

SUPPLEMENTARY MATERIAL

A Subarachnoid Haemorrhage-Specific Outcome Tool

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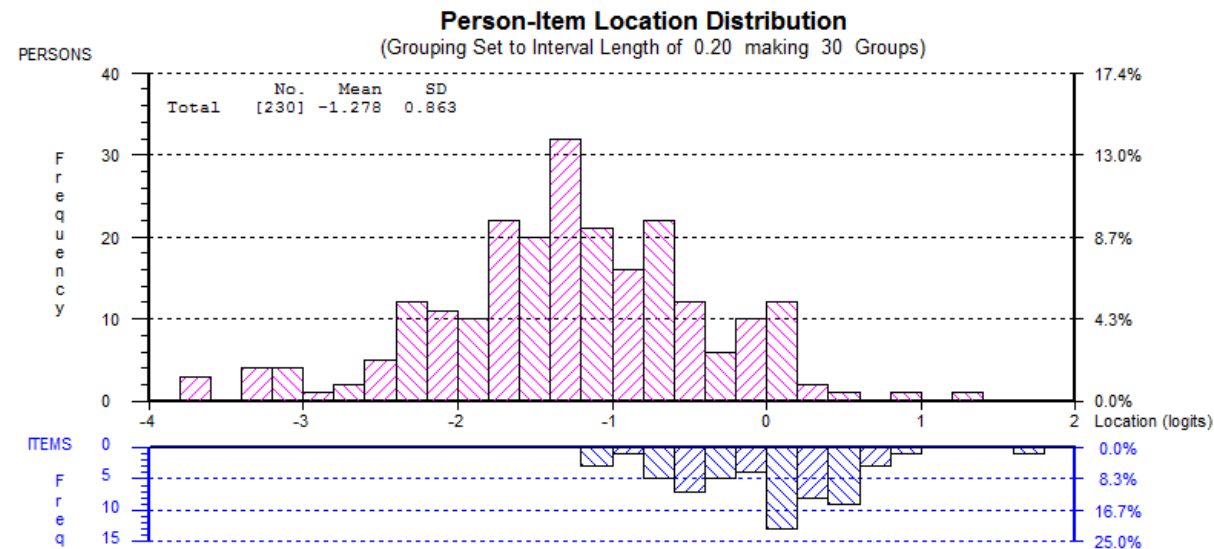
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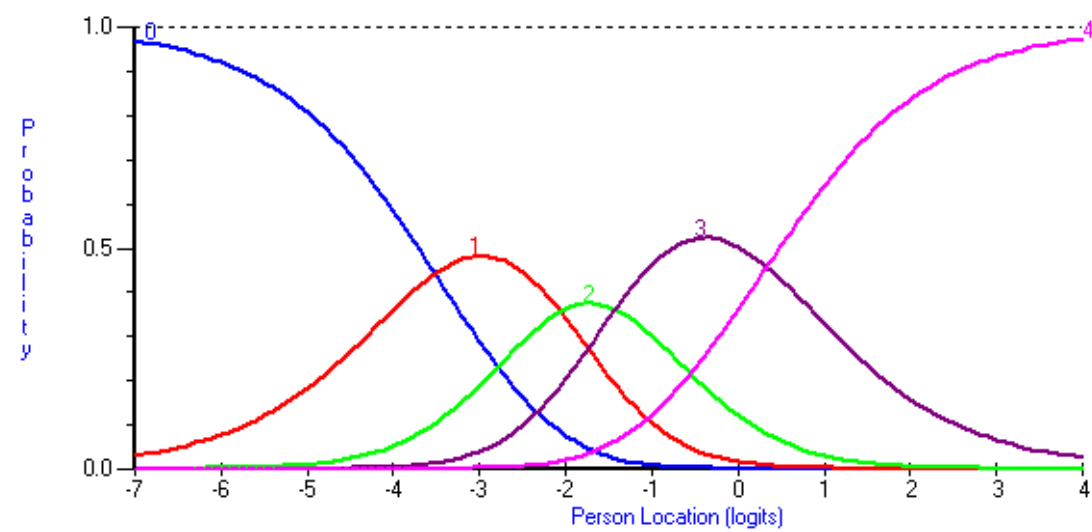
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Supplementary Figure 1. Person-Item Location Distribution Map

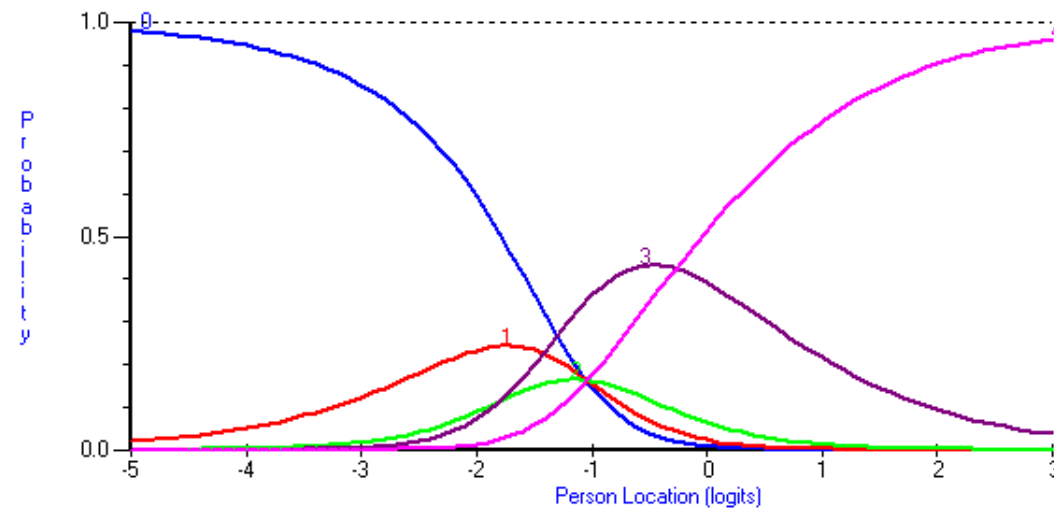


Relative distribution of location estimates for participants with non-extreme scores (upper red histogram) and the 60 SAHOT items (lower blue histogram) mapped on the same continuum of SAH impact. The height of each histogram bar reflects the number of persons or items whose location estimates fall in the same region of the continuum. In this graph, the grouping function for such regions is set to intervals of 0.20 logits.

Supplementary Figure 2A. Expected ordering of HASH-OT response categories

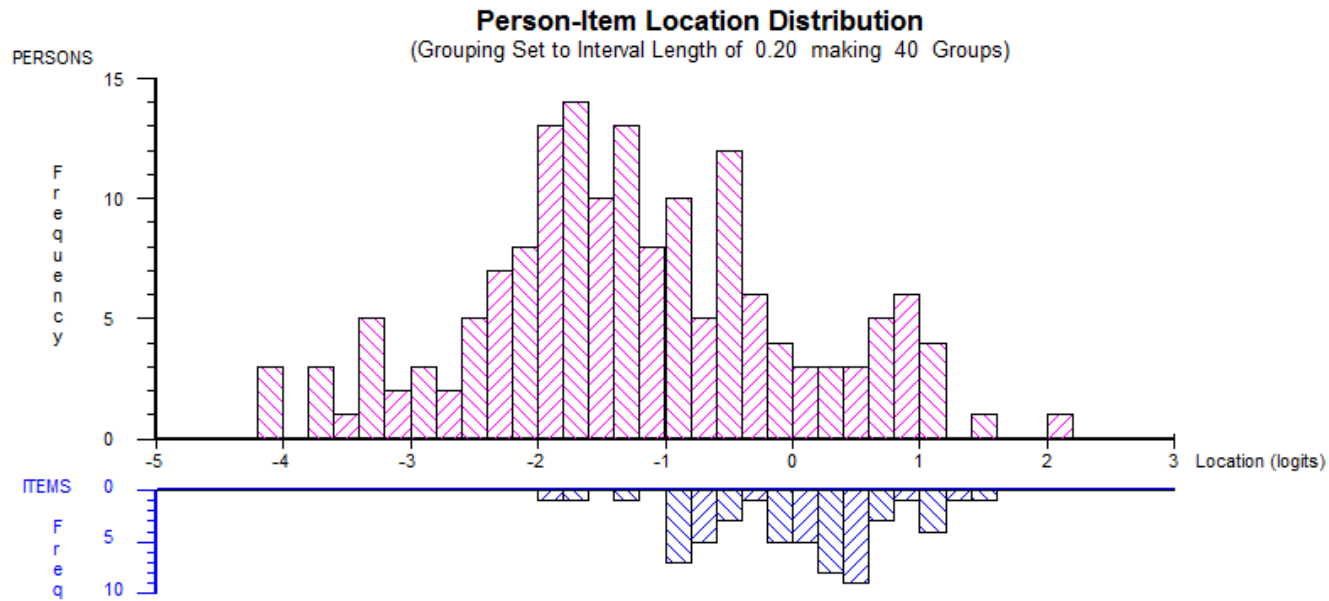


Supplementary Figure 2B. Observed ordering of HASH-OT response categories



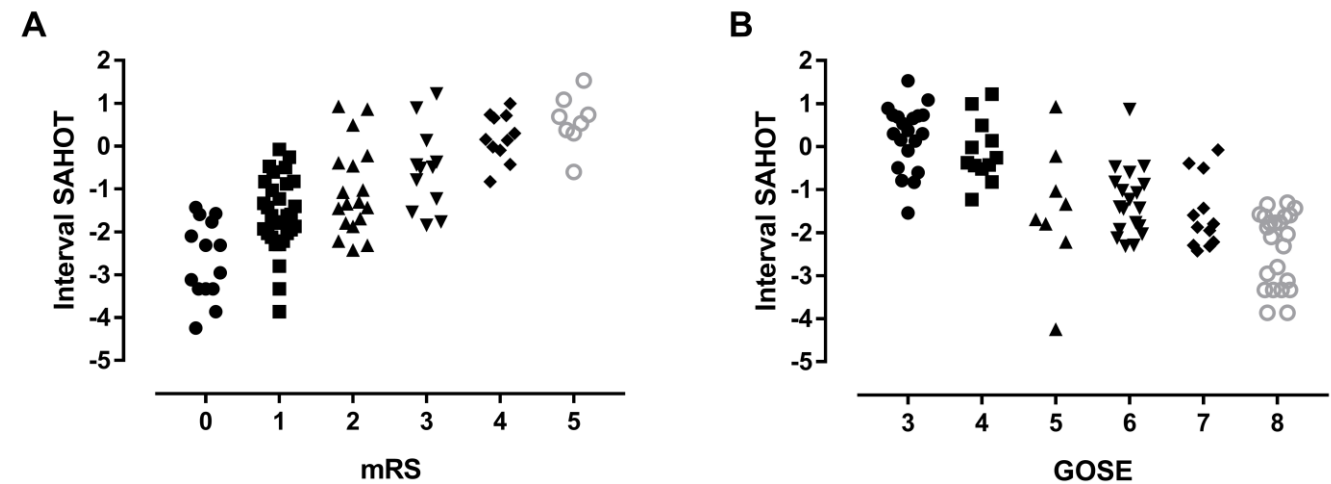
Category Probability Curves (CPCs) depict the probability (y-axis) of being graded in consecutive response categories (coloured lines) with increasing strength (x-axis). Figure 2a shows how the probability of being graded in each of the 5 HASH-OT categories should follow a logical ordered sequence from less to more. Figure 2b shows that in this item, response category 1 (red curve) and 2 (green curve) are never the most likely category for a patient to be graded in, at any level of SAH impact. Thus, the sequential ordering of the 5 categories did not work as intended.

Supplementary Figure 3. Person-Item Location Distribution Map (Aneurysmal-only SAH)



Relative distribution of location estimates for participants with non-extreme scores (upper red histogram) and the 56 SAHOT items (lower blue histogram) mapped on the same continuum of SAH impact. The height of each histogram bar reflects the number of persons or items whose location estimates fall in the same region of the continuum. In this graph, the grouping function for such regions is set to intervals of 0.20 logits.

Supplementary Figure 4. Discrimination between individuals (aneurysmal cases only). SAHOT *versus* mRS (A) and GOSE (B).



Supplementary Table 1. Baseline characteristics of patients – aneurysmal cases only. Mean and range^a, median, number and %^b

Number	82
Age (years)^a	58, 21-84
Fisher grade^b	
1	2, 3%
2	5, 6%
3	25, 30%
4	50, 61%
Median, range	4, 1-4
WFNS^b	
1	47, 57%
2	16, 19%
3	3, 4%
4	12, 15%
5	4, 5%
Median, range	1, 1-5
Gender	
male	16, 20%
female	66, 80%

Table 2. Rasch-based scale properties of the 56-item SAHOT (3 item-scoring categories) in aneurysmal-only cases

Scoring range	0-112
Person separation index	0.945
Mean person location (SD)	-1.25 (1.25)
Item category thresholds	46/56 ordered (82%)
Item fit	Fit residuals $>\pm 2.5$ in 10.7%
	χ^2 probability $<$ Bonferroni adjustment in 6/56 items
Excess correlation between item residuals (>0.30)	1.8%

Supplementary Table 3. Convergent and discriminant validity of the SAHOT – aneurysmal cases only

	Correlation coefficient	p
A. Convergent validity: outcome		
mRS	0.743	$<10^{-4}$ **
GOSE	-0.749	$<10^{-4}$ **
CLCE24	0.640	0.003 **
A. Convergent validity: prognosis		
WFNS	0.444	0.026 *
Fisher score	0.217	0.296
Blood clot volume: total	0.419	0.074
Blood clot volume: subarachnoid	0.339	0.156
B. Discriminant validity		
BICRO39	0.321	0.180
Age	0.187	0.371

Supplementary Table 4. Responsiveness of the SAHOT – aneurysmal cases only

Tool	3 month score median (range)	6 month score median (range)	p	Effect size
Interval SAHOT	-1.1 (-2.2 to 1.2)	-1.3 (-3.3 to 0.9)	0.03*	0.28
mRS	1.5 (0 to 4)	1 (0 to 5)	0.89	0.05
GOSE	5 (3 to 8)	5.5 (3 to 8)	0.19	0.36

The 60-item development questionnaire follows next

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Subarachnoid Haemorrhage Outcome Assessment

This form is designed to assess recovery following subarachnoid hemorrhage at this moment in time. The patient and their next of kin should fill in separate forms without consulting each other.

Please think back to how things were before the bleed, and compare this to how the bleed has **IMPACTED** on the following aspects of daily life **NOW** (i.e. this week). Please circle the correct response. If a question is not relevant, please circle “N/A” (Not Applicable).

1. General Aspects of Daily Life

OVERALL FUNCTION	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse
Physical activities of daily life (e.g. walking, climbing stairs)	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse
Work (i.e. number of working hours and how much one can do at work)	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse
Income (gross income)	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse

Driving	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Socializing	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Pursuing previous hobbies	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Household chores	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Days / evenings out	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Quality of relationship with those closest	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Quality of relationships with others	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Doing things on one's own (e.g. shopping, going out)	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Tolerance of crowded, busy or noisy places	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Sleep pattern	No	Small	Moderate	Large	Complete	N/A	Better

(day or night)	Change	Change	Change	Change	Change		Worse
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Sex life	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse

Basic self care (e.g. ability to wash, dress)	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse

Exercise (e.g. sporting activities)	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse

2. Physical Aspects

Physical fatigue / tiredness (i.e. how much one can do before needing to stop to rest)	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse

Balance when walking	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse

Clumsiness (change in handwriting, difficulty with cutlery, knocking things over)	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse

Falls (including trips / stumbling)	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse

Strength / coordination in arms and hands	No	Small	Moderate	Large	Complete	N/A	Better
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	Change	Change	Change	Change	Change		Worse
Strength / coordination in legs	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Pain	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Headaches	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Urinary continence	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Eyesight	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Hearing	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Smell / taste	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Swallowing food or water	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse
Word finding when speaking	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better
							Worse

Easily moved to tearfulness or laughter	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse
Ability to control one's reactions	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse
Irritability	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse
Anxiety	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse
Feelings of fear	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse
Feelings of paranoia	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse
Agitation	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse
Restlessness (Inability to stand still)	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse
Self-confidence	No Change	Small Change	Moderate Change	Large Change	Complete Change	N/A	Better Worse

The final 56-item questionnaire follows next

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SAHOT
SubArachnoid Haemorrhage Outcome Tool

This form is designed to assess recovery following subarachnoid hemorrhage at this moment in time. The patient and their next of kin should fill in separate forms without consulting each other.

- Please think back to how things were BEFORE the bleed, and compare this to how the following aspects of daily life are NOW (i.e. this week).
- Please circle the response that best describes this CHANGE for each aspect.
- If you have not yet tried an activity, or are unsure if you would be able to undertake a task, circle “large/severe change” for the purposes of this questionnaire.
- If you did not do an activity before the bleed, please select “N/A”.

1. General Aspects of Daily Life

OVERALL FUNCTION	No change	Some change	Large or severe change	N/A
Physical activities of daily life (<i>e.g. walking, climbing stairs</i>)	No change	Some change	Large or severe change	N/A
Socializing (<i>with people other than colleagues/family</i>)	No change	Some change	Large or severe change	N/A
Pursuing previous hobbies	No change	Some change	Large or severe change	N/A
Household chores	No change	Some change	Large or severe change	N/A
Days / evenings out	No change	Some change	Large or severe change	N/A
Quality of relationship with those closest	No change	Some change	Large or severe change	N/A
Tick if relationship is now better [] or worse []				
Quality of relationships with others	No change	Some change	Large or severe change	N/A
Doing things on one's own (<i>e.g. shopping, going out</i>)	No change	Some change	Large or severe change	N/A
Coping in crowded, busy or noisy places	No change	Some change	Large or severe change	N/A
Sleep pattern (<i>day or night</i>)	No change	Some change	Large or severe change	N/A



Sex life	No change	Some change	Large or severe change	N/A
Basic self care (e.g. ability to wash, dress)	No change	Some change	Large or severe change	N/A
Recreational exercise	No change	Some change	Large or severe change	N/A

2. Physical Aspects

Physical fatigue / tiredness (i.e. how much one can do before needing to stop to rest)	No change	Some change	Large or severe change	N/A
Balance when walking	No change	Some change	Large or severe change	N/A
Clumsiness (change in handwriting, difficulty with cutlery, knocking things over)	No change	Some change	Large or severe change	N/A
Falls (including trips / stumbling)	No change	Some change	Large or severe change	N/A
Strength / coordination in arms and hands	No change	Some change	Large or severe change	N/A
Strength / coordination in legs	No change	Some change	Large or severe change	N/A
Pain	No change	Some change	Large or severe change	N/A
Urinary continence	No change	Some change	Large or severe change	N/A

Vision (excluding changes in prescription of glasses)	No change	Some change	Large or severe change	N/A
Hearing	No change	Some change	Large or severe change	N/A
Smell / taste	No change	Some change	Large or severe change	N/A
Swallowing food or water	No change	Some change	Large or severe change	N/A
Word finding when speaking	No change	Some change	Large or severe change	N/A

3. Cognitive Aspects

Mental fatigue (i.e. tiredness with mental tasks)	No change	Some change	Large or severe change	N/A
Short-term memory	No change	Some change	Large or severe change	N/A
Long-term memory (i.e. remembering things that happened years ago)	No change	Some change	Large or severe change	N/A
Learning a new skill	No change	Some change	Large or severe change	N/A
Concentration	No change	Some change	Large or severe change	N/A
Distractibility	No change	Some change	Large or severe change	N/A

Multitasking <i>(i.e. doing two or more things at the same time)</i>	No change	Some change	Large or severe change	N/A
Remembering names of familiar people	No change	Some change	Large or severe change	N/A
Recognising faces	No change	Some change	Large or severe change	N/A
Ability to get a point across in conversation	No change	Some change	Large or severe change	N/A
Ability to compromise in discussion with others	No change	Some change	Large or severe change	N/A
Ability to recognise danger	No change	Some change	Large or severe change	N/A
Navigational skills <i>(i.e. getting lost)</i>	No change	Some change	Large or severe change	N/A

4. Behavioural / Psychological Aspects

Low mood	No change	Some change	Large or severe change	N/A
Mood swings	No change	Some change	Large or severe change	N/A
Strength of emotions	No change	Some change	Large or severe change	N/A
Easily moved to tearfulness or laughter	No change	Some change	Large or severe change	N/A

Ability to control one's reactions	No change	Some change	Large or severe change	N/A
Irritability	No change	Some change	Large or severe change	N/A
Anxiety	No change	Some change	Large or severe change	N/A
Feelings of fear	No change	Some change	Large or severe change	N/A
Feelings of paranoia	No change	Some change	Large or severe change	N/A
Agitation	No change	Some change	Large or severe change	N/A
Restlessness (inability to stand still)	No change	Some change	Large or severe change	N/A
Self-confidence	No change	Some change	Large or severe change	N/A
Awareness of others' thoughts, feelings and/or needs	No change	Some change	Large or severe change	N/A
Motivation	No change	Some change	Large or severe change	N/A
Feeling comfortable in new environments	No change	Some change	Large or severe change	N/A
Apathy	No change	Some change	Large or severe change	N/A