



Data Technical Report of the ALSWH: Derived variables not included in datasets

Anne Russell

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Background

The Data Management Group has evaluated the use of many variables derived from items and scales included in surveys. Some have been determined to not be of use and so have not been included in ALSWH data sets.

Documentation of these variables was previously included in the Data Dictionary Supplement but is now included here.



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Lifestyle

Physical Activity– Revised for Survey 1

Age Cohorts	Younger, Mid-age and Older
Surveys	Survey 1
Derived Variable	RevExStat
Definition	Revised measure of recreational physical activity at Survey 1
Source Items (Index numbers)	EX1& EX2 (EXER-001& EXER-002)
Statistical form	Continuous variable
Derived Variables	RevPAGp
Definition	Revised measure of recreational physical activity at Survey 1
Source Items	RevExStat
Statistical form	Categorical variable
Prepared by	Jessica Ford and Wendy Brown
Endorsed	26 November 2003

Source items

EX1: In a NORMAL week, how many times do you engage in VIGOROUS exercise lasting for 20 minutes or more? (exercise which makes you breathe harder or puff and pant, such as netball, squash, jogging, aerobics, vigorous swimming, etc.)

EX2: In a NORMAL week, how many times do you engage in LESS VIGOROUS exercise which lasts for 20 minutes or more? (exercise which does not make you breathe harder or puff and pant, like walking, gardening, swimming and lawn bowls)

Code	Re-code	Response
1	0	Never
2	1	Once a week
3	2.5	Two or three times a week
4	5	Four, five or six times a week
5	7	Once every day
6	10	More than once every day

Derived Variables

The goal is to define a PA score describing the long-term PA levels of individual women across 3 ALSWH surveys as accurately as possible. This requires comparability between the measure at Survey 1 and the measure used in Surveys 2 and 3. This is difficult, as there is no measure of the duration of exercise at Survey 1.

The derivation of the original physical activity score (ExStat) from EX1 and EX2 has been described in Section 2 (see Index Number EXER-015). A revised physical activity score, based on the same items but more comparable with the PA measure at Surveys 2 and 3 is described here. Items are re-coded to estimate the number of times per week each type of activity is undertaken; mostly the mid-point of the response categories (as in the derivation of ExStat).

Duration of 20 minutes was assumed for all activity sessions and all re-coded responses were multiplied by 20. As the survey items provide no information on the duration of exercise sessions, 20-minutes was chosen as this was the duration of activity required to solicit a frequency response.

Responses were then weighted to reflect the metabolic cost (MET) of these activities. One MET is equivalent to resting metabolic rate or sitting quietly; 4 METs is used as the generic value for moderate activity and 7.5 METs is used as the generic value for vigorous activity.¹

A revised recreational physical activity variable (RevExStat) is calculated as the weighted sum of the re-coded values for EX1 and EX2.

$$\text{RevExStat} = (7.5 * 20 * \text{EX1}) + (3 * 20 * \text{EX2})$$

It is important to note that, while this measure can be regarded as being measured in METs mins (the units of the measure used in Surveys 2 and 3, see previous section, Index Number EXER-016), the cut points for the categories are different from those used in Surveys 2 and 3 because a uniform duration of 20 minutes is assumed for each reported activity session. Accordingly the cut-points are based on 20 minutes duration of exercise.

The resulting physical activity scores were categorized as shown below.

Code	Cut points	Category - Rationale
1	0-<80	None <i>A score of 80 is equivalent to one x 20 minute session of exercise per week, at a less vigorous intensity (4 MET).</i>
2	80-<400	Low <i>A score of 400 is equivalent to five x 20 minute sessions (100 minutes) of less vigorous intensity (4 MET).</i>
3	400-<560	Moderate <i>A score of 560 is equivalent to seven x 20 minute sessions (140 minutes) of exercise at a less vigorous intensity (4 MET).</i>
4	≥560	High

Table 1 Number and percent for revised physical activity at Survey 1, compared with various measures at Surveys 1, 2 & 3

PA Measure at Survey 1:	Original	Revised		Unmodified		Alternate Revised ^a
	Survey 1	Survey 1		Survey 2	Survey 3	Survey 1
	Percent	Number	Percent	Percent	Percent	Percent
<i>Younger</i>	(n=14 779)	(n=14 779)		(n=9 600)		
None	15.2	1 017	6.9	10.5		
Low	28.9	5 452	37.2	34.4		
Moderate	25.7	1 907	13.0	23.3		
High	30.2	6 291	42.9	31.7		
Total Classified	100.0	14 667	100.0	99.9		
<i>Missing</i>	168	112		168		
<i>Mid-age</i>	(n=14 099)	(n=14 099)		(n=11 648)	(n=11 196)	(n=14 099)
None	27.7	1 777	12.7	18.2	18.7	12.7
Low	30.6	6 370	45.6	30.7	36.5	45.6
Moderate	25.4	1 880	13.5	22.1	20.3	29.7
High	16.4	3 955	28.3	28.9	24.5	12.0
Total Classified	100.0	13 982	100.0	99.9	100.0	100.0
<i>Missing</i>	0.8	117	0.8	3.8	4.9	0.8
<i>Older</i>	(n=12 940)	(n=12 940)		(n=9 501)		
None	29.8	2 425	19.5	33.2		
Low	28.5	4 827	38.8	29.4		
Moderate	29.4	1 786	14.4	16.3		
High	12.3	3 405	27.4	21.0		
Total Classified	100.0	12 443	100.1	99.9		
<i>Missing</i>	3.8	4 977	3.8	443		

^a Alternate revision of the PA calculation based on exercise duration of 30 minutes



A score of 400 is equivalent to the current national PA guidelines of 5 bouts of less vigorous (moderate) activity per week. Because a duration of 20 minutes is assumed, a score of 400 METs mins (based on 5 sessions) is thought to be equivalent to a score of 600 METs mins at surveys 2 and 3 (i.e. 5x30 minutes = 150mins x4 METs = 600 METs mins). In both cases this is equivalent to the five sessions recommended in the US Surgeon General's report.²

The distributions of the revised PA variables and the original Survey 1 measure (ExStat) are compared in Table 1. The distribution of PA scores at Surveys 2 and 3 are also shown for the cohorts for which they are available.

Sensitivity to the assumed duration of 20 minutes

The revised measure was re-calculated using an assumption of 30 minutes duration for each activity session, with the cut points for this variable the same as the cut points used for Surveys 2 and 3, in order to evaluate whether or not this explained the differing distribution of PA at Survey 1 compared with Surveys 2 and 3 (Table 1). Varying this assumption made little change to the percent in the 'none' and 'low' categories, increased the percentage in the 'moderate' category and decreased the percentage in the 'high' category.

Sensitivity to differences in group size

Analysis was restricted to women from the Mid-age cohort with PA measures available at all 3 surveys (Table 1). This group showed the same patterns in relation to both estimates of duration and in relation to across-survey comparisons.

Table 2 Percent for both revised physical activity measures at Survey 1, based on both 20 and 30 minutes duration of activity, and measures at Survey 2 and 3 among 9 575 Mid-age women categorised at all 3 surveys

PA categories	Survey 1 (30min)	Survey 1 (20 min)	Survey 2	Survey 3
None	10.7	10.7	17.5	18.1
Low	46.5	46.5	30.7	36.4
Moderate	31.0	14.3	22.4	20.7
High	11.9	28.6	29.4	24.8



The SAS code defining the revised PA variable at surveys 1:

```
/*assign each response to EX1 and EX2 a weighted value equal
to the mid point of the frequency of exercise per week*/;
if EX1 = . then EX1wt = .;
else if EX1 = 1 then EX1wt = 0;
else if EX1 = 2 then EX1wt = 1;
else if EX1 = 3 then EX1wt = 2.5;
else if EX1 = 4 then EX1wt = 5;
else if EX1 = 5 then EX1wt = 7;
else if EX1 = 6 then EX1wt = 10;

if EX2 = . then EX2wt= . ;
else if EX2 = 1 then EX2wt = 0;
else if EX2 = 2 then EX2wt = 1;
else if EX2 = 3 then EX2wt = 2.5;
else if EX2 = 4 then EX2wt = 5;
else if EX2 = 5 then EX2wt = 7;
else if EX2 = 6 then EX2wt = 10;

RevExStat = (EX1wt*20*7.5) + (EX2wt*20*4);

/*Categorize revised survey one exercise status into four groups
1= None
2= Low
3= Moderate
4= High */;

if RevExStat = . then RevPAGrp = .;
else if RevExStat<80 then RevPAGrp = 1;
else if 80<=RevExStat<400 then RevPAGrp = 2;
else if 400<=RevExStat<560 then RevPAGrp = 3;
else if RevExStat>=560 then RevPAGrp = 4;
```

References

1. Brown WJ, Bauman A. Comparison of estimates of population levels of physical activity using two measures. *Australian and New Zealand Journal of Public Health* 2000;24:520-525
2. U.S. Department of Health and Human Services. *Physical activity and health: A report of the Surgeon General*. Washington, DC.; 1996

Health-Related Quality of Life

Physical Functioning

Age Cohorts	Older
Surveys	2 & 3
Derived Variable	MOSMobGrp1
Definition	General mobility
Source Items (Index numbers)	PHMOB1 & PHMOB2 (FAMF-096 & PHYS-002)
Statistical form	Categorical variable
Derived Variable	MOSMobGrp2
Definition	Mobility in relation to public transport
Source Items (Index numbers)	PHMOB3a or PHMOB3b (FAMF-097 or FAMF-166)
Statistical form	Categorical variable
Item (Index number)	PHSAT1 (PHYS-001)
Definition	Satisfaction with physical functioning
Statistical form	Categorical variable
Prepared by	Anne Russell
Endorsed	18 August 2004

Recommendation for usage

At the time of preparation for the 4th Survey of the Older cohort of the ALSWH, the decision was taken to discontinue the use of the supplementary measures of physical functioning from the Medical Outcomes Study as the measures were not considered to provide an adequate measure of mobility (as had been originally intended).



Background

The Medical Outcomes Study (MOS) developed a number of measures of physical functioning¹: the standard SF-36 physical functioning score, a measure of mobility and a measure of satisfaction with physical functioning. The SF-36 physical functioning score (PH, Section 2.6)) has been included in surveys of all age cohorts since the first survey. The additional mobility and satisfaction items were added to the full versions of surveys 2 and 3 of the older cohort only.

Mobility 1

Source Items

PHMOB1 When you travel around your town, does someone have to assist you because of your health?

Code	Response
1	Yes, all of the time
2	Yes, most of the time
3	Yes, some of the time
4	Yes, occasionally
5	No, never

PHMOB2 Are you in bed or in a chair *most* or *all* of the day because of your health?

Code	Response
1	Yes, every day
2	Yes, most days
3	Yes, some days
4	Yes, occasionally
5	No, never

MOS Recommendation

The MOS recommended PHMOB1 and PHMOB2 be summed.

Derived Variable

Item Responses

The distributions of PHMOB1 and PHMOB2 are shown in Table 1

Categorisation

The recommended measure for mobility is the sum of items PHMOB1 and PHMOB2, with no imputation of missing items. The summed mobility score (Table 2) is clearly not normally distributed, with 73% and 62% of women reporting the maximum score at surveys 2 and 3 respectively. Scores have been provisionally categorised in terms of the item response scales as: most or all of the time (1-4); some of the time (5 & 6); occasionally (7&8); never (9 & 10) (Table 1).

Table 1 Number and percent for mobility items and summed score

	Survey 2 (n = 9 514)		Survey 3 (n = 8 646)	
	Number	Percent	Number	Percent
Need assistance when you travel around town				
Yes, all of the time	366	3.9	530	6.2
Yes, most of the time	199	2.1	238	2.8
Yes, some of the time	333	3.5	396	4.6
Yes, occasionally	770	8.2	789	9.2
No, never	7 757	82.3	6 615	77.2
Total classified	9 425		8 568	
<i>Missing</i>	89	0.9	78	0.9
In bed or in a chair <i>most or all</i> of the day				
Yes, every day	120	1.3	232	2.7
Yes, most days	114	1.2	251	2.9
Yes, some days	242	2.6	470	5.5
Yes, occasionally	1 309	13.9	1 654	19.3
No, never	7 620	81.0	5 952	69.5
Total classified	9 405		8 559	
<i>Missing</i>	109	1.2	87	1.0
Summed Mobility Score				
2	75	0.8	148	1.7
3	51	0.6	98	1.2
4	64	0.7	147	1.7
5	142	1.5	203	2.4
6	261	2.8	267	3.1
7	247	2.7	354	4.2
8	480	5.2	627	7.4
9	1 209	13.0	1 400	16.5
10	6 796	72.9	5 247	61.8
Total classified	9 325		8 491	
<i>Missing</i>	189	2.0	155	1.8
Categories for mobility:				
Most or all of the time	190	2.0	393	4.6
Some of the time	403	4.3	470	5.5
Occasionally	727	7.8	981	11.6
Never	8 005	85.8	6 647	78.3

Construct Validity

It was hypothesised that impairment in mobility would be negatively associated with physical activity and positively associated with the number of visits to a general practitioner. Data from both surveys supports these proposed associations (Table 2).

Table 2 Distribution (percent) of physical activity and general practitioner (GP) visits within each category of mobility impairment^a

	Mobility Impaired:			
	Most or all of the time	Some of the time	Occasionally	Never
Physical Activity				
Survey 2				
Nil/sedentary	90.1	70.7	56.9	27.2
Low	6.1	17.3	25.7	31.6
Moderate	2.8	7.6	11.1	17.5
High	1.1	4.3	6.3	23.8
Survey 3				
Nil/sedentary	90.0	75.7	58.8	30.9
Low	7.8	17.6	27.2	29.3
Moderate	1.1	3.8	6.6	17.3
High	1.1	2.9	7.5	22.5
Number of visits to GP				
Survey 2				
None	1.6	0.0	0.8	2.3
1 to 2 visits	1.1	3.6	3.4	14.6
3 to 4 visits	10.6	15.9	14.6	29.8
5 or more visits	86.7	80.6	81.2	53.3
Survey 2				
None	0.8	0.2	0.6	1.5
1 to 2 visits	3.4	3.2	3.5	13.2
3 to 4 visits	11.2	16.0	17.5	30.1
5 or more visits	84.7	80.6	78.4	55.2

^a p-values for chi-square tests are all <0.0001

Change in impairment of mobility over 3 years

Women with mobility scores at both surveys were slightly more mobile at survey 2 than all women with a mobility score at survey 2 (Table 3), indicating some attrition among those less mobile.

The change in mobility impairment between surveys 2 and 3 was calculated as a difference in mobility scores, so that a positive difference represents an increase in mobility and a negative difference represents a decline in mobility. The distribution of these scores is shown in Table 4. The vast majority of women (64.0%, n=4 931) reported no change in mobility between surveys; 27.8% (n=2 138) reported a decline and 8.2% (n=633) reported an improvement.

Table 3 Mobility scores at survey 2 among all older women completing the full survey and among those completing surveys 2 & 3

Mobility at Survey 2	All at Survey 2 (n = 9 514)		Completing Survey 2 & 3 (n = 7 702)	
	Number	Percent	Number	Percent
Most or all of the time	190	2.0	93	1.2
Some of the time	403	4.3	259	3.4
Occasionally	727	7.8	543	7.1
Never	8 005	85.8	6 807	88.4

Table 4 Distributional properties of the change in impairment of mobility scores over 3 years (n = 7 702)

Score	Mean (SD)	Median	Skewness	Range
Change in impairment of mobility	-0.44 (1.37)	0.0	-1.65	-8 to 8

Changes in mobility scores were compared for the 4 categories of mobility at survey 2 (ANOVA, p=0.005) (Table 5). Women impaired most or all of the time at survey 2 reported an increase in score of 0.6, while women impaired occasionally or never reported declines in mobility of a similar level (0.6 and 0.5). Changes among women experiencing impaired mobility either never or occasionally at survey 2 are not statistically distinguishable from one another. All other groups are statistically different from one another.

Table 5 Change in mobility in relation to baseline categories

Mobility Impairment at Survey 2	Change in mobility impairment over 3 years		
	Number	Percent	Mean ^a (95% CI)
Most or all of the time	93	1.2	0.61 (0.34 to 0.89)
Some of the time	259	3.4	0.15 (-0.02 to 0.31)
Occasionally	543	7.1	-0.56 (-0.67 to -0.45)
Never	6 807	88.4	-0.47 (-0.50 to -0.43)
Total	7 702		

^a Means that are not statistically significantly different at 0.005 are joined by a line

Association with SF-36 physical functioning

There was moderate correlation between mobility scores and the SF-36 measure of physical functioning (0.56 at survey 2; 0.61 at survey 3). Also, mean physical functioning scores at each level of impairment were strongly statistically different from one another at both surveys (Table 6).

Table 6 Mean (95% Confidence Interval (CI)) of physical functioning within each category of mobility impairment ^a

SF-36 Physical functioning sub-scale	Mobility Impaired:			
	Most or all of the time	Some of the time	Occasionally	Never
Survey 2	13.7 (10.6-16.9)	28.6 (26.5-30.8)	34.4 (32.8-36.0)	67.5 (67.0-68.0)
Survey 3	12.4 (10.1-14.7)	24.9 (22.8-27.0)	35.5 (34.1-37.0)	66.6 (66.0-67.1)

^a p-values for ANOVA are both <0.0001

The SAS code defining mobility at survey 2 is:

```

if o2survey = 1 and o2q63 ne . and o2q12 ne .
    then o2MOS_Mobility = o2q63 + o2q12 ;
if o2MOS_Mobility ne . then do ;
    if o2MOS_Mobility<=4 then o2MOSMobGrp = 1 ;
    else if o2MOS_Mobility<=6 then o2MOSMobGrp = 2 ;
    else if o2MOS_Mobility<=8 then o2MOSMobGrp = 3 ;
    else if o2MOS_Mobility<=10 then o2MOSMobGrp = 4 ;
end ;
if o2q3 ne . then do ;    if o2q3 >= 3 then o2GPGrp = 3 ;
                        else o2GPGrp = o2q3 ;                end;

```

Mobility 2

Source Items

PHMOB3a Are you able to use public transport? (Survey 2)

PHMOB3b Are you capable of using public transport? (Survey 3)

Code 3a	Code 3b	Response
1	1	No, because of my health
2	2	No, for some other reason
3		Yes, able to use public transportation
	3	Yes
4		Not applicable*
	4	Don't know*

* response category included in ALSWH surveys that was not included in the MOS

MOS Recommendation

The MOS recommended a binary classification of PHMOB3, coded as 'unable to use' and 'all other replies'

Item responses

There were large differences in response distributions at Surveys 1 and 2 (Table 7); possibly due to changes in wording or to subject attrition. Categorisation of these items as recommended by Stewart is shown.

Table 7 Number and percent for public transport item among older women completing the full survey

	Survey 2 (n = 9 514)		Survey 3 (n = 8 646)	
	Number	Percent	Number	Percent
Able to use public transport				
No, because of my health	602	6.4	846	10.0
No, for some other reason	294	3.1	413	4.9
Yes, able to use public transportation	5 830	62.1	6 722	79.2
Not applicable/ Don't know	2 670	28.4	507	6.0
Total classified	9 396		8 488	
<i>Missing</i>	118	1.2	158	1.8
Categorisation as per Stewart¹				
- no exclusions				
No, because of my health	602	6.4	846	10.0
All other replies	8 794	93.6	7 642	90.0
- excluding Not applicable & Don't know				
No, because of my health	602	9.0	846	10.6
All other replies	6 124	91.0	7 135	89.4
Total classified	6 726		7 981	
<i>Missing</i>	2 788	29.3	665	7.7

Satisfaction with physical functioning

Source Item

PHSAT1 How satisfied are you with your physical ability to do what you want to do?

Code	Response
1	Completely satisfied
2	Very satisfied
3	Somewhat satisfied
4	Somewhat dissatisfied
5	Very dissatisfied
6	Completely dissatisfied

MOS Recommendation

Stewart¹ recommends this item be transformed to a scale from 0-to-100.

Item responses

Responses at survey 2 and 3 are shown in Table 8.

Table 8 Number and percent for categories of satisfaction with physical functioning at Surveys 2 and 3 among older women completing the full survey

	Survey 2 (n = 9 514)		Survey 3 (n = 8 646)	
	Number	Percent	Number	Percent
Completely satisfied	1 616	17.2	922	10.8
Very satisfied	3 164	33.7	2 194	25.6
Somewhat satisfied	2 925	31.1	2 955	34.5
Somewhat dissatisfied	1 121	11.9	1 588	18.5
Very dissatisfied	419	4.5	658	7.7
Completely dissatisfied	148	1.6	250	2.9
Total classified	9 393		8 567	
<i>Missing</i>	121	1.3	79	0.9

Reference

1. Anita Stewart (1992) page 76. Physical Disability and Handicap in Measuring Physical Health. A Guide to Rating Scales and Questionnaires. Ian McDowell and Claire Newell (2nd Edition)

Psychosocial

The Inventory of Psychosocial Balance

Sandra Bell

Recommendation for usage

The abbreviated Inventory of Psychosocial Balance (IPB) used at Survey 2 of the ALSWH does not appear to be analogous to the full IPB. Although the abbreviated IPB shows some capacity to distinguish older participants (who should have resolved more of the psychosocial crises) from Younger participants the evidence for consistency with Erikson's¹ theoretical model is weak. Any analyses using these items as a measure of psychosocial development should be interpreted with extreme caution.

Background

This theory of psychosocial development was developed by Erikson¹ following on from Freud's concentration on the psychosocial domain of human development (as opposed to biological or cognitive development). However, Erikson placed more emphasis on social influences and psychological strengths obtained through the resolution of dilemmas than on psychosexual influences.^{2,3} Erikson proposed that each stage and associated psychosocial crises came to the forefront due to biological and social factors, and it was through the resolution of these crises that successful development would be achieved. Erikson proposed eight stages, with approximate ages of occurrence, crises, and the potential strengths to be gained through successful resolution (Table 1).

Table 1 Erikson's psychosocial model of human development^a

Approximate Age	Stage	Psychological Crises	Potential Strength
0-1 years	I. Early infancy	Basic trust versus mistrust	Hope
2-3 years	II. Later infancy	Autonomy versus shame and doubt	Will
4-5 years	III. Early childhood	Initiative versus guilt	Purpose
6-12 years	IV. Middle childhood	Industry versus inferiority	Competence
13-18 years	V. Adolescence	Identity versus role confusion	Fidelity
19-25 years	VI. Early adulthood	Intimacy versus isolation	Love
25-65 years	VII. Middle adulthood	Generativity versus self-absorption and stagnation	Care
65 years or more	VIII. Late adulthood	Ego integrity versus despair	Wisdom

^a Domino & Affonso⁴; Erikson¹; Erikson (1980) cited in Bee²

The Inventory of Psychosocial Balance (IPB) was developed by Domino & Affonso⁴ to assess the resolution of these eight psychosocial crises. The original IPB has 120 items which made this scale inappropriate for inclusion in the main surveys of the ALSWH. However, 2 representative items of each sub-scale were included, reducing the length to 16 items (Table 2). Scoring is shown below, with scoring reversed for three negatively phrased items (c, l, and n).

	Negative	
Score	Item Score	Response
1	4	Never
2	3	Rarely
3	2	Sometimes
4	1	Often

It was hoped that the abbreviated version would be able to distinguish those who had successfully resolved the psychosocial crises and thus had successfully developed. The abbreviated version of the IPB was included in the second survey of the Younger and Older cohorts.

Item responses

The 9 683 participants from the Younger cohort who responded were aged between 22 and 27 (mean=24.7, SD=1.5); 10 421 older participants were aged between 73 and 78. According to Erikson’s model, the Younger cohort is in the early adulthood stage and dealing with crisis of intimacy and isolation. The Older cohort is in the late adulthood stage dealing with the crisis of ego integrity and despair.

Table 2 shows the distribution of responses to the 16 items selected from the IPB. Generally, for both age cohorts, the frequency of response increases from ‘never’ to ‘often’. The responses for 4 items from both the Younger and Older cohorts do not follow this pattern. For both age groups, the frequency peak for item f (developing solutions to a problem) is at ‘sometimes’ rather than ‘often’. With respect to religious beliefs (item e), older women reported a higher frequency for ‘never’ than ‘rarely’ although ‘often’ is still the modal response.; ‘never’ was the modal response for Younger women, which would suggest that the majority of them have not begun to deal with this crisis. Amongst the younger women, items c (wonder who I am) and l (feel lonely even with others around) have a modal response of ‘rarely’ (‘sometimes’ before reversal). Amongst the older women, item f (developing solutions to a problem) has the frequency peak at ‘sometimes’ rather than ‘often’ and item n has a modal response of ‘rarely’.



Table 2 Distribution of Selected IPB items among the Younger and Older cohorts at Survey 2

Please indicate how often each of these statements apply to you:		Younger				Older			
		Never	Rarely	Sometimes	Often	Never	Rarely	Sometimes	Often
<i>Stage I</i>									
a	I can usually depend on others	2.6	11.7	40.9	44.8	2.7	6.9	31.0	59.4
i	Most conflicts between people can be resolved by discussion	0.4	3.0	44.8	51.8	0.5	2.7	44.8	52.1
<i>Stage II</i>									
b	I am a very organised person	0.7	6.0	40.4	52.9	1.1	3.9	36.2	58.8
j	I am quite self-sufficient	0.4	3.1	35.0	61.4	0.9	2.0	26.4	70.7
<i>Stage III</i>									
f	When faced with a problem, I am very good at developing various solutions	0.9	8.6	57.4	33.2	1.6	6.2	52.6	39.6
n	I prefer a job ^b that requires little initiative ^a	15.9	21.3	29.9	33.0	20.8	40.2	18.0	20.9
<i>Stage IV</i>									
g	When faced with a task, I like to apply myself fully	0.3	3.0	40.6	56.2	0.7	1.5	24.4	73.5
o	I genuinely enjoy work ^b	1.0	6.3	45.1	47.6	2.1	3.1	31.2	63.6
<i>Stage V</i>									
c	Sometimes I wonder who I really am ^a	11.8	35.4	30.4	22.4	3.0	10.1	14.9	72.0
k	In general, I know what I want out of life	1.8	12.4	42.2	43.5	0.4	2.0	24.6	73.1

Continued over page

Please indicate how often each of these statements apply to you:		Younger				Older			
		Never	Rarely	Sometimes	Often	Never	Rarely	Sometimes	Often
Stage VI									
d	I have experienced some very close friendships	1.0	10.1	38.3	50.6	2.6	6.3	31.4	59.8
l	I often feel lonely even when there are others around me ^a	11.7	37.1	34.3	16.8	6.6	23.9	29.8	39.7
Stage VII									
h	I derive great pleasure in watching a child master a new skill	6.0	12.1	26.8	55.1	1.7	4.6	18.6	75.1
p	Planning for future generations is very important	1.6	6.8	30.9	60.9	2.4	3.1	20.8	73.7
Stage VIII									
e	My religious or spiritual beliefs are stronger now than they have ever been	41.8	25.8	19.4	13.0	18.5	14.1	28.1	39.3
m	Life has been good to me	1.0	7.0	40.3	51.8	0.7	1.9	24.5	72.9

^a items reversed

^b 'Job' and 'work' may refer to paid or unpaid work, volunteer work, or any other task or chore which occupies your time.

Scores

For participants who answered all 16 items, a score for each stage were derived as the mean of the two items representing that stage. Scores for each stage have the theoretical range of 2 to 8. Table 3 shows the mean and standard deviation for these 8 scores as well as the Pearson correlation between the 2 items representing each stage.

Amongst the Younger cohort, the highest means are for the first four stages and stage VII. The highest correlations are for stage V and VII indicating these are the most coherently assessed stages; stage I, III, and VIII have items that are almost unrelated. For the older women, the stage with the lowest mean also has the lowest correlation, which suggests that one item may be pulling down the mean. The highest correlations are for stage II, IV and VII indicating these are the most coherently assessed stages; stages I, II, VI and VIII have items that are almost unrelated.

Table 3 Mean (Standard Deviation) and Correlations for IPB sub scales

Stage	Items	Mean (SD)		Correlation ^a	
		Younger (n = 8 897)	Older (n = 7 559)	Younger (n = 8 897)	Older (n = 7 559)
I	a and i	6.8 (1.0)	7.0 (1.0)	0.13	0.11
II	b and j	7.0 (1.0)	7.2 (1.0)	0.23	0.30
III	f and n	6.0 (1.3)	5.7 (1.3)	0.07	0.07
IV	g and o	6.9 (1.0)	7.3 (1.0)	0.28	0.35
V	c and k	5.9 (1.4)	7.3 (1.0)	0.38	0.18
VI	d and l	5.9 (1.3)	6.5 (1.2)	0.22	0.09
VII	h and p	6.8 (1.3)	7.3 (1.0)	0.32	0.30
VIII	e and m	5.5 (1.3)	6.6 (1.3)	0.09	0.12

^a All correlations were significant at $p < 0.001$

Data for the full IPB (taken from Table 6 of Domino and Affonso⁴) were compared with ALSWH data from selected IPB items for participants who completing all 16 items. Because mean scores from the 2 samples were based on very different number of items (ALSWH: 2 items per score; Domino and Affonso: 15 items per score) the order of means from highest to lowest was used to compare the sample means (Table 4). The two samples produce very different orders of means. The resolution of a stage should lead to a higher mean score; hence the earlier stages would be expected to have higher means than the later. This is not the case for either sample of younger adults. For this older sample, who according to Erikson's theory should have resolved the crises associated with stages I to VII, stage VIII should have the lowest mean. This is not the case for either sample of older adults.

Table 4 Stage Means from ALSWH and Domino and Affonso

Stage	ALSWH Younger (n = 8 897)		Domino & Affonso (n = 45)		ALSWH Older (n = 7 559)		Domino & Affonso (n = 45)	
	22-27 years		20-25 years		73-78 years		65--70 years	
	Mean	Rank ^a	Mean	Rank ^a	Mean	Rank ^a	Mean	Rank ^a
I	6.8	3	57.8	3	7.0	5	56.6	4
II	7.0	1	52.1	8	7.2	4	55.8	6
III	6.0	5	53.2	6	5.7	8	50.1	8
IV	6.9	2	55.6	4	7.3	1	53.1	7
V	5.9	6	53.1	7	7.3	1	56.9	3
VI	5.9	6	59.5	1	6.5	7	56.3	5
VII	6.8	3	58.6	2	7.3	1	62.5	1
VIII	5.5	8	54.1	5	6.6	6	58.6	2

^a Rank -highest to lowest

Domino & Affonso⁴ assessed how well the IPB measured the resolution of Erikson's psychosocial stages by examining the expected number of significant correlations. The mean score for each stage was correlated with the mean score for every other stage and postulates were made regarding how many significant correlations should be observed. For their young adult sample the first 5 scales of trust, autonomy, initiative, industry and identity should inter-correlate and therefore the 10 correlations between stages I to V should be significant (from 28 possible correlations). For their older adult sample it was postulated that all subscales should be correlated. Table 5 compares the results in the two samples.

For the younger ALSWH sample, the range of correlations for the "resolved" stages (I to V) was 0.14 to 0.38, and for the unresolved stages (VI to VIII) was 0.08 to 0.44. The highest correlation was 0.44 between Stages V and VI which the younger sample should not yet have reached. For the Older 2 sample, the range of correlations was 0.08 to 0.42.

Table 5 Stage inter-correlations for ALSWH and the Domino & Affonso sample

	ALSWH Younger	Domino & Affonso: Young Adults	ALSWH Older	Domino & Affonso: Elderly
Expected Correlations	10	10	28	28
Significant Correlations	9 ^a	10	19 ^a	26
Resolved Median r	0.23	0.46	0.17	0.52
Unresolved Median r	0.18	0.41		Not reported

^a A cut off score of 0.15 was used due to the large sample

Table 6 Results of Factor Analysis^a – Factor loadings and eigenvalues

Item	Stage	Younger				Older			
		Factor 1	Factor 2	Factor 3	Factor 4	Factor 1	Factor 2	Factor 3	Factor 4
<i>Stages represented</i>		<i>II to V</i>	<i>V & VI</i>	<i>I,VI & VIII</i>	<i>VII</i>	<i>II to V</i>	<i>I,VI to VIII</i>	<i>V,VI, &VIII</i>	<i>III</i>
g Apply fully	IV	0.69				0.67			
j Self-sufficient	II	0.64				0.67			
b Organized	II	0.64				0.65			
f Solutions	III	0.60				0.61			
o Enjoy work	IV	0.42				0.53			-0.33
c Who I am	V		0.82					0.69	
l Lonely	VI		0.75					0.73	
k Know what want	V	0.45	0.45			0.57			
a Depend on others	I			0.67			0.53	0.33	
d Friendships	VI			0.65			0.53		
m Life been good	VIII		0.37	0.52			0.34	0.45	
i Discussion	I	0.33		0.38			0.48		
e Religious beliefs	VIII			0.38	0.32		0.40		-0.32
h Child master skill	VII				0.80		0.60		
p Future generations	VII				0.75		0.55		
n Little initiative ^a	III								0.88
Eigenvalue		2.31	1.78	1.70	1.48	2.50	1.89	1.50	1.09

^a Items with two factor loadings of more than 0.3 have the highest factor loading bolded.

^b Item n for the Younger cohort had no factor loading over 0.3

A principal component factor analysis with varimax rotation was performed on all 16 items. Results suggest little consistency, either between samples or between data and theory (Table 6).

The factor analyses for both cohorts suggest four distinct factors. The stages represented in the factors indicate some consensus, except that stages V and VI are split across factors. Amongst the older women, the stages represented in each factor also indicate some consensus, except for items from stages V and VI splitting across factors. Item n loads onto a factor on its own. This could be due to the fact that although the question is “I prefer a job that requires little initiative”, it is easy to read this item as “I prefer a job that requires ‘a’ little initiative” thus reversing the direction of the question from negative to positive.

Comparison of Stage Scores for Younger and Older cohorts

T-tests were used to assess differences between the Younger and Older cohorts in means scores for each stage in the Erikson theory. Table 7 indicates that for each stage the means are significantly different; stage 3 is the only stage where scores for the Younger are significantly higher than scores for the Older cohort. Considering the problems with the measurement of this stage this could be disregarded as a problem with item n.

Table 7 Comparison of Younger 2 and Older 2 for the revised IPB subscales

Stage	Mean (SD)		t-statistic	p-value
	Younger	Older		
I	6.8 (1.0)	7.0 (1.0)	-13.53	<0.0001
II	7.0 (1.0)	7.2 (1.0)	-11.95	<0.0001
III	6.0 (1.3)	5.7 (1.3)	17.23	<0.0001
IV	6.9 (1.0)	7.3 (1.0)	-24.49	<0.0001
V	5.9 (1.4)	7.3 (1.0)	-74.53	<0.0001
VI	5.9 (1.3)	6.5 (1.2)	-30.58	<0.0001
VII	6.8 (1.3)	7.3 (1.0)	-29.67	<0.0001
VIII	5.5 (1.3)	6.6 (1.3)	-57.86	<0.0001

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1. Erikson EH. *Identity and the life cycle*. New York: Norton; 1959
2. Bee HL. *The Journey of Adulthood*, 3rd ed. New Jersey: Prentice Hall; 1996
3. Berger, KS. *The developing person through the life span*. New York: Worth Publishers; 2000
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Vulnerability to Abuse Screening Scale

Age Cohorts	Younger and Older
Surveys	Younger: 1 & 2; Older: 1, 2 & 3
Derived Variable	VLNRBL
Definition	12-item factor score for vulnerability to abuse/fear of abuse
Derived Variable	EXTNL
Definition	12-item factor score for coercion/unwanted external control
Derived Variable	CONTRL
Definition	12-item factor score for dependence/personal control
Derived Variable	DSTRSS
Definition	12-item factor score for dejection/psychological neglect or distress
Source Items (Index numbers)	VASS_1 to VASS_12 (FAMF-017 to -019, FAMF-021, FAMF-022, FAMF-024, FAMF-034 to FAMF-039)
Statistical form	Continuous variable
Prepared by	Anne Russell and Jenny Powers
Endorsed	19 November 2002

Source Items

Items from the Vulnerability to Abuse Screening Scale (VASS) are based on the 12 items shown on the next page. Ten of the items (a to j) come from the 15-item Hwalek- Sengstock Elder Abuse Screening Test,¹ one (k) from Conflict Tactics Scale² and one (l) from research into abuse in pregnancy³.

These items have appeared on surveys 1, 2 and 3 of the Older cohort and surveys 2 and 3 of the Younger cohort.

These questions are about getting on with other people: *(Mark all that apply)*

VASS_1	a	Are you sad or lonely often?
VASS_2	b	Do you feel uncomfortable with anyone in your family?
VASS_3	c	Can you take your own medication and get around by yourself?
VASS_4	d	Do you feel that nobody wants you around?
VASS_5	e	Does someone in your family make you stay in bed or tell you you're sick when you know you're not?
VASS_6	f	Has anyone forced you to do things you didn't want to do?
VASS_7	g	Has anyone taken things that belong to you without your OK?
VASS_8	h	Do you trust most of the people in your family?
VASS_9	i	Do you have enough privacy at home?
VASS_10	j	Has anyone close to you tried to hurt you or harm you recently?
VASS_11	k	Has anyone close to you called you names or put you down or made you feel bad recently?
VASS_12	l	Are you afraid of anyone in your family?
	m	None of the above

Code	Response
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1	Yes
0	No

Derived Variable

Internal Consistency and Factor Analysis

The validity of these 12 items as basis for 4 sub-scales (vulnerability, dependence, dejection and coercion) has been documented by ALSWH researchers.^{4,5} The items loading most strongly onto the factors are: Dejection (a, b and d), Dependence (c, h and i); Coercion (e, f and g); Vulnerability (j, k and l).

Scores

Sub-scale scores are calculated as the weighted sum of coded responses, where weights are the scoring coefficients from factor analysis.

Interpretation

The dependence and dejection sub-scales are not directly representative of abuse and may not be useful as a screening measure. Dependence relates to the neglect aspect of abuse and measures lack of personal autonomy. Dejection represents depression and social isolation; it may either indicate higher risk of abuse or be an outcome of abuse. The vulnerability and coercion factors have strong face validity as measures of physical and emotional abuse.^{4,5}

The SAS code defining the vulnerability to abuse subscales at Survey 3 is:

```

/*****
*** Elder Abuse subscales using factor score ***
*** coefficients estimated by PROC FACTOR ***
*** o3vlnrbl = personal vulnerability/fear ***
*** o3contrl = personal control ***
*** o3dstrss = psychological neglect/distress ***
*** o3extrnl = unwanted external control ***
*****/
vass1=o3q63a;      vass2=o3q63b;      vass3=o3q63c;      vass4=o3q63d;
vass5=o3q63e;      vass6=o3q63f;      vass7=o3q63g;      vass8=o3q63h;
vass9=o3q63i;      vass10=o3q63j;     vass11=o3q63k;     vass12=o3q63l;

o3vlnrbl =
(- .14906*vass1 + .06198*vass2 - .05228*vass3 - .07518*vass4
- .08877*vass5 + .00214*vass6 - .06690*vass7 - .02065*vass8
+ .01816*vass9 + .48341*vass10 + .39275*vass11 + .51920*vass12 ) ;

o3contrl =
(- .08230*vass1 + .01342*vass2 + .38245*vass3 + .02198*vass4
- .00840*vass5 - .06186*vass6 + .04167*vass7 + .48682*vass8
+ .48876*vass9 + .05317*vass10 - .07881*vass11 - .04952*vass12) ;

o3dstrss =
( .60833*vass1 + .37006*vass2 - .03939*vass3 + .42249*vass4
- .17395*vass5 - .01340*vass6 + .09290*vass7 + .01172*vass8
- .01743*vass9 - .11672*vass10 + .10538*vass11 - .12273*vass12) ;

o3extrnl =
(- .11138*vass1 - .06285*vass2 - .00331*vass3 + .04604*vass4
+ .59639*vass5 + .50937*vass6 + .40477*vass7 - .01741*vass8
- .01126*vass9 - .07179*vass10 - .05860*vass11 - .01734*vass12) ;

```

References

1. Hwalek MA, Sengstock MC. Assessing the probability of abuse of the elderly: Toward development of a clinical screening instrument. *Journal of Applied Gerontology*, 1986;5(2):53-173
2. Straus MA. Measuring intra-family conflict and violence: The Conflict Tactics (CT) Scales. *Journal of Marriage and the Family* 1979;41:75-88
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4. Schofield MJ, Reynolds R, Mishra GD, Powers JR, Dobson AJ. Screening for vulnerability to abuse among older women: Women's Health Australia Study. *Journal of Applied Gerontology* 2002;21(2):24-39
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