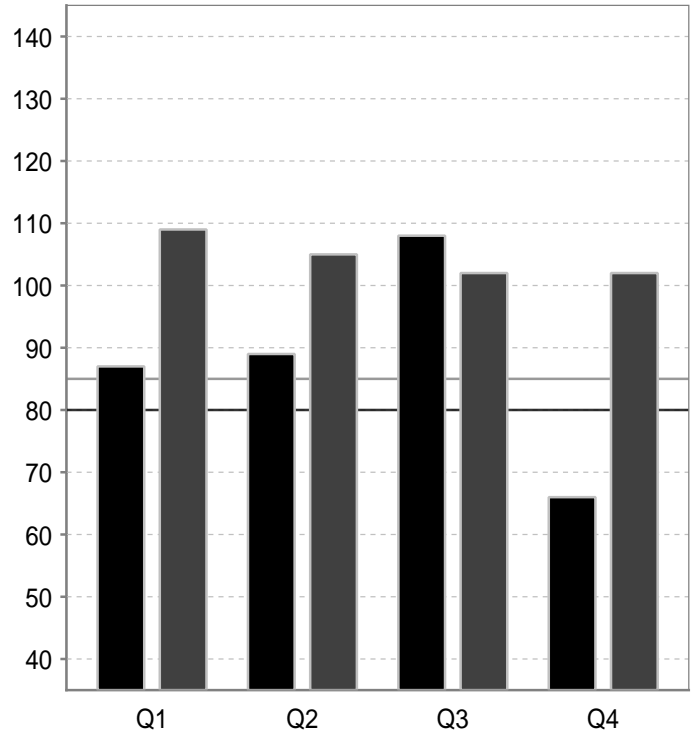


■ Example Subject, 11.25 y, Jul 1, 2017 11:06 AM, Visual
■ Example Subject, 11.42 y, Sep 1, 2017 12:23 PM, Visual, Adderall xr(10.0mg)

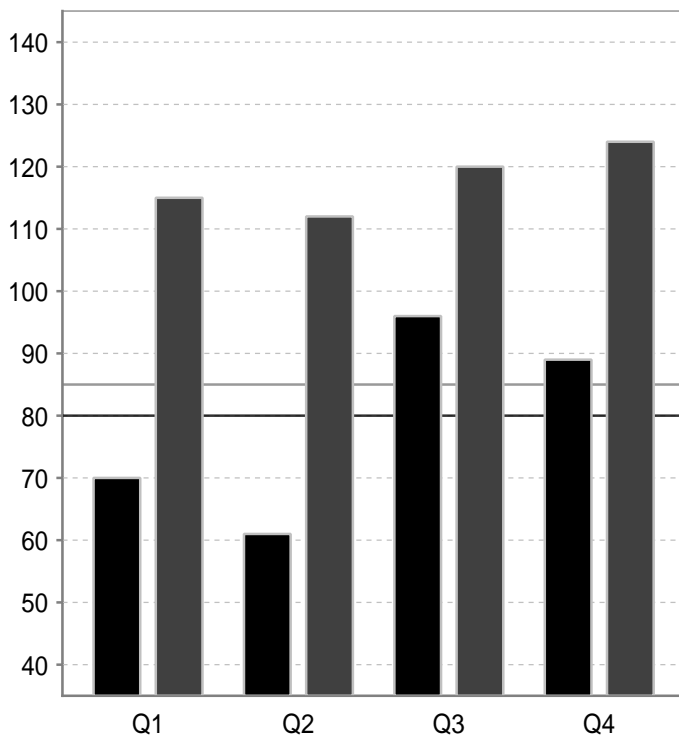
RT Variability



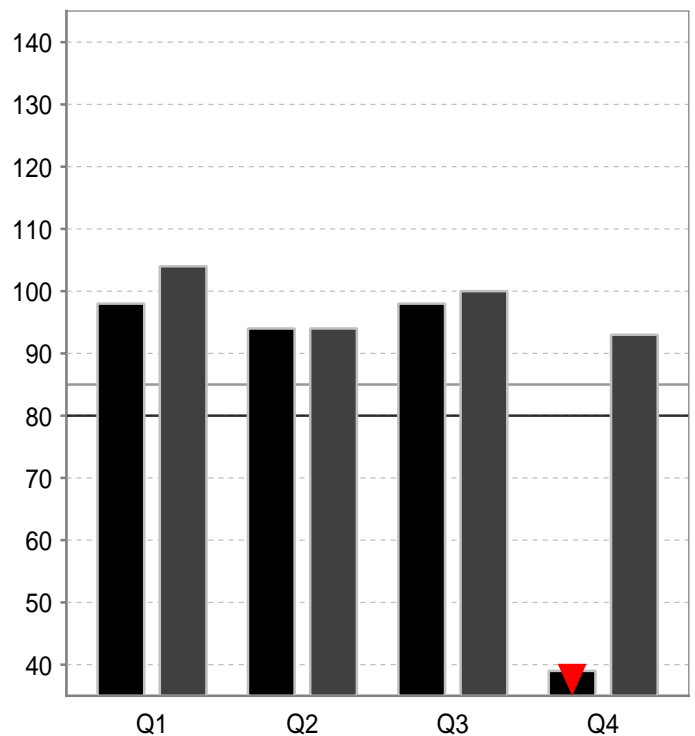
Response Time



Commission Errors



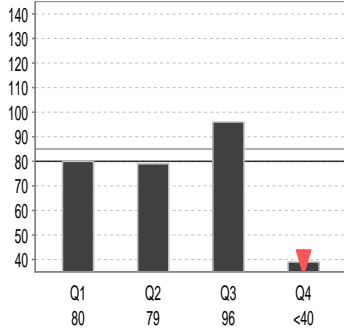
Omission Errors



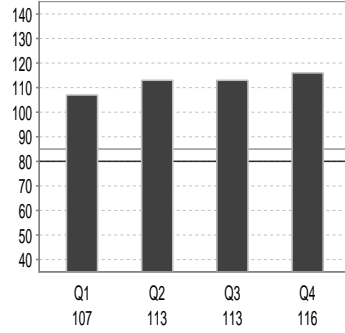
Example Subject
11.25 y, 7/1/17 11:06 AM
Visual
No challenge

Example Subject
11.42 y, 9/1/17 12:23 PM
Visual
Adderall xr(10.0mg)

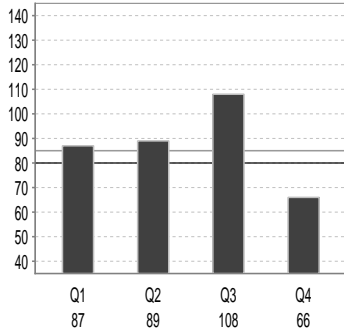
RT Variability



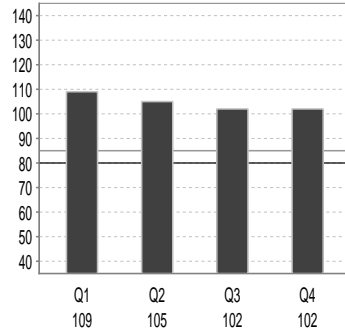
RT Variability



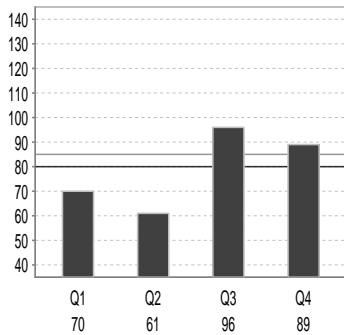
Response Time



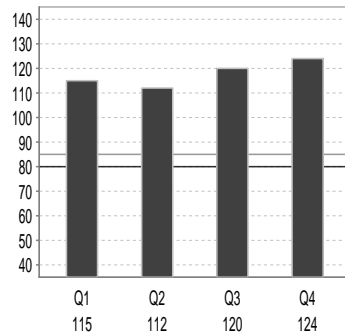
Response Time



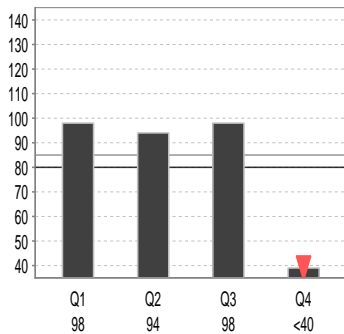
Commission Errors



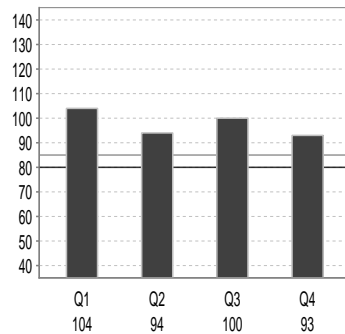
Commission Errors



Omission Errors



Omission Errors



A: Example Subject, 11.25 y, 7/1/17 11:06 AM, Visual, No challenge

B: Example Subject, 11.42 y, 9/1/17 12:23 PM, Visual, Adderall xr(10.0mg)

