

## Supplement 7: Results for three age groups

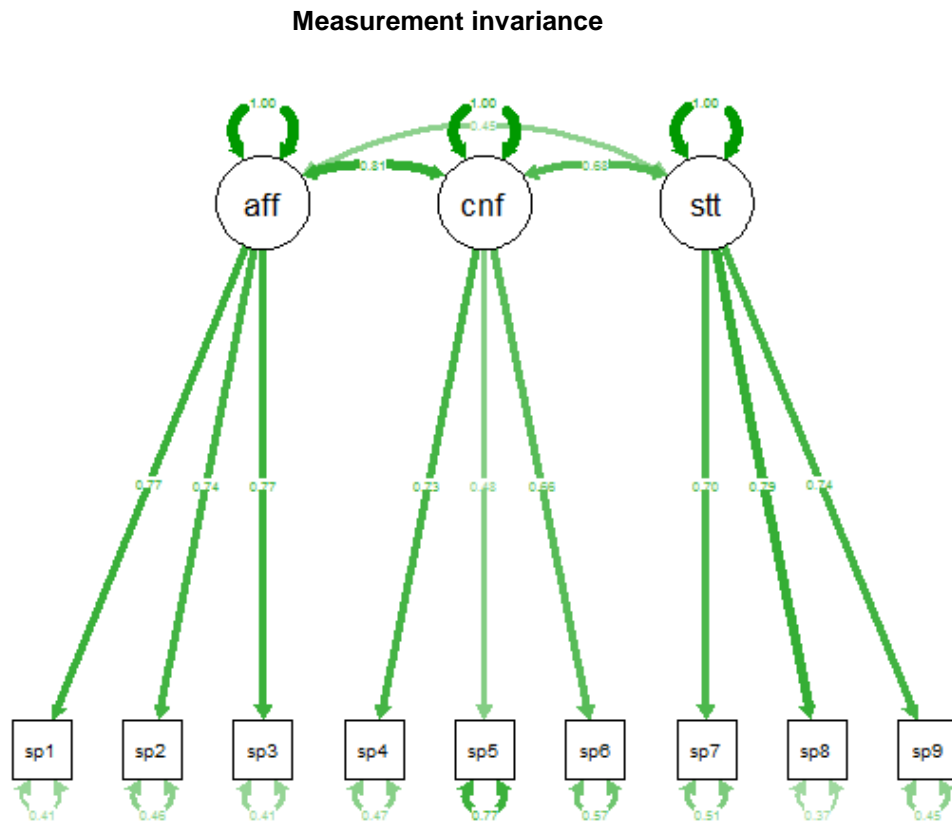


Figure S7.1. A path diagram of Confirmatory Factor Analysis (CFA). Residual variances are fixed to 1.0.

Numbers indicate the standardized parameter estimates as weighted edges.

Table S7.1

Results measurement invariance tests over all age groups

	X2	df	p-value	CFI	ΔCFI	TLI	RMSEA	BIC	AIC
Model 1 – Conf. invar.	573.01	72	<.001	.986		.978	.043	169436	168775
Model 2 <sup>a</sup> – Metric invar.	616.52	84	<.001	.985	.001	.980	.041	169367	168795
Model 3 <sup>b</sup> – Scalar invar.	882.96	96	<.001	.977	.007	.975	.046	169522	169037
Model 4 <sup>c</sup> – Strict invar.	1168.04	102	<.001	.969	.008	.968	.052	169751	169310

<sup>a</sup>Equal loadings; <sup>b</sup>Equal loadings, equal intercepts; <sup>c</sup>Equal loadings, equal intercepts, equal means

## Descriptive statistics

Table S7.2

*Distribution of the social needs per age category*

Age category	N	M age	M affection	M confirmation	M status	M happiness	Percentage men	Percentage higher educated
Young adult	4245	28.51	5.99 <sup>a</sup>	5.71 <sup>a</sup>	3.67 <sup>a</sup>	6.81 <sup>a</sup>	26%	77%
Middle adult	6327	52.30	5.74 <sup>b</sup>	5.88 <sup>b</sup>	3.93 <sup>b</sup>	6.90 <sup>a,b</sup>	35%	76%
Late adult	915	68.70	5.62 <sup>b</sup>	5.89 <sup>a,b</sup>	4.08 <sup>b</sup>	7.11 <sup>b</sup>	53%	72%
<i>Total</i>	<i>11487</i>	<i>44.82</i>	<i>5.82</i>	<i>5.82</i>	<i>3.85</i>	<i>6.88</i>	<i>33%</i>	<i>76%</i>

Categories indicated with the same letter do not differ significantly with p-value < .00008  
(Bonferroni correction = p-value / amount of tests = .001 / 12)

Table S7.3

*Distribution of the social needs per age category (weighted)*

Age category	N	M age	M affection	M confirmation	M status	M happiness	Percentage men	Percentage higher educated
Young adult	4216	28.04	5.70 <sup>a</sup>	5.52 <sup>a</sup>	3.54 <sup>a</sup>	6.50 <sup>a</sup>	48%	31%
Middle adult	6267	51.89	5.47 <sup>b</sup>	5.68 <sup>b</sup>	3.67 <sup>a</sup>	6.68 <sup>b</sup>	50%	25%
Late adult	903	70.06	5.42 <sup>b</sup>	5.71 <sup>a,b</sup>	3.68 <sup>a</sup>	6.96 <sup>c</sup>	51%	50%
<i>Total</i>	<i>11386</i>	<i>46.48</i>	<i>5.54</i>	<i>5.63</i>	<i>3.63</i>	<i>6.66</i>	<i>50%</i>	<i>32%</i>

Categories indicated with the same letter do not differ significantly with p-value < .00008  
(Bonferroni correction = p-value / amount of tests = .001 / 12)

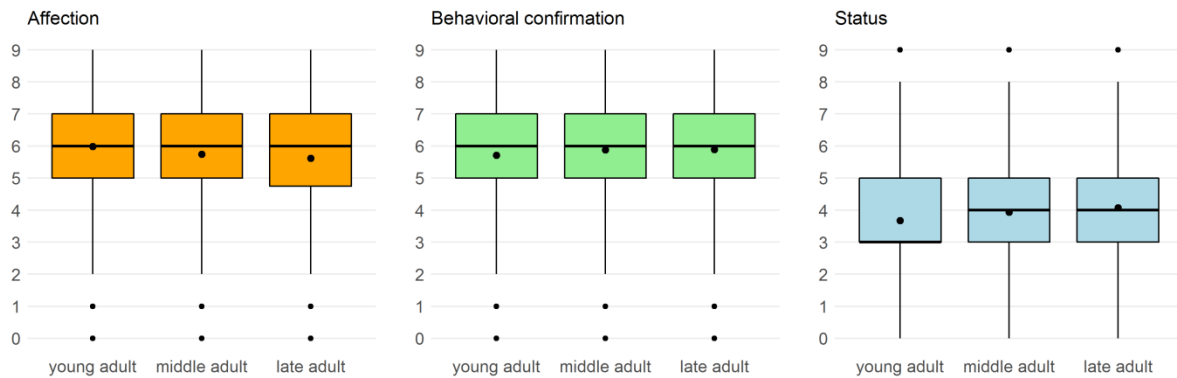


Figure 5. Boxplots of the social needs per age group. The black dots in the middle indicate the means.

### ANOVA results

To examine age group differences in the average levels of social need fulfilment, ANOVA analyses were performed. Our models showed small but significant age group differences in affection ( $F_{(2, 11413)} = 33.13, p < .001$ ), behavioral confirmation ( $F_{(2, 11409)} = 18.05, p < .001$ ), and status ( $F_{(2, 11408)} = 38.42, p < .001$ ; see Supplement 2 for details). These differences were marginal as the maximum difference comprised 0.48 on a 9-point scale. Young adults reported slightly higher fulfilment of affection than middle ( $d = 0.13, M_y = 5.99, M_m = 5.74$ ) and late adults ( $d = 0.20, M_l = 5.62$ ), lower levels of behavioral confirmation than middle adults ( $d = -0.10, M_y = 5.71, M_m = 5.88$ ) and lower levels of status than middle ( $d = -0.14, M_y = 3.67, M_m = 3.93$ ) and late adults ( $d = -0.22, M_l = 4.08$ ).

The weighted ANOVA analyses showed comparable age group differences in social need fulfilment for affection ( $F_{(2, 11312)} = 23.63, p < .001$ ), behavioral confirmation ( $F_{(2, 11308)} = 17.05, p < .001$ ), and status ( $F_{(2, 11307)} = 7.50, p = .001$ ; see Supplement 2 for details). After weighting differences in status fulfilment lost their significance.

## Regression analyses

Table S7.4

*Regression analyses on happiness. Weighted by age, gender and education level (N = 11,386).*

Pred. variable	Model 1		Model 2		Model 3		Model 4	
	<i>b</i>	(SE)	<i>b</i>	(SE)	<i>b</i>	(SE)	<i>b</i>	(SE)
Intercept	6.83***	(0.01)	6.79***	(0.05)	6.66***	(0.02)	6.51***	(0.05)
Affection	0.35***	(0.01)	0.32***	(0.01)	0.36***	(0.02)	0.33***	(0.02)
Confirmation	0.23***	(0.01)	0.21***	(0.01)	0.25***	(0.02)	0.22***	(0.02)
Status	0.13***	(0.01)	0.11***	(0.01)	0.12***	(0.02)	0.11***	(0.02)
Gender (women)			0.03	(0.03)			0.02	(0.03)
Education level			0.12***	(0.02)			0.16***	(0.02)
Affection <sup>2</sup>			-0.03***	(0.00)			-0.03***	(0.00)
Confirmation <sup>2</sup>			-0.03***	(0.00)			-0.03***	(0.00)
Status <sup>2</sup>			-0.02***	(0.00)			-0.02***	(0.00)
Middle adult <sup>1</sup> (n=6267)					0.19***	(0.03)	0.20**	(0.03)
Late adult (n=903)					0.51***	(0.04)	0.55***	(0.04)
Affection * Middle adult					-0.01	(0.02)	-0.01	(0.02)
Affection * Late adult					0.03	(0.03)	0.03	(0.03)
Confirmation * Middle adult					-0.02	(0.03)	-0.01	(0.03)
Confirmation * Late adult					-0.14***	(0.04)	-0.12***	(0.04)
Status * Middle adult					-0.01	(0.02)	-0.02	(0.02)
Status * Late adult					0.05	(0.03)	0.03	(0.03)
R <sup>2</sup> <sub>a</sub>	.30***		.32***		.31***		.33***	

<sup>1</sup>Reference group is emerging adults (n = 4216); \*\*\**p* < .001, \*\**p* < .01, \**p* < .05

<sup>2</sup>Quadratic term

<sub>a</sub>Adjusted R-squared statistic

Table S7.5  
*Regression analyses on happiness (unweighted)*

Pred. variable	Model 1		Model 2		Model 3		Model 4	
	<i>b</i>	(SE)	<i>b</i>	(SE)	<i>b</i>	(SE)	<i>b</i>	(SE)
Intercept	6.88***	(.01)	6.81***	(.07)	6.80***	(.02)	6.72***	(.07)
Affection	.32***	(.01)	.31***	(.01)	.33***	(.01)	.32***	(.01)
Confirmation	.24***	(.01)	.23***	(.01)	.23***	(.02)	.21***	(.02)
Status	.11***	(.01)	.10***	(.01)	.11***	(.01)	.11***	(.01)
Gender (women)			.08**	(.03)			.05	(.03)
Education level			.10***	(.02)			.11***	(.02)
Affection <sup>2</sup>			-.04***	(.00)			-.04***	(.00)
Confirmation <sup>2</sup>			-.03***	(.00)			-.03***	(.00)
Status <sup>2</sup>			-.02***	(.00)			-.02***	(.00)
Middle adult <sup>1</sup> (n=6327)					.10***	(.03)	.09**	(.03)
Late adult (n=915)					.33***	(.05)	.31***	(.05)
Affection * Middle adult					.00	(.02)	-.00	(.02)
Affection * Late adult					-.00	(.04)	-.01	(.04)
Confirmation * Middle adult					.01	(.02)	.02	(.02)
Confirmation * Late adult					-.04	(.05)	-.03	(.04)
Status * Middle adult					-.01	(.02)	-.01	(.02)
Status * Late adult					.01	(.04)	.01	(.04)
R <sup>2</sup> <sub>a</sub>	.31***		.32***		.31***		.33***	

<sup>1</sup>Reference group is young adults (n=4245); \*\*\*p<.001, \*\*p<.01, \*p<.05

### Cluster analyses

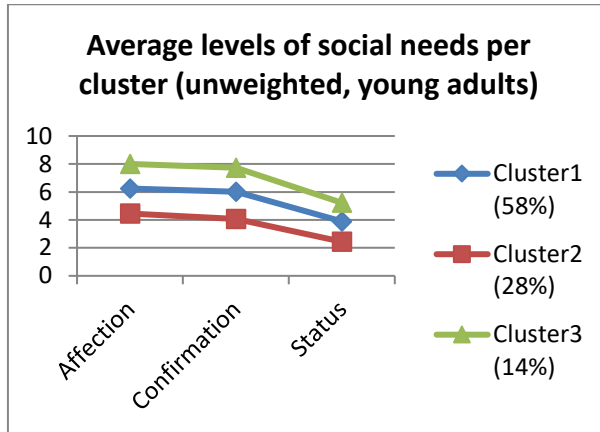


Figure 7.2. Results of cluster analysis in young adults.

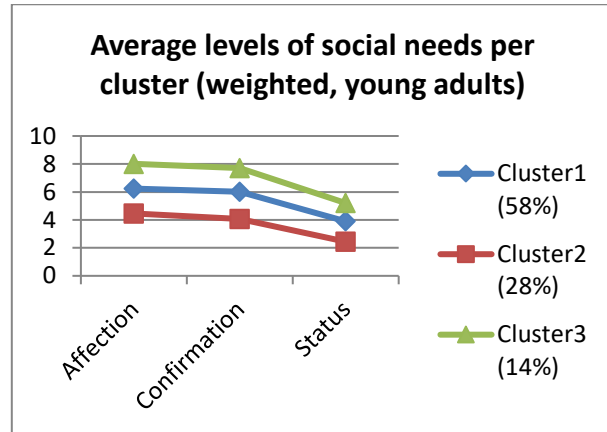


Figure 7.3. Results of weighted cluster analysis in young adults.

Table S7.6

Goodness-of-fit measures of the 10 investigated cluster models with the **three social needs for young adults (unweighted sample, n = 4,245)**

	$N_{par}$	$L^2$	$df$	$p$ -value	LL	BIC (LL)	Class.Err
One-cluster model	27	3499	972	<.001	-23552	47329	0
Two-cluster model	31	1515	968	<.001	-22560	45378	.09
<b>Three-cluster model</b>	<b>35</b>	<b>936</b>	<b>964</b>	<b>.74</b>	<b>-22270</b>	<b>44833</b>	<b>.12</b>
Four-cluster model	39	767	960	1	-22186	44697	.14
Five-cluster model	43	710	956	1	-22157	44673	.21
Six-cluster model	47	679	952	1	-22142	44676	.21
Seven-cluster model	51	658	948	1	-22131	44688	.26
Eight-cluster model	55	646	944	1	-22125	44709	.27
Nine-cluster model	59	634	940	1	-22119	44731	.32
Ten-cluster model	63	624	936	1	-22114	44754	.33

Table S7.7

Goodness-of-fit measures of the 10 investigated cluster models with the **three social needs for young adults (weighted sample, n = 4,216)**

	$N_{par}$	$L^2$	$df$	$p$ -value	LL	BIC (LL)	Class.Err
One-cluster model	27	3464	972	<.001	-23361	46947	0
Two-cluster model	31	1491	968	<.001	-22375	45008	.09
<b>Three-cluster model</b>	<b>35</b>	<b>918</b>	<b>964</b>	<b>.85</b>	<b>-22088</b>	<b>44468</b>	<b>.12</b>
Four-cluster model	39	758	960	1	-22008	44341	.14
Five-cluster model	43	701	956	1	-21980	44318	.21
Six-cluster model	47	670	952	1	-21964	44321	.21
Seven-cluster model	51	650	948	1	-21954	44334	.27
Eight-cluster model	55	640	944	1	-21949	44358	.27
Nine-cluster model	59	625	940	1	-21942	44375	.32
Ten-cluster model	63	616	936	1	-21937	44400	.32

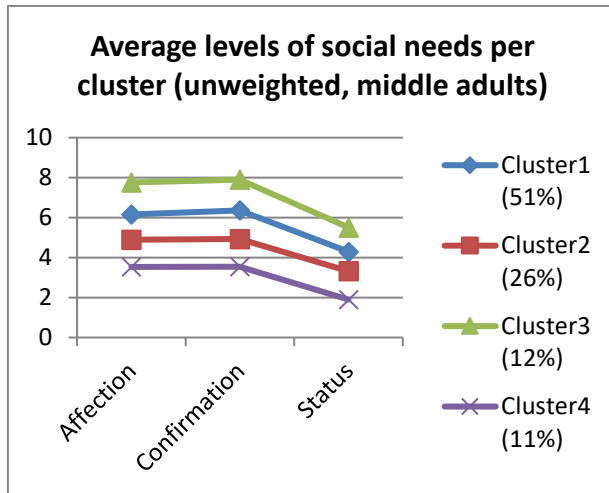


Figure 7.4. Results of cluster analysis in middle adults.

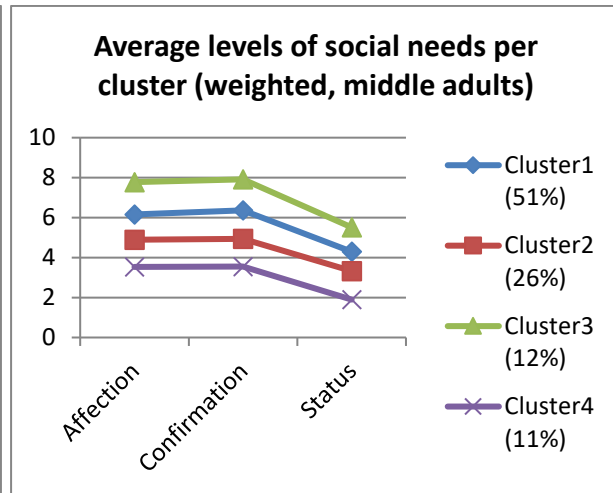


Figure 7.5. Results of weighted cluster analysis in middle adults.

Table S7.8

Goodness-of-fit measures of the 10 investigated cluster models with the **three social needs for middle adults (unweighted sample, n = 6,327)**

	$N_{par}$	$L^2$	$df$	$p$ -value	LL	BIC (LL)	Class.Err
One-cluster model	27	5421	972	<.001	-34465	69167	0
Two-cluster model	31	1995	968	<.001	-32752	65776	.07
Three-cluster model	35	1087	964	.00	-32298	64902	.12
<b>Four-cluster model</b>	<b>39</b>	<b>799</b>	<b>960</b>	<b>1</b>	<b>-32155</b>	<b>64650</b>	<b>.14</b>
Five-cluster model	43	733	956	1	-32121	64619	.15
Six-cluster model	47	697	952	1	-32103	64618	.18
Seven-cluster model	51	666	948	1	-32088	64621	.19
Eight-cluster model	55	655	944	1	-32082	64646	.21
Nine-cluster model	59	662	940	1	-32086	64688	.35
Ten-cluster model	63	613	936	1	-32061	64674	.31

Table S7.9

Goodness-of-fit measures of the 10 investigated cluster models with the **three social needs for middle adults (weighted sample, n = 6,267)**

	$N_{par}$	$L^2$	$df$	$p$ -value	LL	BIC (LL)	Class.Err
One-cluster model	27	5371	972	<.001	-34138	68511	0
Two-cluster model	31	1983	968	<.001	-32443	65158	.07
Three-cluster model	35	1076	964	.01	-31990	64286	.12
<b>Four-cluster model</b>	<b>39</b>	<b>791</b>	<b>960</b>	<b>1</b>	<b>-31847</b>	<b>64035</b>	<b>.14</b>
Five-cluster model	43	755	956	1	-31829	64035	.18
Six-cluster model	47	690	952	1	-31797	64005	.18
Seven-cluster model	51	672	948	1	-31788	64022	.17
Eight-cluster model	55	644	944	1	-31774	64029	.21
Nine-cluster model	59	635	940	1	-31769	64054	.24
Ten-cluster model	63	621	936	1	-31763	64076	.26

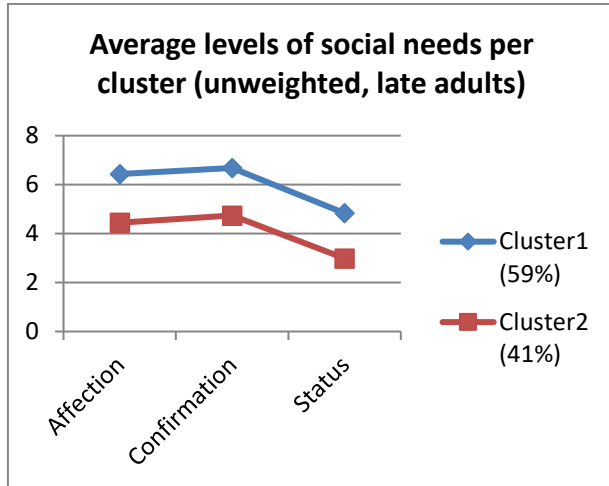


Figure 7.7. Results of cluster analysis in late adults.

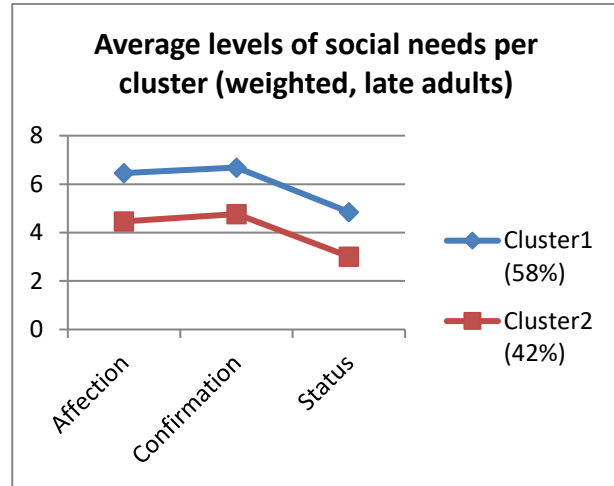


Figure 7.7. Results of weighted cluster analysis in late adults.

Table S7.10

Goodness-of-fit measures of the 10 investigated cluster models with the **three social needs for late adults (unweighted sample, n = 915)**

	$N_{\text{par}}$	$L^2$	$df$	$p$ -value	LL	BIC (LL)	Class.Err
One-cluster model	27	1039	884	<.001	-4985	10154	0
<b>Two-cluster model</b>	<b>31</b>	<b>556</b>	<b>880</b>	<b>1</b>	<b>-4743</b>	<b>9698</b>	<b>.10</b>
Three-cluster model	35	423	876	1	-4677	9592	.14
Four-cluster model	39	377	872	1	-4654	9573	.15
Five-cluster model	43	367	868	1	-4649	9591	.27
Six-cluster model	47	354	864	1	-4643	9605	.23
Seven-cluster model	51	345	860	1	-4638	9623	.23
Eight-cluster model	55	340	856	1	-4635	9645	.23
Nine-cluster model	59	334	852	1	-4633	9667	.30
Ten-cluster model	63	329	848	1	-4630	9689	.27

Table S7.11

Goodness-of-fit measures of the 10 investigated cluster models with the **three social needs for late adults (weighted sample, n = 903)**

	$N_{\text{par}}$	$L^2$	$df$	$p$ -value	LL	BIC (LL)	Class.Err
One-cluster model	27	1025	872	<.001	-4916	10016	0
<b>Two-cluster model</b>	<b>31</b>	<b>552</b>	<b>868</b>	<b>1</b>	<b>-4680</b>	<b>9571</b>	<b>.10</b>
Three-cluster model	35	419	864	1	-4613	9465	.13
Four-cluster model	39	374	860	1	-4590	9446	.14
Five-cluster model	43	363	856	1	-4585	9463	.27
Six-cluster model	47	353	852	1	-4580	9480	.25
Seven-cluster model	51	344	848	1	-4576	9498	.24
Eight-cluster model	55	336	844	1	-4572	9517	.24
Nine-cluster model	59	337	840	1	-4572	9545	.35
Ten-cluster model	63	333	836	1	-4570	9569	.33



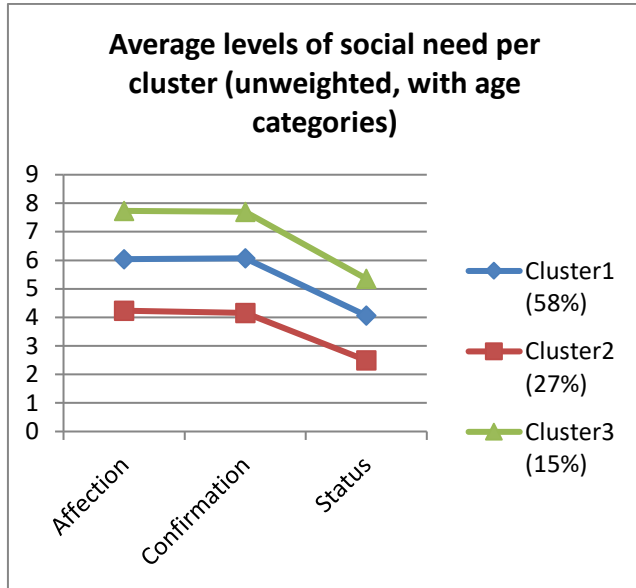


Figure 7.8. Results of cluster analysis with age categories in total sample.

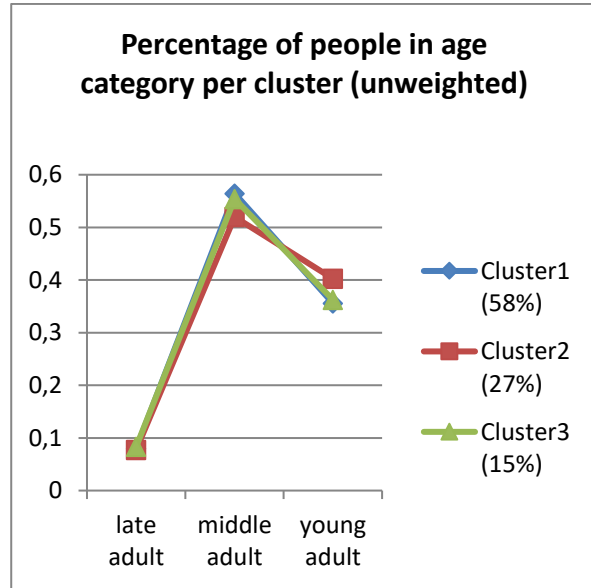


Figure 7.9. Results of cluster analysis with age categories in total sample.

Table S7.12

Goodness-of-fit measures of the 10 investigated cluster models with the **three social needs and the three age categories (unweighted sample, n = 11,471)**

	$N_{par}$	$L^2$	$df$	$p$ -value	LL	BIC (LL)	Class.Err
One-cluster model	29	10249	2970	<.001	-73394	147058	0
Two-cluster model	35	4456	2964	<.001	-70497	141320	.08
<b>Three-cluster model</b>	<b>41</b>	<b>2881</b>	<b>2958</b>	<b>.84</b>	<b>-69709</b>	<b>139802</b>	<b>.12</b>
Four-cluster model	47	2426	2952	1	-69482	139403	.15
Five-cluster model	53	2232	2946	1	-69385	139264	.24
Six-cluster model	59	2141	2940	1	-69339	139230	.27
Seven-cluster model	65	2023	2934	1	-69280	139168	.29
Eight-cluster model	71	1951	2928	1	-69244	139152	.31
Nine-cluster model	77	1877	2922	1	-69207	139134	.31
Ten-cluster model	83	1854	2916	1	-69196	139167	.34

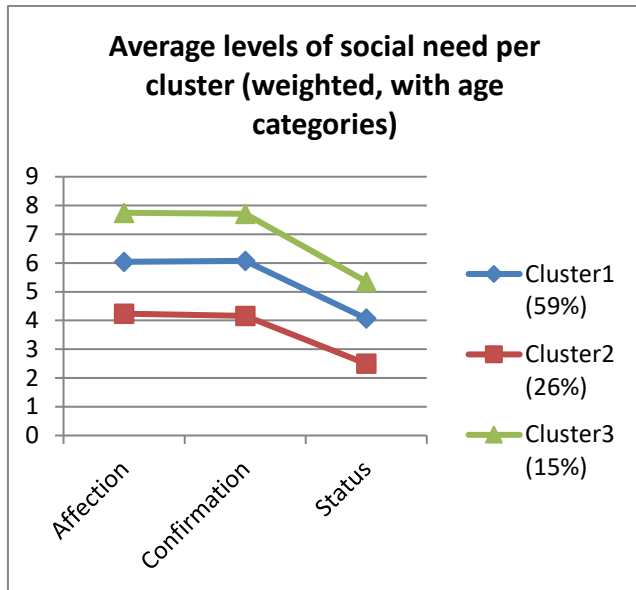


Figure 7.10. Results of weighted cluster analysis with age categories in total sample.

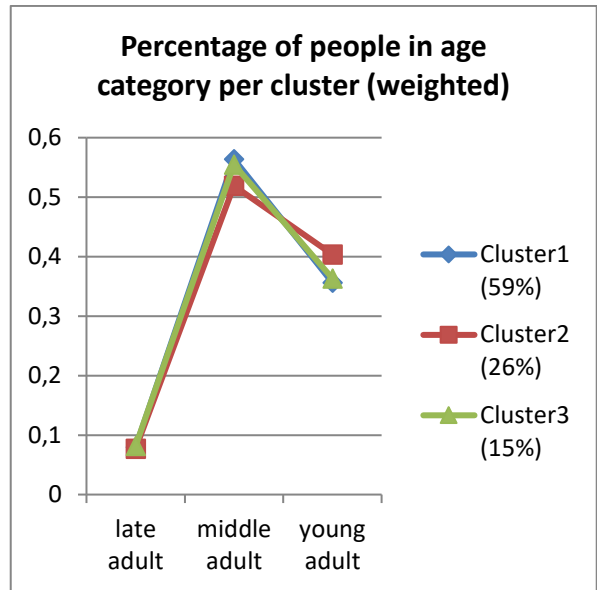


Figure 7.11. Results of weighted cluster analysis with age categories in total sample.

Table S7.13

Goodness-of-fit measures of the 10 investigated cluster models with the **three social needs and the three age categories (weighted sample, n = 11,386)**

	$N_{par}$	$L^2$	$df$	$p$ -value	LL	BIC (LL)	Class.Err
One-cluster model	29	10147	2970	<.001	-72710	145691	0
Two-cluster model	35	4413	2964	<.001	-69843	140013	.08
<b>Three-cluster model</b>	<b>41</b>	<b>2845</b>	<b>2958</b>	<b>.93</b>	<b>-69059</b>	<b>138501</b>	<b>.12</b>
Four-cluster model	47	2399	2952	1	-68836	138110	.16
Five-cluster model	53	2206	2946	1	-68740	137974	.25
Six-cluster model	59	2123	2940	1	-68698	137947	.28
Seven-cluster model	65	2004	2934	1	-68639	137884	.28
Eight-cluster model	71	1932	2928	1	-68603	137868	.31
Nine-cluster model	77	1880	2922	1	-68577	137872	.32
Ten-cluster model	83	1844	2916	1	-68558	137891	.34

**Specification of the options in Latent GOLD.**

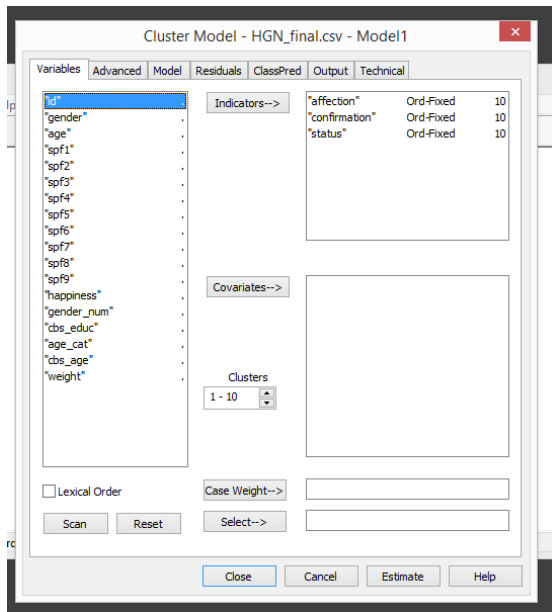


Figure 7.12. Selecting variables.

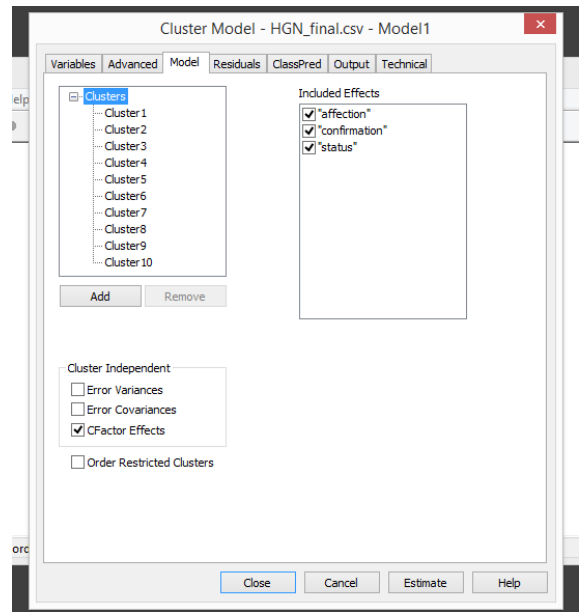


Figure 7.13. Model specification.

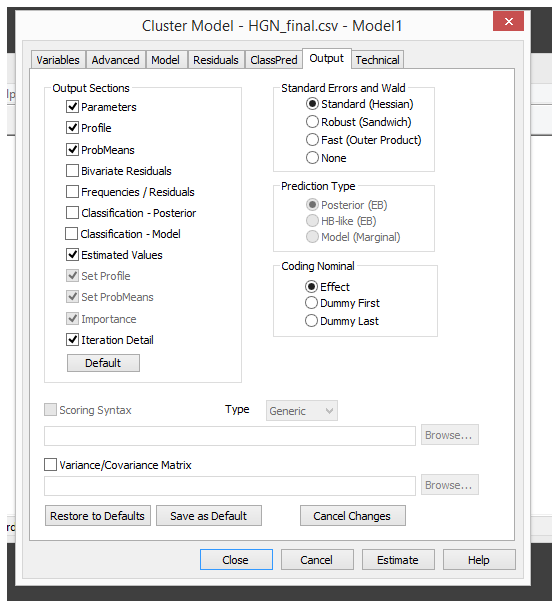


Figure 7.14. Selecting output.

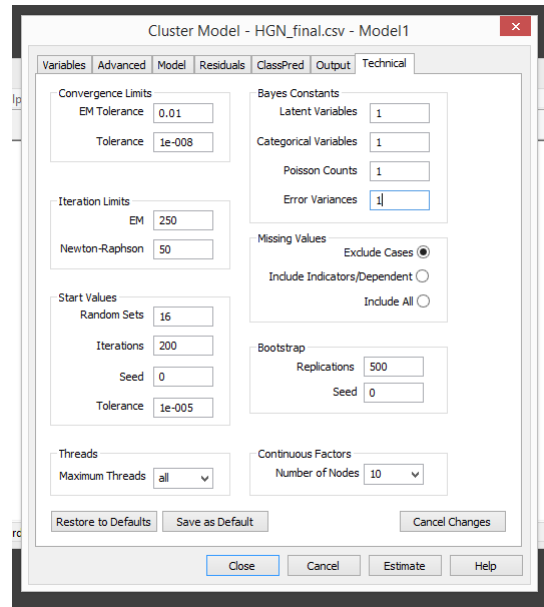


Figure 7.15. Technical specifications.

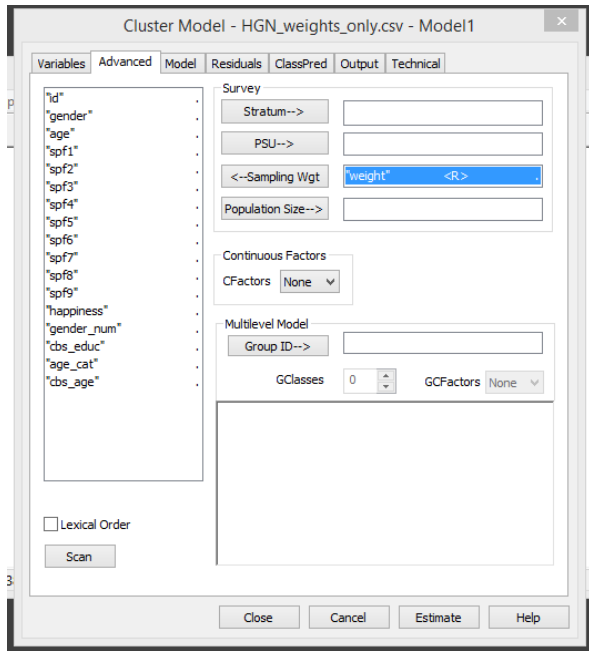


Figure 7.16. Selecting weights.

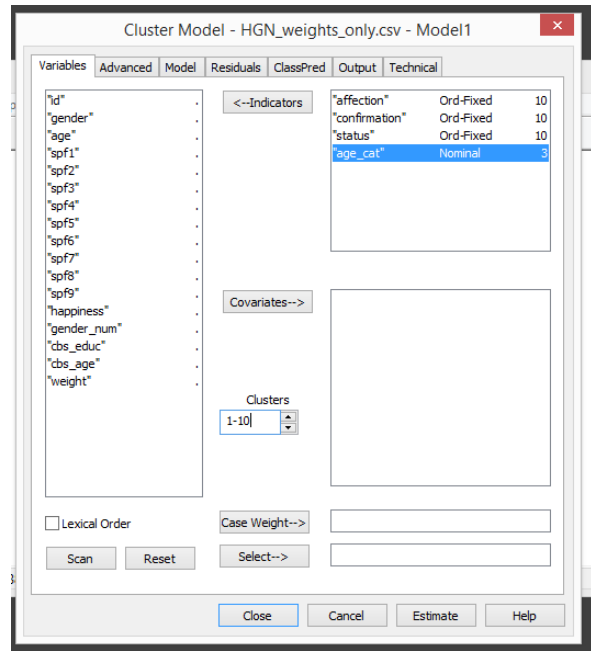


Figure 7.17. Adding age categories.