Motion Sickness Susceptibility Questionnaire Short-form (MSSQ-Short)

1. Please State Your **Age** ..... Years. *2.* Please State Your Sex (tick box) **Male** [ ] **Female** [ ]

This questionnaire is designed to find out how susceptible to motion sickness you are, and what sorts of motion are most effective in causing that sickness. Sickness here means feeling queasy or nauseated or actually vomiting.

Your CHILDHOOD Experience Only (before 12 years of age), for each of the following types of transport or entertainment please indicate:

3. **As a CHILD (before age 12),** how often you **Felt Sick or Nauseated** (tick boxes):

	Not Applicable - Never Travelled	**Never Felt Sick**	**Rarely Felt Sick**	**Sometimes Felt Sick**	**Frequently Felt Sick**
Cars					
Buses or Coaches					
Trains					
Aircraft					
Small Boats					
Ships, e.g. Channel Ferries					
Swings in playgrounds					
Roundabouts in playgrounds					
Big Dippers, Funfair Rides					
	t	0	1	2	3

Your Experience over the LAST 10 YEARS (approximately), for each of the following types of transport or entertainment please indicate:

4. **Over the LAST 10 YEARS,** how often you **Felt Sick or Nauseated** (tick boxes):

	Not Applicable - Never Travelled	**Never Felt Sick**	**Rarely Felt Sick**	**Sometimes Felt Sick**	**Frequently Felt Sick**
Cars					
Buses or Coaches					
Trains					
Aircraft					
Small Boats					
Ships, e.g. Channel Ferries					
Swings in playgrounds					
Roundabouts in playgrounds					
Big Dippers, Funfair Rides					
	t	0	1	2	3

Scoring the MSSQ- Short

Section A (Child) (Question 3)

Score the number of types of transportation not experienced (i.e., total the number of ticks in the 't' column, maximum is 9).

Total the sickness scores for each mode of transportation, i.e. the nine types from 'cars' to 'big dippers' (use the 0-3 number score key at bottom, those scores in the 't' column count as zeroes).

MSA = (total sickness score child) x (9) / (9 - number of types not experienced as a child)

Note 1. Where a subject has not experienced any forms of transport a division by zero error occurs. It is not possible to estimate this subject's motion sickness susceptibility in the absence of any relevant motion exposure.
Note 2. The Section A (Child) score can be used as a pre-morbid indicator of motion sickness susceptibility in patients with vestibular disease.

Section B (Adult) (Question 4)

Repeat as for section A but using the data from section B.

MSB = (total sickness score adult) x (9) / (9 - number of types not experienced as an adult)

Raw Score MSSQ-Short

Total the section A (Child) MSA score and the section B (Adult) MSB score to give the MSSQ-Short raw score (possible range from minimum 0 to maximum 54, the maximum being unlikely)

MSSQ raw score = MSA + MSB

Percentile Score MSSQ-Short

The raw to percentile conversions are given below in the Table 1 of Statistics & Figure 1. Use interpolation where necessary.

Alternatively a close approximation is given by the fitted polynomial where y is percentile; x is raw score

$y = a.x + b.x^2 + c.x^3 + d.x^4$

a = 5.1160923 b = -0.055169904
c = -0.00067784495 d = 1.0714752e-005

Table 1. Means and Percentile Conversion Statistics for the MSSQ-Short (n=257)

Percentiles Conversion	Raw Scores MSSQ-Short		
	Child Section A	Adult Section B	Total A+B
0	0	0	0
10	.0	.0	.8
20	2.0	1.0	3.0
30	4.0	1.3	7.0
40	5.6	2.6	9.0
50	7.0	3.7	11.3
60	9.0	6.0	14.1
70	11.0	7.0	17.9
80	13.0	9.0	21.6
90	16.0	12.0	25.9
95	20.0	15.0	30.4
100	23.6	21.0	44.6
Mean	7.75	5.11	12.90
Std. Deviation	5.94	4.84	9.90

Table note: numbers are rounded

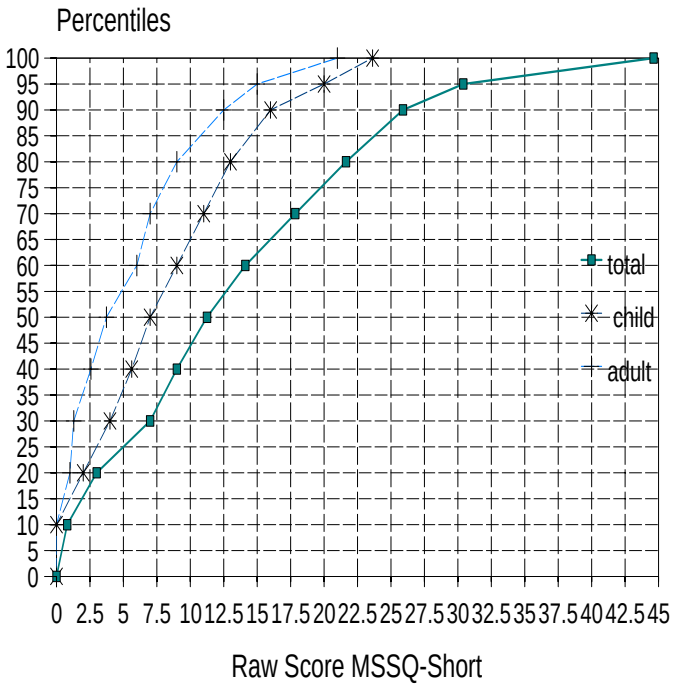

Figure 1. Cumulative distribution Percentiles of the Raw Scores of the MSSQ-Short (n=257 subjects).

Development, Normalisation & Validation of the MSSQ-Short (Golding, 2006)

Background Motion sickness susceptibility questionnaires (MSSQ), sometimes called motion history questionnaires, predict individual differences in motion sickness caused by a variety of stimuli. The original "Reason & Brand MSSQ" (Reason, 1968; Reason & Brand, 1975) had perhaps the best proven track record in the world for motion sickness research. It was subsequently revised, renormalized & revalidated (Golding, 1998). The aim was to develop a short version of the MSSQ, denoted "MSSQ-Short".

Methods Development used repeated item analysis, and various scoring methods of the MSSQ (Golding, 1998). Retained were: motion types (cars, boats, planes, trains, funfair rides, etc); corrections for motion type exposure with a much simplified format; sickness severity weightings; childhood versus adult experiences. New items such as visual/optokinetic items (cinerama, virtual reality, etc), were introduced but then excluded since they had low sickness prevalence & added little information. However they could become important in the future. Norms and percentiles were produced (n=257). Predictive validity used controlled motions representing all classes of motion sickness provocative stimuli (total n=178): cross-coupled (Coriolis); 0.2Hz frequency translational oscillation; off-vertical axis rotation (OVAR); visual-motion simulator.

Results Predictive validity for motion was median r =0.51. The relationship between MSSQ-Short and other non-motion sources of nausea and vomiting (e.g. headaches, food, stress, viral, etc) in the last 12 months was r=0.2 ($p<0.01$). Reliability: Cronbach's alpha was 0.87; Test-retest reliability was around r=0.9; Part A (child) with Part B (adult) was r=0.68.

Conclusions The MSSQ-Short provides reliability with an efficient compromise between length (reduced time cost) and validity (predicted motion susceptibility). Language variants include French, Italian, Spanish, Dutch, Flemish, German, Russian and Chinese.

References

Reason JT. (1968) Relations between motion sickness susceptibility, the spiral after-effect and loudness estimation. **Br J Psychol**; 59: 385-93.

Reason JT & Brand JJ. (1975) **Motion sickness**. London: Academic Press.

Golding JF. (1998) Motion sickness susceptibility questionnaire revised and its relationship to other forms of sickness. **Brain Research Bulletin**, 47: 507-516.

Golding JF. (2006) Predicting Individual Differences in Motion Sickness Susceptibility by Questionnaire. **Personality and Individual differences,** 41: 237-248**.**