Supplemental Material

The Development of the Rank-Order Stability of the Big Five Across the Life Span

Table S1

Outline of the Supplemental Material

Restriction of Focal Points and Determination of Age Range

To model the moderating effect of age on the latent rank-order stability, we used local structural equation modeling (LSEM) to estimate the statistical model for each focal point (i.e., each year of age) that was described in the main article. In our analyses, the focal points were defined as participants' year of age in the first wave of measurement (i.e., in 2005). To define the minimum focal point, we counted the number of participants of each age who took part in the last two measurement waves (i.e., in 2013 and 2017). The lowest age that at least $n = 10$ of these participants had constituted the minimum focal point. In a similar fashion, to determine the maximum focal point, we counted how many participants of each age took part in the first two measurement waves (i.e., in 2005 and 2009). The maximum focal point was the highest age that at least $n = 10$ of these participants had, and each age below this age had to be continuously represented by at least $n = 10$ participants.

In the Household, Income and Labour Dynamics in Australia (HILDA) Survey, focal points in LSEM ranged from 7 to 84, and the ranges were identical for Neuroticism, Extraversion, Conscientiousness, Agreeableness, and Openness.[1] In the Socio-Economic Panel (SOEP), the focal points for Extraversion, Conscientiousness, Agreeableness, and Openness ranged from 10 to 86. For Neuroticism, we could not keep 86 as the highest focal point because of the occurrence of Heywood cases. We therefore set the highest focal point for Neuroticism to 85.

We extracted the six standardized latent stabilities (three 4-year stabilities: 2005 to 2009, 2009 to 2013, 2013 to 2017; two 8-year stabilities: 2005 to 2013, 2009 to 2017; one 12-year

[1] Note, this does not mean that 7-year old participants filled out the questionnaire. Instead, participants who reached 15 years of age (the minimum age required for participation in HILDA) for the first time in 2013 accordingly had a focal point value of 7. The same held for the SOEP, with 18 years of age as the minimum age in 2013.

stability: 2005 to 2017) from the LSEM analysis for each focal point. As we used age in 2005 as the focal point for all the rank-order stabilities, but the participants aged during data collection, we next exchanged the focal points for the respective age of the participants in any wave of measurement. For this, 4 was added to the focal points for stabilities starting in 2009 ($age_{2009} = age_{2005} + 4$), and 8 was added to the focal points for the stabilities starting in 2013 ($age_{2013} = age_{2005} + 8$). To obtain robust results, we chose the lower and upper age limits for each of the resulting six rank-order age curves so that every age cell within the range included at least $n = 10$ participants for the calculation of the relevant correlation. When averaging the rank-order age curves from the same time interval (i.e., three 4-year stabilities and two 8-year stabilities), the only ages we used were the ones for which all (i.e., three and two) of the estimated rank-order stabilities were available. Finally, in HILDA, the 4-, 8-, and 12-year stabilities were estimated for ages 15 to 84, 15 to 82, and 15 to 79, respectively (the ranges were identical across the Big Five). In the SOEP, the 4-, 8-, and 12-year stabilities were estimated for ages 18 to 86 (18 to 85 for Neuroticism and, hence, the corresponding mean stability), 18 to 84, and 17 to 80, respectively.

Supplemental Material for Study 1

Item Selection and Psychometric Analyses

All items in HILDA that are used to assess the Big Five are displayed in Table S2. To set the eligibility criteria for participants in the psychometric analyses to be as inclusive as possible, we included all participants who answered at least one item from the respective Big Five factor within one wave (for the sample characteristics, see Table S3 and Table S4). We conducted several confirmatory factor analyses (CFAs) separately for each wave and personality factor. Within a CFA, all items were manifest indicators of one latent construct (i.e., the corresponding personality domain). No residual correlations were allowed, and no additional constraints were added to the measurement model. The comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) were used as fit indices. Prior to the analyses, the reversed items were recoded. To take the missing values in the data into account, full information maximum likelihood estimation (FIML) was used.

If a measurement model consistently did not reach an acceptable level of model fit (i.e., CFI $\leq .95$, RMSEA $\geq .06$, SRMR $\geq .08$; Hu & Bentler, 1999), in the next step, one item was excluded. This procedure was iteratively repeated until an acceptable fit emerged. Semantic as well as statistical criteria, especially factor loadings and modification indices (MIs), were used as indicators of which item to exclude. To avoid overfitting, we only considered statistical features that consistently emerged across all waves.

We estimated CFAs using the package lavaan (Rosseel, 2012). The package semTools (Jorgensen et al., 2018) was used to compute α and ω. All analysis scripts (including more detailed results) are publicly available on the Open Science Framework and can be accessed at https://osf.io/rzfqm/.

Table S2

Overview of the Big Five Items in the Household, Income and Labour Dynamics in Australia Survey

Neuroticism	Extraversion	Conscientiousness	Agreeableness	Openness
Envious [a]	Bashful [a, b]	Careless [b]	Cold [a, b]	Complex
Fretful	Extroverted	Disorganised [b]	Cooperative	Creative [a]
Jealous	Quiet [a, b]	Efficient [a]	Harsh [b]	Deep
Moody	Shy [b]	Inefficient [b]	Kind	Imaginative
Temperamental	Talkative	Sloppy [b]	Sympathetic	Intellectual
Touchy	Withdrawn [a, b]	Systematic [a]	Warm	Philosophical
Calm [b]	Enthusiastic [a]	Orderly	Selfish [a, b]	Traditional [a, b]
	Lively			

Note. In Losoncz (2009), "Traditional" was assigned to Conscientiousness. However, John et al. (2008) pointed out that this item refers to conventionality, which, in turn, is an aspect of Openness. Accordingly, in our analyses, "Traditional" showed only low factor loadings on Conscientiousness.

[a] Excluded item. [b] Reversed item.

Table S3

Sample Characteristics of Participants in the Psychometric Analyses in the Household, Income and Labour Dynamics in Australia Survey

Factor	2005	2009	2013	2017
Neuroticism				
n	11,337	11,430	15,240	15,969
M_{age} (SD_{age})	44.31 (18.08)	44.72 (18.55)	45.13 (18.72)	45.87 (19.02)
Extraversion				
n	11,352	11,432	15,253	15,985
M_{age} (SD_{age})	44.33 (18.09)	44.72 (18.54)	45.14 (18.74)	45.89 (19.03)
Conscientiousness				
n	11,332	11,425	15,234	15,968
M_{age} (SD_{age})	44.31 (18.08)	44.71 (18.53)	45.13 (18.72)	45.88 (19.03)
Agreeableness				
n	11,355	11,447	15,251	15,986
M_{age} (SD_{age})	44.34 (18.10)	44.78 (18.58)	45.15 (18.74)	45.91 (19.04)
Openness				
n	11,315	11,410	15,221	15,959
M_{age} (SD_{age})	44.27 (18.05)	44.70 (18.52)	45.12 (18.71)	45.87 (19.02)

Note. In each analysis, the proportion of female participants was 53%, and the lowest observed age was 15 for each. The highest observed age in 2005, 2009, 2013, and 2017 was 100, 98, 101, and 100, respectively.

Table S4

Number of Participants Across Waves in the Household, Income and Labour Dynamics in Australia Survey

Factor	One wave	Two waves	Three waves	Four waves
Neuroticism	7,117	5,931	3,011	6,491
Extraversion	7,128	5,926	3,006	6,506
Conscientiousness	7,120	5,918	3,013	6,491
Agreeableness	7,108	5,942	3,005	6,508
Openness	7,112	5,914	3,023	6,474

Item Selection: Neuroticism

As shown in Table S5, assessing Neuroticism with seven items returned consistently unsatisfactory psychometric criteria. The highest MI consistently indicated a residual correlation between the items "Envious" and "Jealous," which is not surprising due to their semantic overlap. The second highest MI was considerably smaller. The item "Jealous" had a higher factor loading, and excluding "Envious" consistently led to better fit criteria and higher internal consistencies than excluding "Jealous." We therefore excluded "Envious." Thereafter, the fit indices indicated a good fit.

Table S5

Psychometric Criteria for the Item Selection for Neuroticism

Model	*n*	χ^2 [a]	CFI	RMSEA	SRMR	α	ω
All items (*df* = 14)							
2005	11,340	1,816.11	.909	.107	.044	.79	.80
2009	11,431	1,971.46	.905	.111	.045	.79	.80
2013	15,244	2,683.79	.900	.112	.045	.79	.80
2017	15,976	2,671.74	.908	.109	.042	.80	.80
Excluding "Envious" (*df* = 9)							
2005	11,337	180.49	.989	.041	.016	.77	.78
2009	11,430	244.84	.985	.048	.018	.77	.78
2013	15,240	341.17	.984	.049	.019	.77	.78
2017	15,969	339.20	.985	.048	.018	.77	.78

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

[a] All *p*s < .001.

Item Selection: Extraversion

As can be seen in Table S6, the eight items proposed for measuring Extraversion did not seem appropriate. The highest MI consistently indicated a residual correlation between the items "Enthusiastic" and "Lively," which is not surprising due to their content-related overlap. The second highest MI was considerably smaller. The factor loadings for "Enthusiastic" were the smallest of all the items, and we considered this item less accessible than its counterpart "Lively." Therefore, we excluded "Enthusiastic" in the first step.

Afterwards, the highest MI indicated a residual correlation between "Bashful" and "Shy," which may be considered synonyms. The factor loadings for "Shy" were higher than the factor loadings for "Bashful." When we excluded "Bashful," the fit indices were almost entirely better, and the internal consistencies were higher than when we excluded "Shy." Therefore, we excluded "Bashful."

In the next step, the highest MI indicated a residual correlation between the items "Quiet" and "Shy." The item "Quiet" is the opposite of the item "Talkative." Neither of the two items seemed superior. But the final model (see the next step) yielded a better fit when "Shy" was retained as opposed to "Quiet." Hence, we excluded "Quiet."

In the last step, the highest MI indicated a residual correlation between "Shy" and "Withdrawn." The second highest MI was considerably smaller. The item "Withdrawn" had the lowest factor loading of all the remaining items, and deleting it resulted in a better model fit than deleting "Shy." In addition, "Shy" is a more central adjective for low Extraversion than "Withdrawn" (John et al., 2008). Therefore, we excluded "Withdrawn." Thereafter, the fit indices indicated a good fit.

Table S6

Psychometric Criteria for the Item Selection for Extraversion

Model	*n*	χ^2 [a]	CFI	RMSEA	SRMR	α	ω
All items (*df* = 20)							
2005	11,362	6,402.91	.709	.168	.090	.77	.77
2009	11,438	7,054.13	.702	.175	.094	.77	.78
2013	15,262	8,633.05	.727	.168	.088	.78	.78
2017	15,988	9,791.71	.717	.175	.093	.78	.79
Excluding “Enthusiastic” (*df* = 14)							
2005	11,360	3,518.62	.803	.148	.073	.76	.76
2009	11,438	3,918.08	.795	.156	.077	.76	.77
2013	15,262	4,474.66	.824	.144	.069	.77	.78
2017	15,988	5,450.15	.804	.156	.076	.77	.78
Excluding “Bashful” (*df* = 9)							
2005	11,360	1,922.53	.863	.137	.057	.74	.75
2009	11,438	2,147.90	.859	.144	.059	.75	.76
2013	15,262	2,433.85	.883	.133	.053	.76	.77
2017	15,988	3,261.95	.861	.150	.060	.77	.78
Excluding “Quiet” (*df* = 5)							
2005	11,354	1,083.86	.872	.138	.053	.67	.68
2009	11,432	1,194.69	.868	.144	.054	.68	.69
2013	15,255	1,524.50	.881	.141	.051	.70	.70
2017	15,986	1,966.92	.863	.157	.057	.71	.71
Excluding “Withdrawn” (*df* = 2)							
2005	11,352	45.15	.993	.044	.012	.65	.66
2009	11,432	70.53	.990	.055	.014	.66	.67
2013	15,253	97.46	.989	.056	.015	.67	.68
2017	15,985	101.47	.990	.056	.014	.69	.70

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

[a] All *p*s < .001.

Item Selection: Conscientiousness

Measuring Conscientiousness with seven items did not provide acceptable fit indices (see Table S7). A residual correlation between the items “Systematic” and “Orderly” was indicated by the MIs. The second highest MI was considerably smaller. In our view, “Systematic” may be an item that is difficult for individuals to answer because it describes rather nonconcrete and less obviously behavior-related individual differences than, for example, “Orderly,” “Disorganised,” or “Careless.” Further, “Systematic” had the lowest factor loading of all the items. In addition, excluding “Systematic” usually resulted in better fit criteria and internal consistencies than excluding “Orderly.” We excluded “Systematic.” Excluding this item improved the fit but not to a satisfactory level.

Next, a residual correlation between the items “Efficient” and “Orderly” was indicated by the MIs. The second highest MI was considerably smaller. The factor loading for “Efficient” was lower than the factor loading for “Orderly.” Further, unfortunately, “Efficient” is the opposite of “Inefficient,” which is also used to assess Conscientiousness, indicating a redundancy of in the items. We therefore excluded “Efficient” and then obtained a predominantly acceptable fit.

Table S7

Psychometric Criteria for the Item Selection for Conscientiousness

Model	*n*	χ^2 [a]	CFI	RMSEA	SRMR	α	ω
All items (*df* = 14)							
2005	11,340	3,470.58	.838	.148	.068	.79	.79
2009	11,433	4,163.88	.818	.161	.077	.79	.80
2013	15,236	4,936.40	.834	.152	.072	.79	.80
2017	15,969	6,262.86	.806	.167	.081	.79	.79
Excluding "Systematic" (*df* = 9)							
2005	11,340	1,599.86	.911	.125	.046	.80	.80
2009	11,432	1,790.05	.907	.132	.050	.80	.81
2013	15,235	2,042.56	.918	.122	.045	.80	.80
2017	15,969	2,826.91	.897	.140	.054	.80	.81
Excluding "Efficient" (*df* = 5)							
2005	11,332	267.51	.980	.068	.022	.77	.78
2009	11,425	354.96	.976	.078	.024	.78	.79
2013	15,234	448.70	.976	.076	.024	.77	.78
2017	15,968	545.32	.974	.082	.026	.78	.79

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

[a] All *p*s < .001.

Item Selection: Agreeableness

As Table S8 shows, assessing Agreeableness without excluding any items returned an unacceptable fit. Within each wave, the highest MI indicated a residual correlation between the items "Cold" and "Harsh," and the two adjectives share a closely related semantic meaning. For us, "Cold" seems to be a strictly negative adjective. We deleted the item "Cold," which improved the fit but not to a satisfactory level.

After that, the highest MI indicated a residual correlation between items "Harsh" and "Selfish." The second highest MI was considerably smaller. Because of its clearly morally negative connotation, "Selfish" seemed less adequate for measuring Agreeableness. After excluding "Selfish," the measurement models did not exceed the common cutoff criteria, indicating a good fit.

Table S8

Psychometric Criteria for the Item Selection for Agreeableness

Model	*n*	χ^2 [a]	CFI	RMSEA	SRMR	α	ω
All items (*df* = 14)							
2005	11,356	3,100.66	.843	.139	.072	.78	.77
2009	11,448	3,627.27	.823	.150	.081	.77	.76
2013	15,253	4,385.89	.836	.143	.074	.77	.76
2017	15,986	5,113.15	.824	.151	.080	.78	.76
Excluding “Cold” (*df* = 9)							
2005	11,355	1,379.28	.914	.116	.054	.75	.74
2009	11,447	1,368.00	.916	.115	.056	.74	.73
2013	15,253	1,778.43	.915	.114	.054	.74	.73
2017	15,986	2,105.03	.909	.121	.057	.74	.74
Excluding “Selfish” (*df* = 5)							
2005	11,355	165.41	.988	.053	.017	.74	.74
2009	11,447	63.93	.996	.032	.011	.73	.74
2013	15,251	105.77	.994	.036	.012	.73	.74
2017	15,986	153.43	.992	.043	.013	.74	.74

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

[a] All *p*s < .001.

Item Selection: Openness

Assessing Openness with the seven proposed items resulted in unacceptable psychometric characteristics (see Table S9). The item “Traditional” showed a slight negative loading that was close to zero. We therefore excluded this item, but we still did not reach an acceptable fit.

Next, a residual correlation between the items “Creative” and “Imaginative” was clearly indicated by the MIs. The second highest MI was considerably smaller. A semantic overlap between the two items explained this result. The factor loading for “Creative” was lower than the factor loading for “Imaginative.” Excluding “Creative” yielded higher internal consistencies in comparison with the exclusion of “Imaginative.” Therefore, we excluded “Creative.” Afterwards, the fit was acceptable.

Table S9

Psychometric Criteria for the Item Selection for Openness

Model	*n*	χ^2 [a]	CFI	RMSEA	SRMR	α	ω
All items (*df* = 14)							
2005	11,326	4,397.95	.721	.166	.089	.66	.65
2009	11,422	5,345.67	.696	.183	.080	.67	.70
2013	15,224	6,609.70	.697	.176	.079	.67	.69
2017	15,972	6,887.09	.714	.175	.077	.68	.70
Excluding “Traditional” (*df* = 9)							
2005	11,323	4,112.39	.734	.201	.098	.74	.71
2009	11,417	5,080.03	.706	.222	.088	.75	.75
2013	15,223	6,341.54	.705	.215	.087	.74	.74
2017	15,965	6,540.76	.724	.213	.085	.75	.75
Excluding “Creative” (*df* = 5)							
2005	11,315	452.37	.949	.089	.032	.71	.71
2009	11,410	293.36	.972	.071	.025	.73	.73
2013	15,221	352.12	.973	.068	.024	.72	.72
2017	15,959	363.98	.975	.067	.024	.73	.74

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

[a] All *p*s < .001.

Descriptive Statistics for the Latent Rank-Order Stabilities

Table S10

Descriptive Statistics for the Rank-Order Stabilities in the Household, Income and Labour Dynamics in Australia Survey

Factor	*M*	*SD*	Range
Neuroticism			
4-year stability	.71	.06	.58–.78
8-year stability	.68	.06	.53–.75
12-year stability	.65	.07	.46–.74
Extraversion			
4-year stability	.87	.04	.76–.91
8-year stability	.84	.06	.68–.89
12-year stability	.82	.07	.63–.88
Conscientiousness			
4-year stability	.76	.05	.62–.80
8-year stability	.72	.05	.59–.77
12-year stability	.70	.06	.55–.76
Agreeableness			
4-year stability	.69	.06	.58–.77
8-year stability	.64	.06	.48–.70
12-year stability	.60	.06	.44–.66
Openness			
4-year stability	.78	.04	.69–.83
8-year stability	.74	.05	.60–.79
12-year stability	.70	.06	.56–.77
Mean stabilities			
4-year stability	.76	.05	.65–.81
8-year stability	.72	.05	.58–.77
12-year stability	.69	.06	.53–.75

Regression Models for Describing the Development of Rank-Order Stability by Age

Table S11

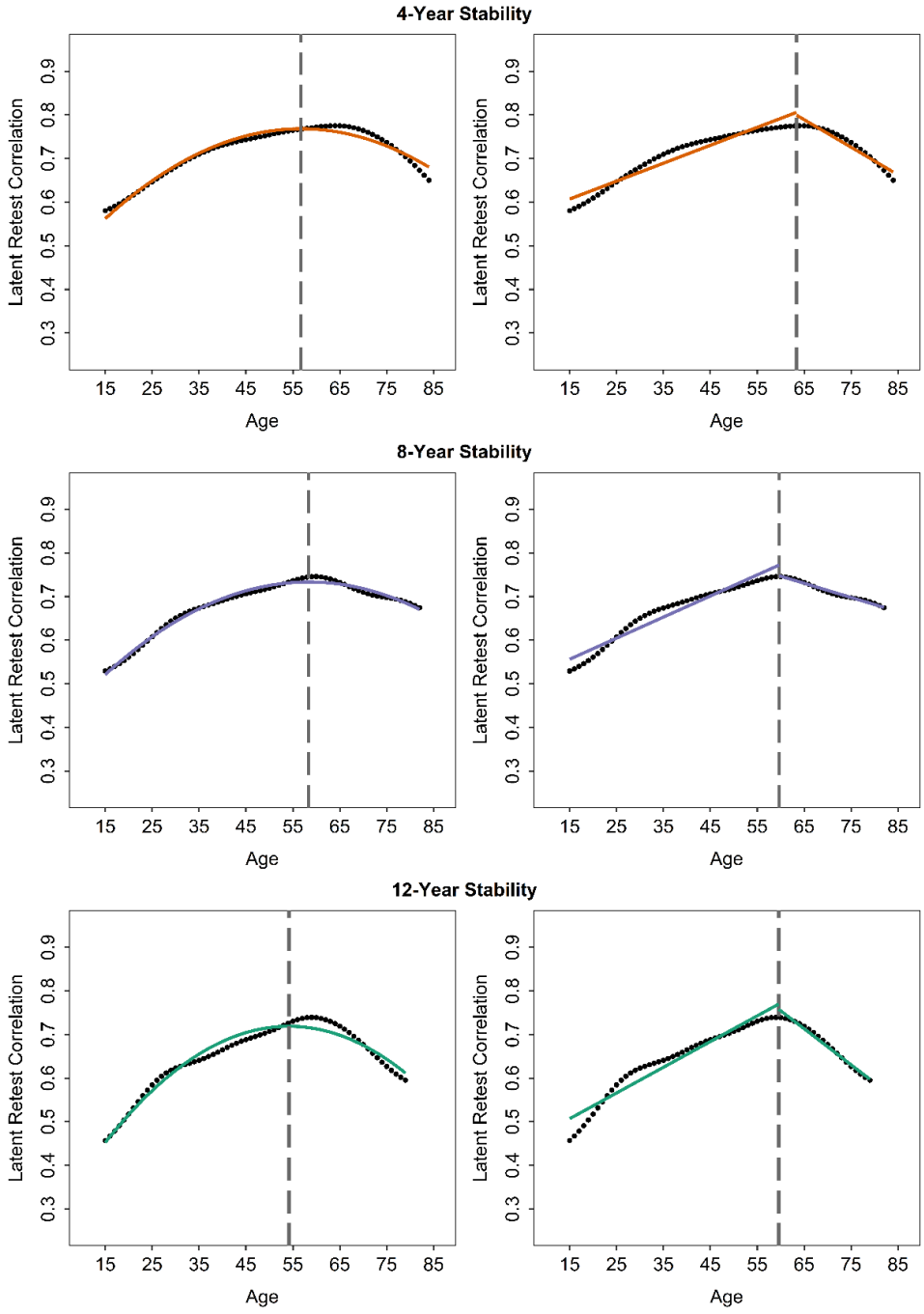
Comparisons of Regression Models for Describing the Development of the Rank-Order Stability by Age in the Household, Income and Labour Dynamics in Australia Survey

Model	AIC		
	4-year stability	8-year stability	12-year stability
Neuroticism			
Intercept	–200.253	–188.231	–151.178
Linear	–231.715	–240.924	–182.949
Exponential	–297.701	–344.767	–249.203
Quadratic	**–439.635**	**–489.857**	**–357.887**
Extraversion			
Intercept	–234.148	–188.689	–159.584
Linear	–270.080	–221.517	–172.396
Exponential	–359.619	–329.492	–243.842
Quadratic	**–452.340**	**–336.909**	**–286.973**
Conscientiousness			
Intercept	–212.074	–214.502	–170.361
Linear	–236.649	–234.916	–193.491
Exponential	–316.519	–330.925	–254.625
Quadratic	**–440.904**	**–427.407**	**–365.170**
Agreeableness			
Intercept	–185.043	–179.432	–169.761
Linear	–183.120	–177.533	–169.091
Exponential	–207.079	–217.521	–209.980
Quadratic	**–362.731**	**–368.634**	**–399.024**
Openness			
Intercept	–235.784	–217.063	–175.322
Linear	–233.790	–220.454	–176.248
Exponential	–260.908	–295.457	–213.989
Quadratic	**–508.615**	**–307.464**	**–506.406**
Mean stabilities			
Intercept	–222.679	–205.599	–174.495
Linear	–231.279	–220.711	–181.427
Exponential	–291.682	–315.129	–237.313
Quadratic	**–535.234**	**–397.362**	**–416.862**

Note. The relatively best fitting model is displayed in bold. AIC = Akaike information criterion.

Figure S1

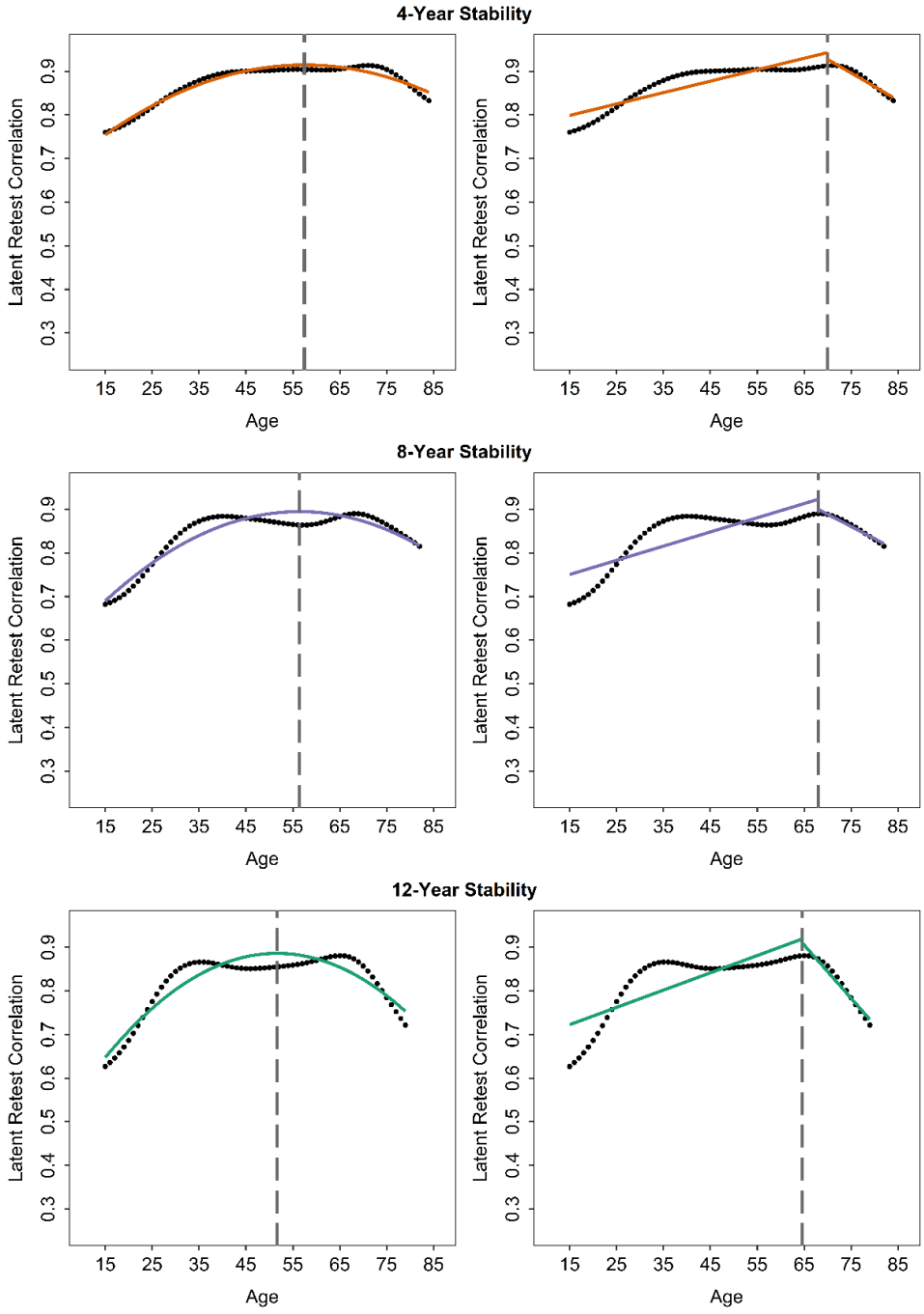
Regression Model (Left Column) and Two-Lines Test (Right Column) for the Stabilities for Neuroticism in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed vertical line indicates the highest point in the quadratic function (left column) or the break point in the two-lines test (right column).

Figure S2

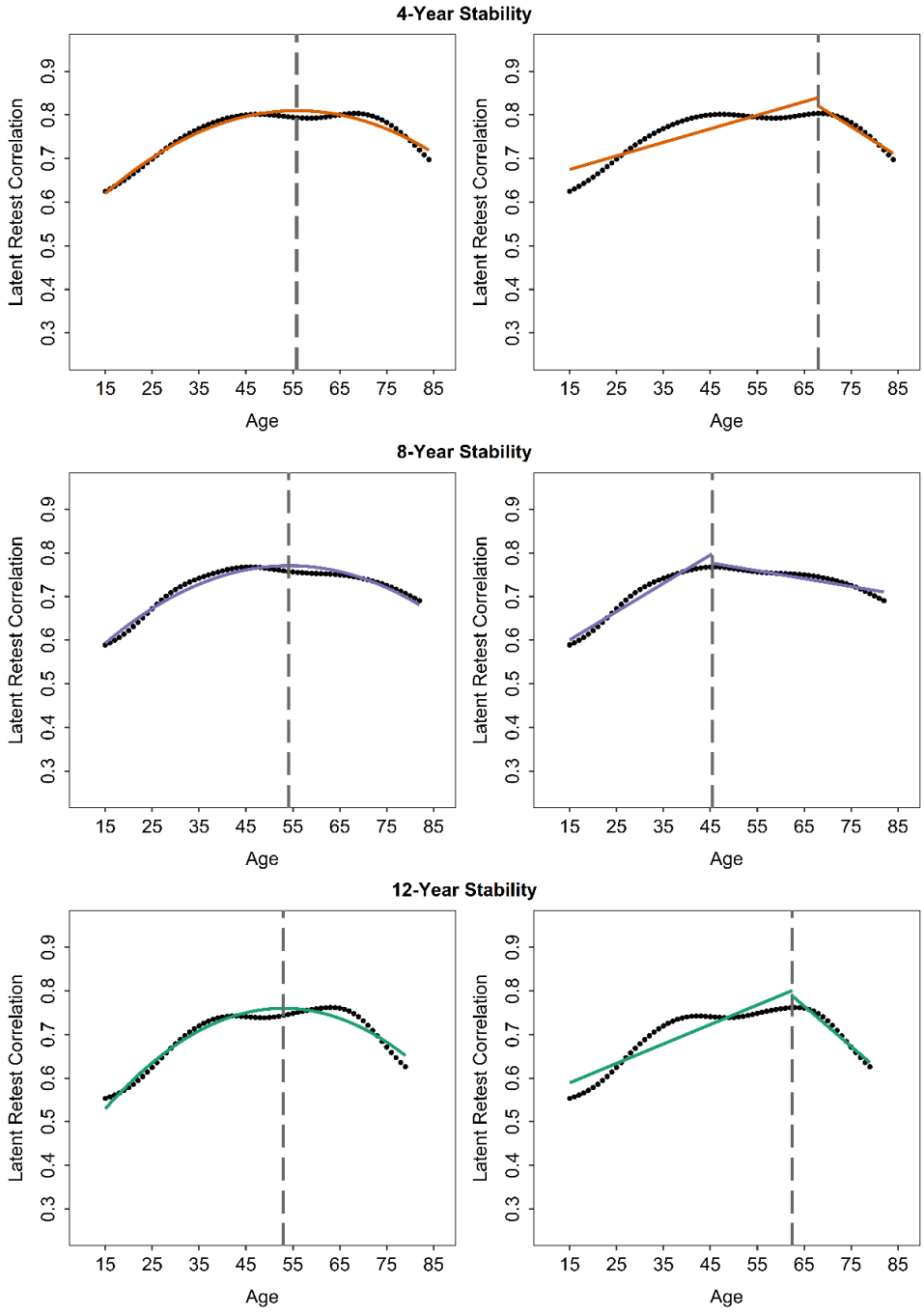
Regression Model (Left Column) and Two-Lines Test (Right Column) for the Stabilities for Extraversion in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed vertical line indicates the highest point in the quadratic function (left column) or the break point in the two-lines test (right column).

Figure S3

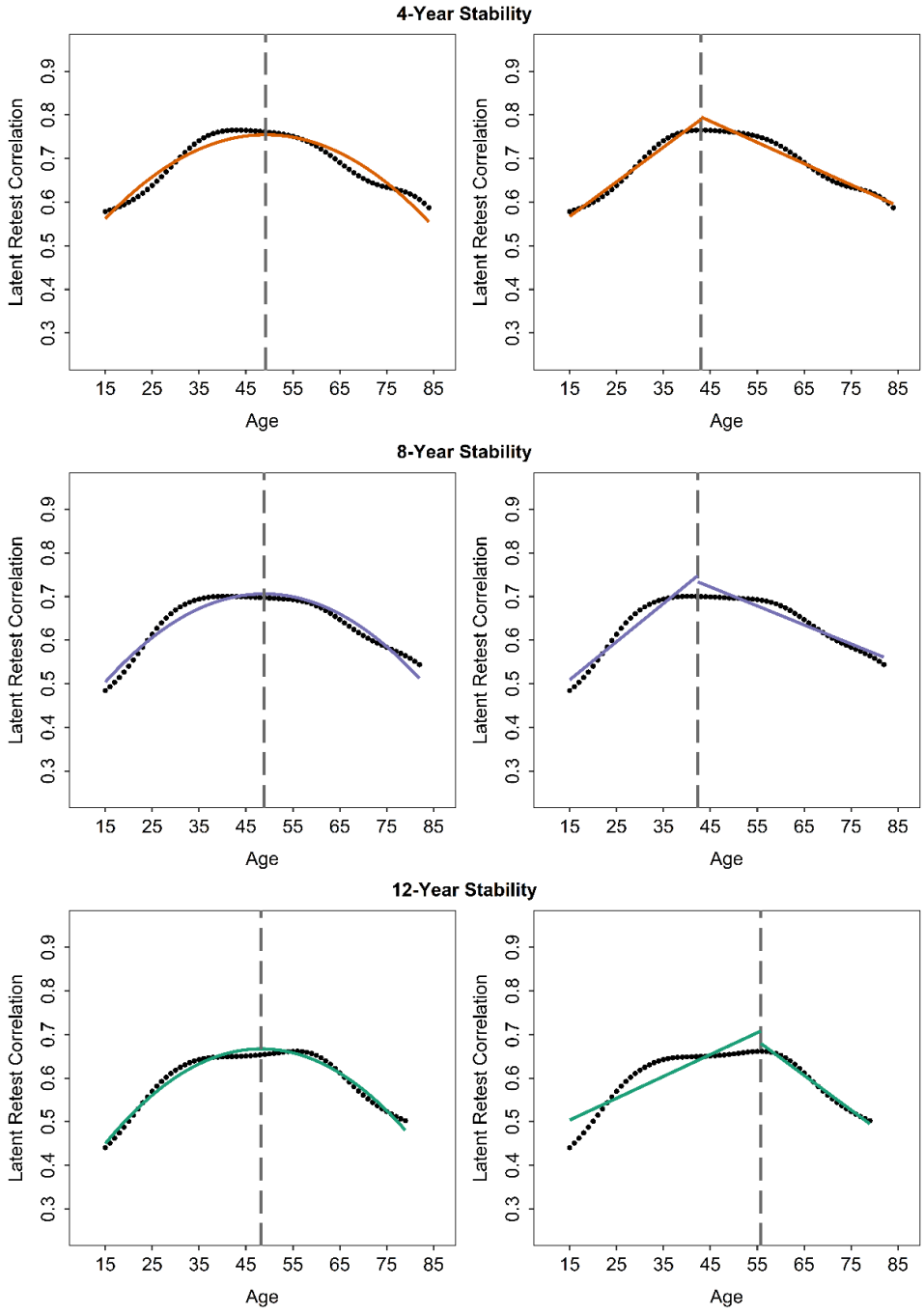
Regression Model (Left Column) and Two-Lines Test (Right Column) for the Stabilities for Conscientiousness in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed vertical line indicates the highest point in the quadratic function (left column) or the break point in the two-lines test (right column).

Figure S4

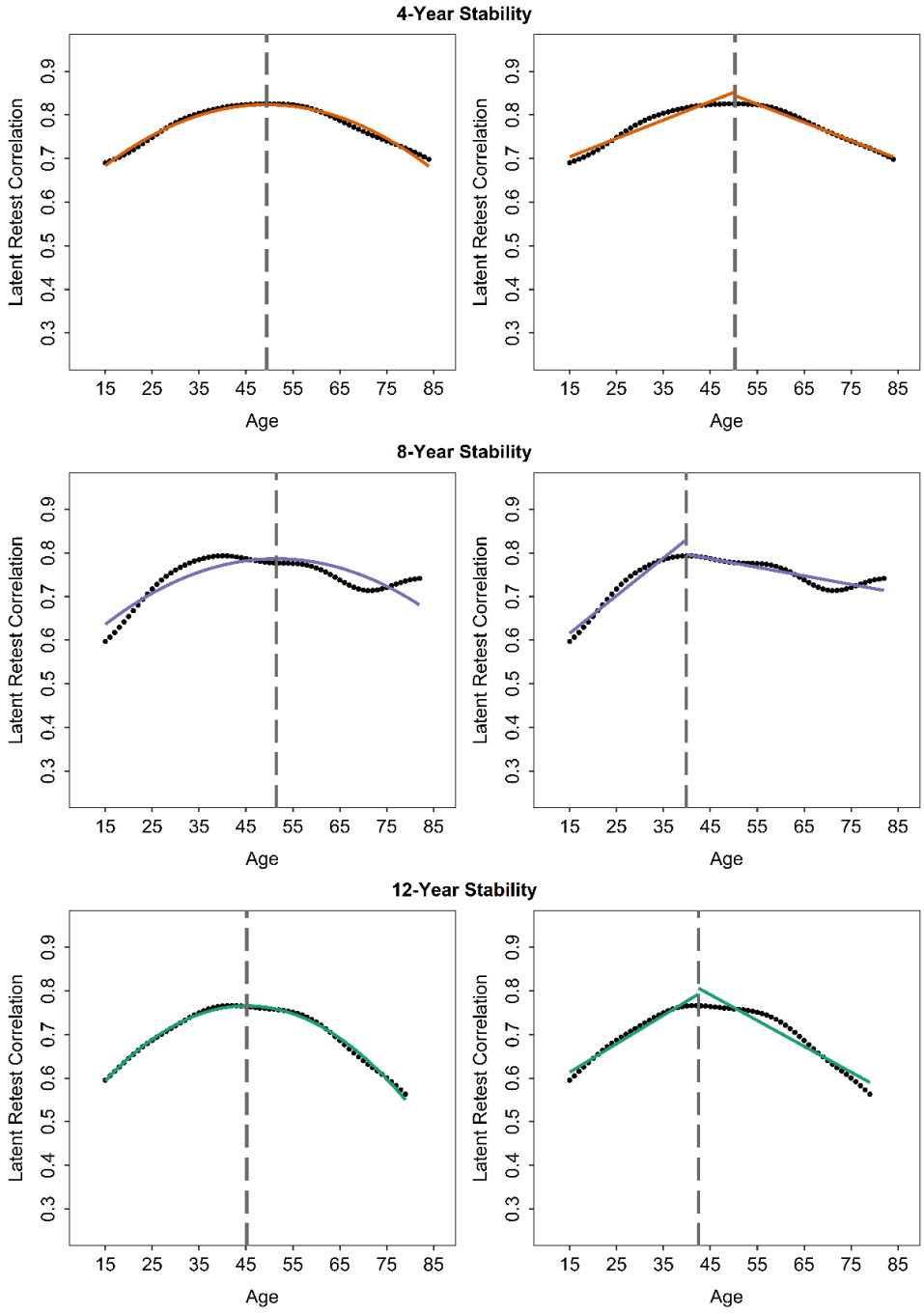
Regression Model (Left Column) and Two-Lines Test (Right Column) for the Stabilities for Agreeableness in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed vertical line indicates the highest point in the quadratic function (left column) or the break point in the two-lines test (right column).

Figure S5

Regression Model (Left Column) and Two-Lines Test (Right Column) for the Stabilities for Openness in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed vertical line indicates the highest point in the quadratic function (left column) or the break point in the two-lines test (right column).

Table S12

Parameters in the Regression Models for Describing the Development of Rank-Order Stability by Age in the Household, Income and Labour Dynamics in Australia Survey

Model	b_0			b_1			b_2		
	Estimate	*t*	*p*	Estimate	*t*	*p*	Estimate	*t*	*p*
				Neuroticism					
4-year stability									
Intercept	0.7137	105.38	< .001						
Linear	0.6287	44.23	< .001	0.0017	6.46	< .001			
Exponential	0.7493	130.39	< .001	–0.6847	–4.31	< .001	–0.0826	–6.52	< .001
Quadratic	0.3872	51.79	< .001	0.0134	40.31	< .001	–0.0001	–35.74	< .001
8-year stability									
Intercept	0.6789	94.39	< .001						
Linear	0.5707	44.17	< .001	0.0022	9.03	< .001			
Exponential	0.7222	173.11	< .001	–0.7122	–7.58	< .001	–0.0778	–10.71	< .001
Quadratic	0.3487	71.70	< .001	0.0132	59.67	< .001	–0.0001	–50.38	< .001
12-year stability									
Intercept	0.6488	70.77	< .001						
Linear	0.5319	27.67	< .001	0.0025	6.55	< .001			
Exponential	0.6950	97.10	< .001	–1.0462	–4.14	< .001	–0.0918	–6.83	< .001
Quadratic	0.2093	17.52	< .001	0.0188	33.68	< .001	–0.0002	–29.68	< .001
				Extraversion					
4-year stability									
Intercept	0.8726	164.15	< .001						
Linear	0.8026	74.27	< .001	0.0014	6.99	< .001			
Exponential	0.9001	260.57	< .001	–0.6468	–5.18	< .001	–0.0904	–8.55	< .001
Quadratic	0.6211	90.97	< .001	0.0102	33.57	< .001	–0.0001	–29.41	< .001
8-year stability									
Intercept	0.8412	117.35	< .001						
Linear	0.7494	50.29	< .001	0.0019	6.64	< .001			
Exponential	0.8747	237.42	< .001	–1.2004	–5.24	< .001	–0.1087	–10.22	< .001
Quadratic	0.5143	34.34	< .001	0.0135	19.84	< .001	–0.0001	–17.33	< .001
12-year stability									
Intercept	0.8197	95.38	< .001						
Linear	0.7420	35.59	< .001	0.0017	4.02	< .001			
Exponential	0.8507	145.11	< .001	–2.3080	–2.58	.012	–0.1433	–6.42	< .001
Quadratic	0.4115	19.96	< .001	0.0184	19.07	< .001	–0.0002	–17.63	< .001

Model	b_0			b_1			b_2		
	Estimate	*t*	*p*	Estimate	*t*	*p*	Estimate	*t*	*p*
Conscientiousness									
4-year stability									
Intercept	0.7588	121.91	< .001						
Linear	0.6876	50.11	< .001	0.0014	5.60	< .001			
Exponential	0.7877	179.10	< .001	–0.8717	–4.00	< .001	–0.1003	–7.28	< .001
Quadratic	0.4547	61.38	< .001	0.0127	38.56	< .001	–0.0001	–34.77	< .001
8-year stability									
Intercept	0.7223	121.83	< .001						
Linear	0.6588	48.78	< .001	0.0013	5.08	< .001			
Exponential	0.7480	212.87	< .001	–1.1114	–4.02	< .001	–0.1169	–8.39	< .001
Quadratic	0.4306	55.94	< .001	0.0126	35.94	< .001	–0.0001	–32.71	< .001
12-year stability									
Intercept	0.6982	88.26	< .001						
Linear	0.6084	34.32	< .001	0.0019	5.45	< .001			
Exponential	0.7349	112.36	< .001	–0.9773	–3.43	.001	–0.0982	–6.05	< .001
Quadratic	0.3115	27.57	< .001	0.0169	32.06	< .001	–0.0002	–28.90	< .001
Agreeableness									
4-year stability									
Intercept	0.6871	91.01	< .001						
Linear	0.6921	34.42	< .001	–0.0001	–0.27	.785			
Exponential	0.7038	87.55	< .001	–1.6541	–1.00	.319	–0.1531	–2.66	.010
Quadratic	0.3549	27.41	< .001	0.0162	28.16	< .001	–0.0002	–28.81	< .001
8-year stability									
Intercept	0.6380	83.15	< .001						
Linear	0.6320	30.69	< .001	0.0001	0.31	.755			
Exponential	0.6568	94.40	< .001	–3.2300	–1.18	.242	–0.1815	–3.64	.001
Quadratic	0.2843	23.97	< .001	0.0173	32.07	< .001	–0.0002	–32.36	< .001
12-year stability									
Intercept	0.5974	75.18	< .001						
Linear	0.5748	26.88	< .001	0.0005	1.14	.258			
Exponential	0.6185	85.75	< .001	–2.6778	–1.31	.195	–0.1687	–3.77	< .001
Quadratic	0.2087	23.97	< .001	0.0190	46.68	< .001	–0.0002	–46.22	< .001

Model	b_0			b_1			b_2		
	Estimate	*t*	*p*	Estimate	*t*	*p*	Estimate	*t*	*p*
				Openness					
4-year stability									
Intercept	0.7752	147.54	< .001						
Linear	0.7761	55.42	< .001	< –.0001	–0.07	.942			
Exponential	0.7872	145.12	< .001	–1.3075	–1.05	.299	–0.1578	–2.86	.006
Quadratic	0.5344	116.99	< .001	0.0117	57.51	< .001	–0.0001	–58.56	< .001
8-year stability									
Intercept	0.7420	127.53	< .001						
Linear	0.7095	47.24	< .001	0.0007	2.33	.023			
Exponential	0.7602	190.98	< .001	–2.5395	–2.06	.043	–0.1712	–6.03	< .001
Quadratic	0.4862	26.15	< .001	0.0117	13.83	< .001	–0.0001	–13.25	< .001
12-year stability									
Intercept	0.6988	91.77	< .001						
Linear	0.7308	36.11	< .001	–0.0007	–1.70	.093			
Exponential	0.7214	96.36	< .001	< –.0001	–0.34	.734	0.1378	3.62	.001
Quadratic	0.3804	99.80	< .001	0.0171	95.66	< .001	–0.0002	–101.05	< .001
				Mean stabilities					
4-year stability									
Intercept	0.7615	131.97	< .001						
Linear	0.7174	50.32	< .001	.0009	3.33	.001			
Exponential	0.7834	161.25	< .001	–0.9734	–2.52	.014	–0.1166	–5.25	< .001
Quadratic	0.4705	124.57	< .001	0.0129	76.45	< .001	–0.0001	–72.34	< .001
8-year stability									
Intercept	0.7245	114.45	< .001						
Linear	0.6641	44.30	< .001	0.0012	4.35	< .001			
Exponential	0.7498	198.67	< .001	–1.4562	–3.50	< .001	–0.1294	–7.98	< .001
Quadratic	0.4128	43.00	< .001	0.0136	31.28	< .001	–0.0001	–28.88	< .001
12-year stability									
Intercept	0.6926	90.39	< .001						
Linear	0.6376	32.78	< .001	0.0012	3.05	.003			
Exponential	0.7192	114.32	< .001	–1.6883	–2.12	.038	–0.1359	–5.03	< .001
Quadratic	0.3043	40.08	< .001	0.0180	50.82	< .001	–0.0002	–48.27	< .001

Note. Intercept model: $stability_i = b_0 + e_i$. Linear model: $stability_i = b_0 + b_1 age_i + e_i$. Exponential model: $stability_i = b_0 + b_1 \exp(b_2 age_i) + e_i$. Quadratic model: $stability_i = b_0 + b_1 age_i + b_2 age_i^2 + e_i$.

Table S13

Parameters in the Two-Lines Tests for Describing the Development of Rank-Order Stability by Age in the Household, Income and Labour Dynamics in Australia Survey

Model	b_0	b_1	*BP*	b_2	b_3
			Neuroticism		
4-year stability					
Estimate	0.8058	0.0041	63.36	–0.0063	–0.0065
z	150.48	20.22		–11.62	–0.78
p	< .001	< .001		< .001	.436
8-year stability					
Estimate	0.7722	0.0048	59.66	–0.0032	–0.0246
z	157.97	21.63		–42.02	–4.91
p	< .001	< .001		< .001	< .001
12-year stability					
Estimate	0.7699	0.0059	59.57	–0.0082	–0.0120
z	130.93	18.69		–24.29	–1.61
p	< .001	< .001		< .001	.107
			Extraversion		
4-year stability					
Estimate	0.9426	0.0026	69.93	–0.0062	–0.0147
z	149.34	11.57		–10.04	–1.74
p	< .001	< .001		< .001	.081
8-year stability					
Estimate	0.9229	0.0033	68.00	–0.0056	–0.0254
z	100.92	8.43		–13.16	–2.43
p	< .001	< .001		< .001	.015
12-year stability					
Estimate	0.9193	0.0040	64.62	–0.0122	–0.0095
z	85.39	7.40		–11.91	–0.66
p	< .001	< .001		< .001	.507

Model	b_0	b_1	*BP*	b_2	b_3
			Conscientiousness		
4-year stability					
Estimate	0.8397	0.0031	68.00	–0.0068	–0.0219
z	108.15	10.91		–10.47	–2.15
p	< .001	< .001		< .001	.032
8-year stability					
Estimate	0.7978	0.0065	45.37	–0.0018	–0.0213
z	128.40	19.93		–11.81	–3.21
p	< .001	< .001		< .001	.001
12-year stability					
Estimate	0.8010	0.0045	62.48	–0.0092	–0.0124
z	99.35	14.11		–12.94	–1.11
p	< .001	< .001		< .001	.267
			Agreeableness		
4-year stability					
Estimate	0.7898	0.0080	43.01	–0.0049	0.0054
z	145.61	27.15		–29.54	0.75
p	< .001	< .001		< .001	.454
8-year stability					
Estimate	0.7477	0.0087	42.29	–0.0044	–0.0141
z	67.20	13.33		–18.48	–1.10
p	< .001	< .001		< .001	.270
12-year stability					
Estimate	0.7079	0.0050	55.76	–0.0079	–0.0282
z	67.88	9.62		–30.20	–2.52
p	< .001	< .001		< .001	.012

Model	b_0	b_1	*BP*	b_2	b_3
		Openness			
4-year stability					
Estimate	0.8528	0.0042	50.26	–0.0042	–0.0084
z	156.51	16.77		–31.74	–1.34
p	< .001	< .001		< .001	.180
8-year stability					
Estimate	0.8305	0.0086	39.86	–0.0020	–0.0339
z	100.85	16.08		–11.34	–3.96
p	< .001	< .001		< .001	< .001
12-year stability					
Estimate	0.7927	0.0065	42.47	–0.0059	0.0137
z	146.98	19.24		–16.74	1.41
p	< .001	< .001		< .001	.159
		Mean stabilities			
4-year stability					
Estimate	0.8436	0.0052	50.78	–0.0032	–0.0152
z	129.96	18.61		–11.34	–1.92
p	< .001	< .001		< .001	.055
8-year stability					
Estimate	0.8118	0.0073	45.00	–0.0020	–0.0297
z	91.73	15.58		–14.66	–3.16
p	< .001	< .001		< .001	.002
12-year stability					
Estimate	0.7957	0.0048	57.59	–0.0076	–0.0181
z	84.14	10.89		–15.50	–1.57
p	< .001	< .001		< .001	.116

Note. BP = break point. Regression model for the two-lines test: $stability_i = b_0 + b_1 age_{i(\text{low})} + b_2 age_{i(\text{high})} + b_3 high + e_i$. Where $age_{i(\text{low})} = age_i - BP$ if $age_i < BP$ and 0 otherwise, $age_{i(\text{high})} = age_i - BP$ if $age_i \geq BP$ and 0 otherwise, and $high = 1$ if $age_i \geq BP$ and 0 otherwise.

Supplemental Material for Study 2

Psychometric Analyses

Table S14

Overview of the Big Five Items in the Socio-Economic Panel

English (translated)	German (original)
Neuroticism	
worries often	sich oft Sorgen macht
gets nervous easily	leicht nervös wird
is relaxed, handles stress well [a]	entspannt ist, mit Stress gut umgehen kann [a]
Extraversion	
is communicative, talkative	kommunikativ, gesprächig ist
can be outgoing, is sociable	aus sich herausgehen kann, gesellig ist
is reserved [a]	zurückhaltend ist [a]
Conscientiousness	
works thoroughly	gründlich arbeitet
is rather lazy [a]	eher faul ist [a]
is effective and efficient in completing tasks	Aufgaben wirksam und effizient erledigt
Agreeableness	
is sometimes a bit rude to others [a]	manchmal etwas grob zu anderen ist [a]
can forgive	verzeihen kann
is considerate and kind to others	rücksichtsvoll und freundlich mit anderen umgeht
Openness	
is original, comes up with new ideas	originell ist, neue Ideen einbringt
values artistic, aesthetic experiences [b]	künstlerische Erfahrungen schätzt [b]
has a vivid fantasy, imagination	eine lebhafte Phantasie, Vorstellungen hat

Note. Each item completed the sentence "I am someone who …" ["Ich bin jemand, der …"]. In 2009, 2013, and 2017, an additional item ("is eager for knowledge" ["wissbegierig ist"]) was added for Openness. We excluded this item from all our analyses.

[a] Reversed item. [b] In 2005, this item was "values artistic experiences" ["künstlerische Erfahrungen schätzt"].

Table S15

Sample Characteristics of Participants in the Psychometric Analyses in the Socio-Economic Panel

Factor	2005	2009	2013	2017
Neuroticism				
n	21,030	20,713	19,077	29,528
M_{age} (SD_{age})	47.39 (17.58)	49.86 (17.68)	52.31 (17.85)	47.34 (17.38)
Extraversion				
n	21,033	20,708	19,074	29,529
M_{age} (SD_{age})	47.39 (17.57)	49.86 (17.68)	52.31 (17.85)	47.34 (17.38)
Conscientiousness				
n	21,027	20,709	19,071	29,526
M_{age} (SD_{age})	47.38 (17.57)	49.87 (17.68)	52.31 (17.85)	47.34 (17.38)
Agreeableness				
n	21,039	20,717	19,078	29,533
M_{age} (SD_{age})	47.40 (17.58)	49.87 (17.68)	52.31 (17.86)	47.34 (17.38)
Openness				
n	21,014	20,700	19,072	29,506
M_{age} (SD_{age})	47.36 (17.56)	49.86 (17.67)	52.30 (17.85)	47.34 (17.38)

Note. In each analysis, the proportion of female participants was 52% or 53%. The age range in 2005, 2009, 2013, and 2017 was 16 to 96, 17 to 100, 18 to 103, and 18 to 102, respectively.

Table S16

Number of Participants Across Waves in the Socio-Economic Panel

Factor	One wave	Two waves	Three waves	Four waves
Neuroticism	28,151	10,193	4,489	7,086
Extraversion	28,151	10,189	4,485	7,090
Conscientiousness	28,157	10,186	4,492	7,082
Agreeableness	28,156	10,194	4,489	7,089
Openness	28,129	10,191	4,491	7,077

Table S17

Internal Consistencies of the Big Five Measures per Wave in the Socio-Economic Panel

Factor	2005	2009	2013	2017
Neuroticism				
α	.60	.62	.62	.59
ω	.63	.63	.64	.61
Extraversion				
α	.66	.66	.66	.66
ω	.67	.67	.67	.67
Conscientiousness				
α	.62	.59	.58	.61
ω	.63	.60	.58	.62
Agreeableness				
α	.51	.50	.48	.51
ω	.53	.51	.49	.52
Openness				
α	.63	.62	.60	.60
ω	.63	.62	.60	.61

Descriptive Statistics for the Latent Rank-Order Stabilities

Table S18

Descriptive Statistics for the Rank-Order Stabilities in the Socio-Economic Panel

Factor	*M*	*SD*	Range
Neuroticism			
4-year stability	.76	.03	.66–.78
8-year stability	.70	.04	.56–.74
12-year stability	.65	.06	.50–.72
Extraversion			
4-year stability	.76	.05	.62–.81
8-year stability	.72	.07	.50–.78
12-year stability	.68	.04	.57–.74
Conscientiousness			
4-year stability	.65	.03	.60–.68
8-year stability	.58	.04	.51–.63
12-year stability	.52	.08	.34–.61
Agreeableness			
4-year stability	.70	.04	.60–.75
8-year stability	.64	.04	.53–.68
12-year stability	.59	.05	.45–.67
Openness			
4-year stability	.73	.03	.64–.78
8-year stability	.67	.03	.56–.71
12-year stability	.62	.03	.59–.68
Mean stabilities			
4-year stability	.72	.03	.64–.75
8-year stability	.66	.04	.57–.70
12-year stability	.61	.04	.50–.66

Regression Models for Describing the Development of Rank-Order Stability by Age

Table S19

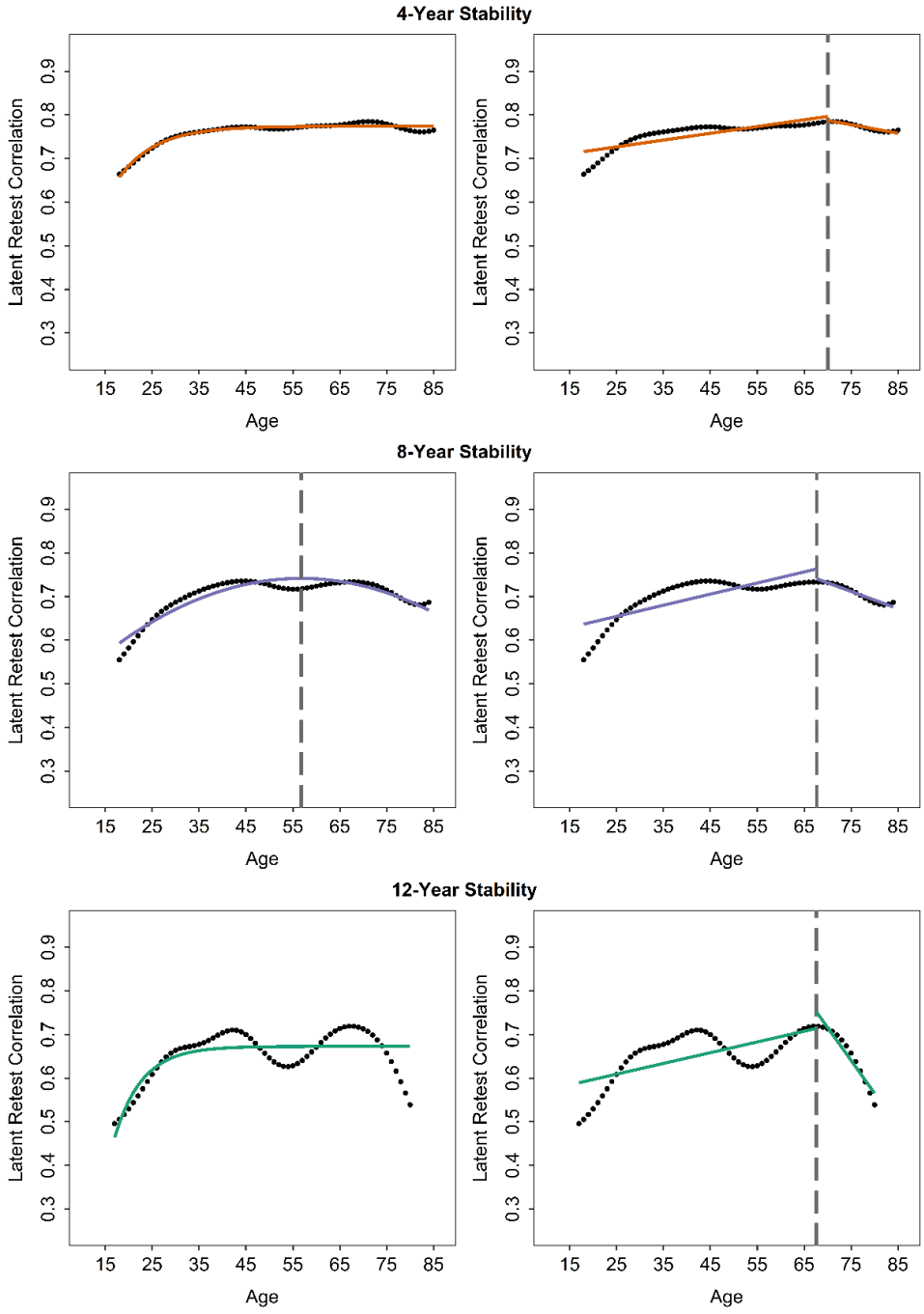
Comparisons of Regression Models for Describing the Development of Rank-Order Stability by Age in the Socio-Economic Panel

Model	AIC		
	4-year stability	8-year stability	12-year stability
Neuroticism			
Intercept	–294.709	–229.582	–180.655
Linear	–337.215	–248.891	–188.941
Exponential	**–509.880**	–366.636	**–233.924**
Quadratic	–430.709	**–368.197**	–233.518
Extraversion			
Intercept	–215.186	–158.336	–213.615
Linear	–229.512	–206.683	–251.713
Exponential	–300.066	–331.075	–319.021
Quadratic	**–440.471**	**–400.398**	**–376.202**
Conscientiousness			
Intercept	–293.070	–239.868	–140.700
Linear	–291.940	–239.026	–140.577
Exponential	–316.033	–274.863	–175.089
Quadratic	**–408.988**	**–349.562**	**–344.030**
Agreeableness			
Intercept	–241.634	–242.895	–204.803
Linear	–239.643	–241.636	–303.809
Exponential	–272.671	–293.213	**–385.614**
Quadratic	**–399.468**	**–370.830**	–346.925
Openness			
Intercept	–282.722	–256.337	–283.445
Linear	–282.811	–254.397	–306.054
Exponential	–342.104	–297.438	–310.409
Quadratic	**–370.112**	**–324.307**	**–316.715**
Mean stabilities			
Intercept	–279.763	–244.839	–233.170
Linear	–278.089	–243.767	–243.045
Exponential	–318.384	–271.201	–301.501
Quadratic	**–532.378**	**–408.676**	**–420.988**

Note. The relatively best fitting model is displayed in bold. AIC = Akaike information criterion.

Figure S6

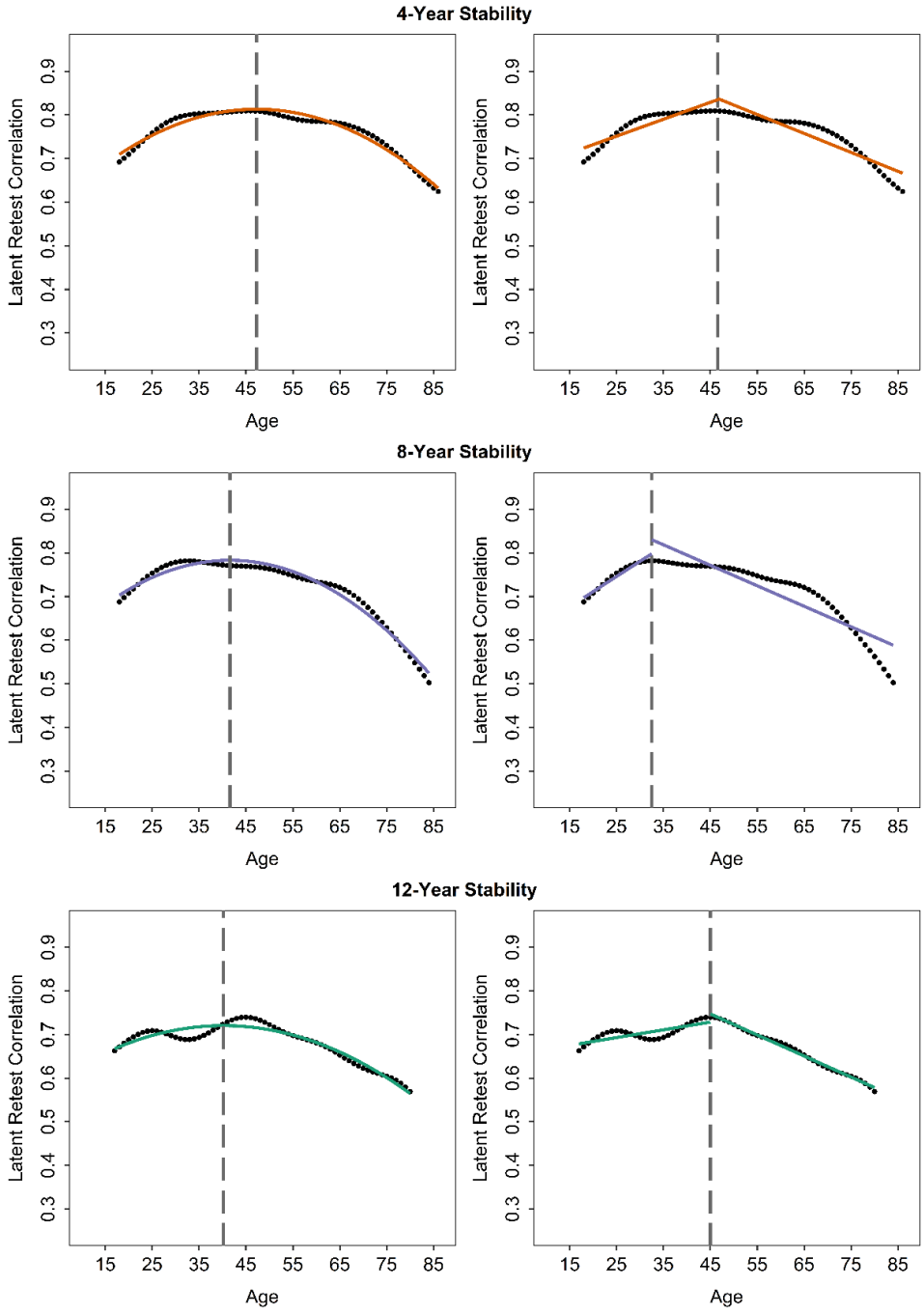
Regression Model (Left Column) and Two-Lines Test (Right Column) for the Stabilities for Neuroticism in the Socio-Economic Panel



Note. The dashed vertical line indicates the highest point in the quadratic function (left column) or the break point in the two-lines test (right column).

Figure S7

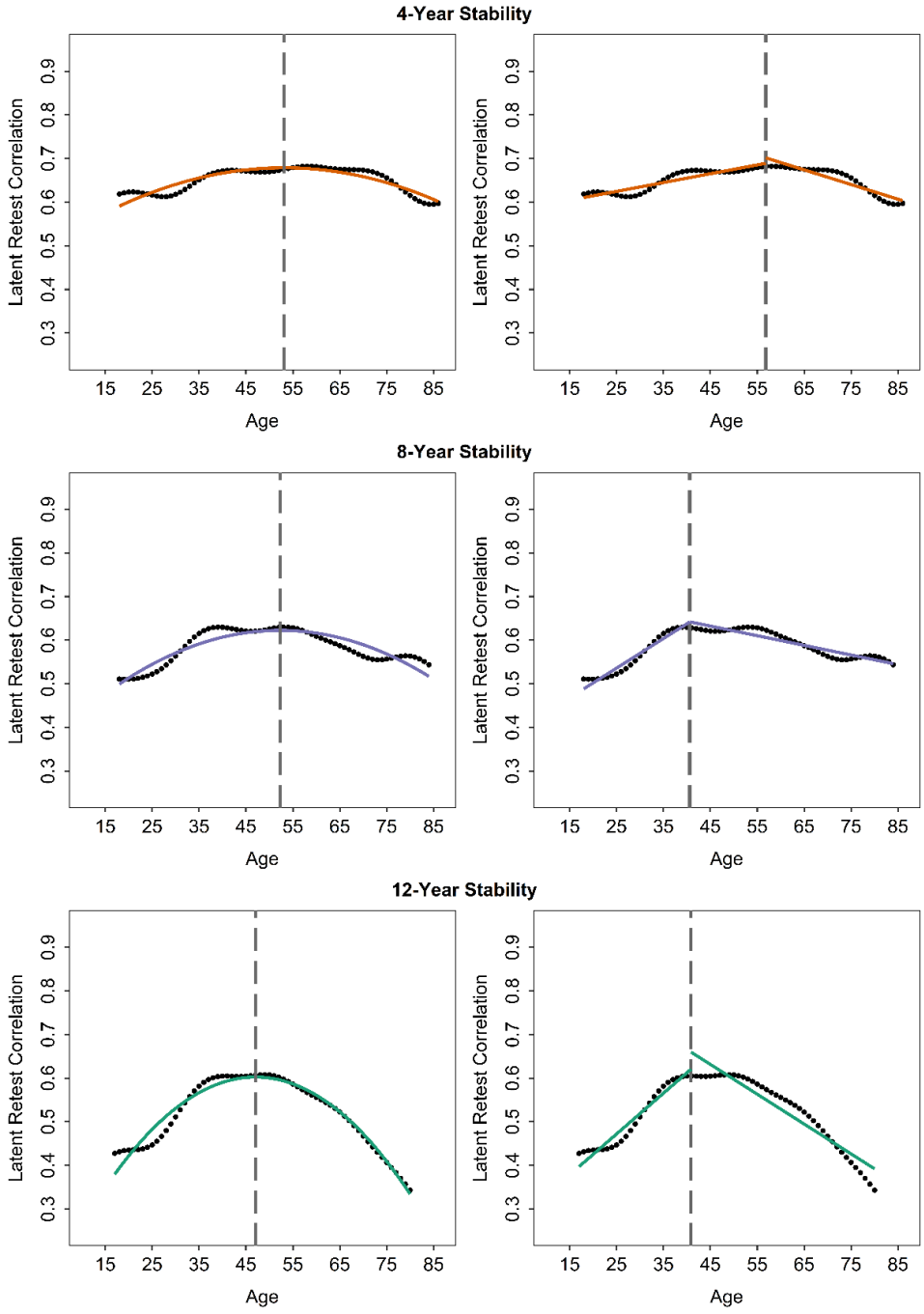
Regression Model (Left Column) and Two-Lines Test (Right Column) for the Stabilities for Extraversion in the Socio-Economic Panel



Note. The dashed vertical line indicates the highest point in the quadratic function (left column) or the break point in the two-lines test (right column).

Figure S8

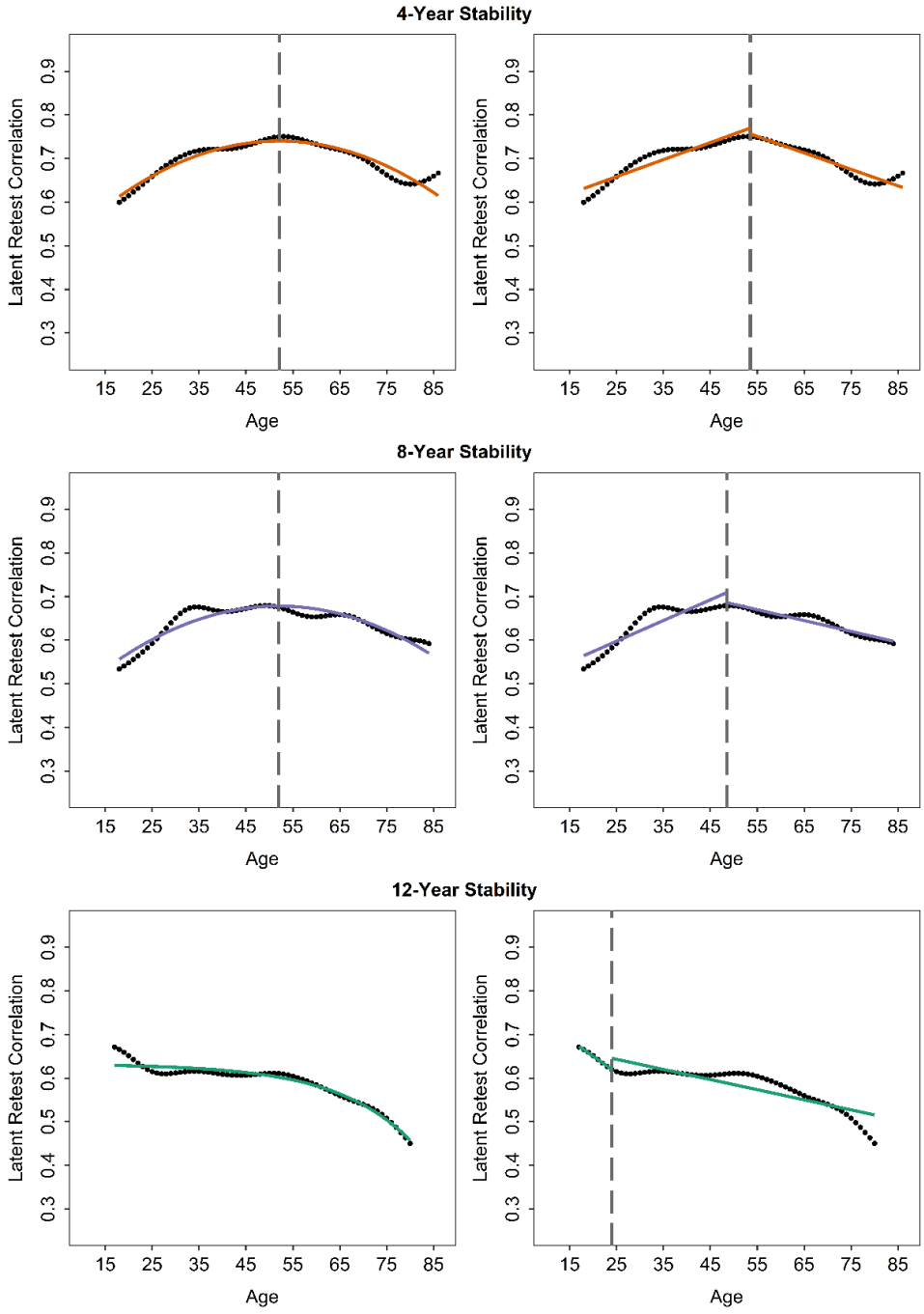
Regression Model (Left Column) and Two-Lines Test (Right Column) for the Stabilities for Conscientiousness in the Socio-Economic Panel



Note. The dashed vertical line indicates the highest point in the quadratic function (left column) or the break point in the two-lines test (right column).

Figure S9

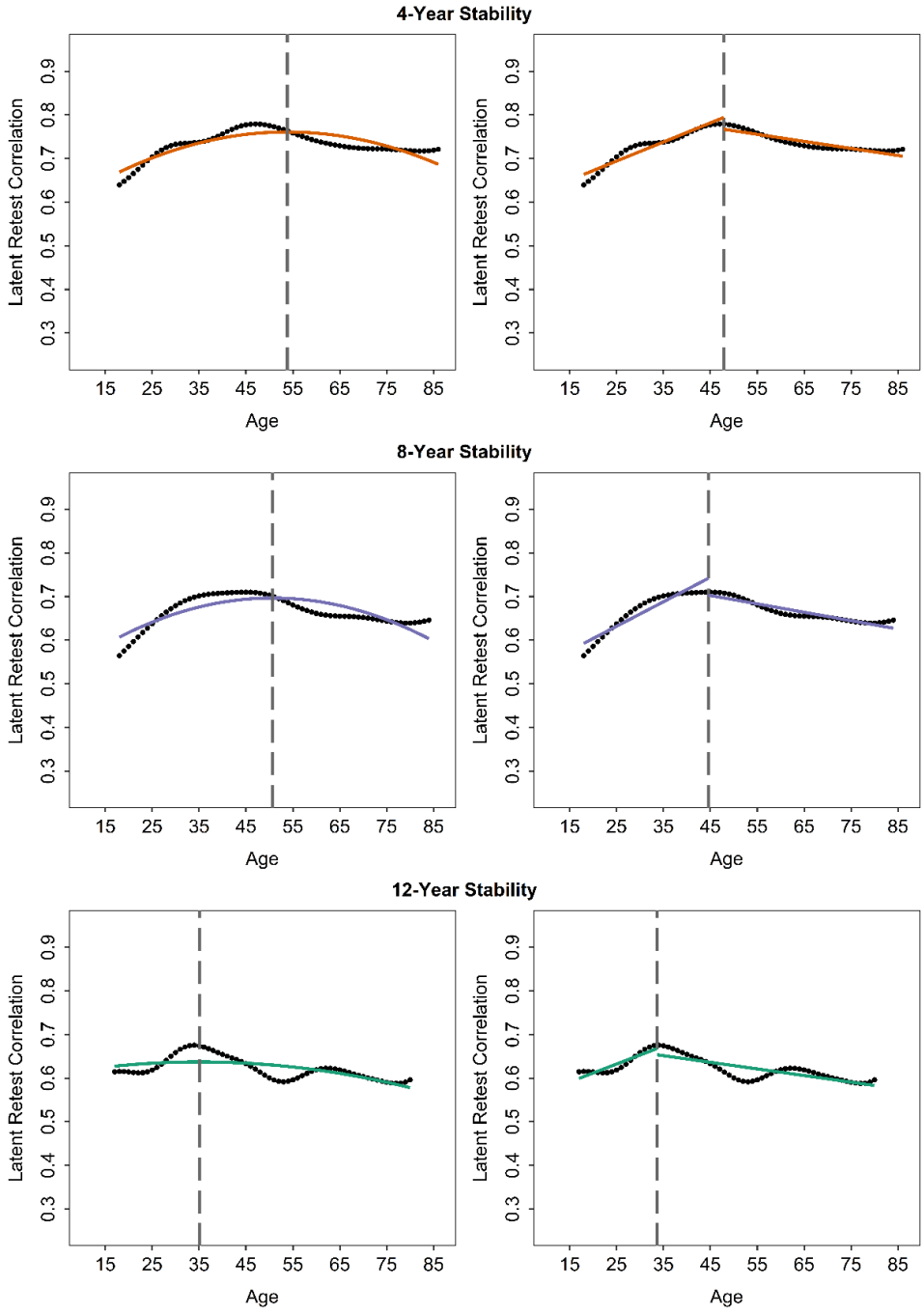
Regression Model (Left Column) and Two-Lines Test (Right Column) for the Stabilities for Agreeableness in the Socio-Economic Panel



Note. The dashed vertical line indicates the highest point in the quadratic function (left column) or the break point in the two-lines test (right column).

Figure S10

Regression Model (Left Column) and Two-Lines Test (Right Column) for the Stabilities for Openness in the Socio-Economic Panel



Note. The dashed vertical line indicates the highest point in the quadratic function (left column) or the break point in the two-lines test (right column).

Table S20

Parameters in the Regression Models for Describing the Development of Rank-Order Stability by Age in the Socio-Economic Panel

Model	b_0			b_1			b_2		
	Estimate	*t*	*p*	Estimate	*t*	*p*	Estimate	*t*	*p*
				Neuroticism					
4-year stability									
Intercept	0.7597	231.09	< .001						
Linear	0.7107	106.01	< .001	0.0010	7.81	< .001			
Exponential	0.7742	849.74	< .001	–1.1338	–7.24	< .001	–0.1261	–18.83	< .001
Quadratic	0.5999	70.32	< .001	0.0060	16.56	< .001	< –.0001	–14.13	< .001
8-year stability									
Intercept	0.7013	134.57	< .001						
Linear	0.6430	50.90	< .001	0.0011	4.93	< .001			
Exponential	0.7213	300.87	< .001	–2.5875	–3.46	.001	–0.1470	–10.35	< .001
Quadratic	0.4231	32.04	< .001	0.0112	19.86	< .001	–0.0001	–18.09	< .001
12-year stability									
Intercept	0.6519	90.50	< .001						
Linear	0.5941	31.56	< .001	0.0012	3.29	.002			
Exponential	0.6728	114.24	< .001	–3.7559	–1.41	.164	–0.1699	–4.55	< .001
Quadratic	0.3440	10.23	< .001	0.0133	8.75	< .001	–0.0001	–8.08	< .001
				Extraversion					
4-year stability									
Intercept	0.7625	127.21	< .001						
Linear	0.8218	54.79	< .001	–0.0011	–4.23	< .001			
Exponential	0.7861	178.06	< .001	< –.0001	–0.61	.541	0.1214	6.24	< .001
Quadratic	0.5427	66.35	< .001	0.0114	33.29	< .001	–0.0001	–37.14	< .001
8-year stability									
Intercept	0.7166	80.80	< .001						
Linear	0.8547	49.38	< .001	–0.0027	–8.53	< .001			
Exponential	0.7645	193.27	< .001	–0.0001	–1.72	.091	0.0922	12.93	< .001
Quadratic	0.5342	51.45	< .001	0.0120	26.96	< .001	–0.0001	–33.53	< .001
12-year stability									
Intercept	0.6801	122.13	< .001						
Linear	0.7593	65.86	< .001	–0.0016	–7.35	< .001			
Exponential	0.7107	160.76	< .001	–0.0002	–1.09	.278	0.0839	7.16	< .001
Quadratic	0.5616	50.90	< .001	0.0079	15.91	< .001	–0.0001	–19.47	< .001

Model	b_0			b_1			b_2		
	Estimate	*t*	*p*	Estimate	*t*	*p*	Estimate	*t*	*p*
				Conscientiousness					
4-year stability									
Intercept	0.6504	190.80	< .001						
Linear	0.6422	67.31	< .001	0.0002	0.92	.360			
Exponential	0.6570	194.34	< .001	< –.0001	–0.16	.871	0.1997	2.75	.008
Quadratic	0.4774	46.47	< .001	0.0076	17.57	< .001	–0.0001	–17.45	< .001
8-year stability									
Intercept	0.5831	120.82	< .001						
Linear	0.5696	41.89	< .001	0.0003	1.06	.291			
Exponential	0.5964	124.92	< .001	–1.6427	–1.16	.251	–0.1453	–3.42	.001
Quadratic	0.3361	22.15	< .001	0.0110	16.89	< .001	–0.0001	–16.71	< .001
12-year stability									
Intercept	0.5176	52.59	< .001						
Linear	0.5525	20.11	< .001	–0.0007	–1.36	.179			
Exponential	0.5448	55.84	< .001	< –.0001	–0.29	.769	0.1477	3.40	.001
Quadratic	0.0554	3.90	< .001	0.0233	36.42	< .001	–0.0002	–38.09	< .001
				Agreeableness					
4-year stability									
Intercept	0.6969	140.82	< .001						
Linear	0.6956	49.91	< .001	< .0001	0.09	.926			
Exponential	0.7080	150.14	< .001	–3.4957	–0.88	.380	–0.1832	–3.23	.002
Quadratic	0.4432	40.26	< .001	0.0114	24.65	< .001	–0.0001	–24.96	< .001
8-year stability									
Intercept	0.6385	135.33	< .001						
Linear	0.6279	47.09	< .001	0.0002	0.85	.398			
Exponential	0.6508	168.88	< .001	–4.5061	–1.15	.254	–0.1915	–4.37	< .001
Quadratic	0.3927	30.33	< .001	0.0110	19.83	< .001	–0.0001	–19.74	< .001
12-year stability									
Intercept	0.5882	98.59	< .001						
Linear	0.6989	91.07	< .001	–0.0023	–15.44	< .001			
Exponential	0.6325	176.47	< .001	–0.0012	–2.47	.016	0.0626	12.24	< .001
Quadratic	0.5981	43.12	< .001	0.0026	4.13	< .001	–0.0001	–7.90	< .001

Model	b_0			b_1			b_2		
	Estimate	*t*	*p*	Estimate	*t*	*p*	Estimate	*t*	*p*
				Openness					
4-year stability									
Intercept	0.7322	199.28	< .001						
Linear	0.7185	70.49	< .001	0.0003	1.43	.156			
Exponential	0.7423	261.04	< .001	–3.3268	–1.32	.192	–0.1854	–4.87	< .001
Quadratic	0.5531	40.62	< .001	0.0077	13.49	< .001	–0.0001	–13.22	< .001
8-year stability									
Intercept	0.6651	155.84	< .001						
Linear	0.6679	55.08	< .001	–0.0001	–0.24	.812			
Exponential	0.6745	187.53	< .001	–8.3230	–0.85	.397	–0.2313	–3.84	< .001
Quadratic	0.4806	26.23	< .001	0.0085	10.88	< .001	–0.0001	–11.10	< .001
12-year stability									
Intercept	0.6219	192.71	< .001						
Linear	0.6599	87.51	< .001	–0.0008	–5.39	< .001			
Exponential	0.6446	51.26	< .001	–0.0026	–0.53	.600	0.0398	1.76	.084
Quadratic	0.6009	34.22	< .001	0.0021	2.61	.011	< –.0001	–3.65	< .001
				Mean stabilities					
4-year stability									
Intercept	0.7210	196.50	< .001						
Linear	0.7156	69.10	< .001	0.0001	0.56	.575			
Exponential	0.7301	219.56	< .001	–2.5438	–1.03	.308	–0.1790	–3.67	< .001
Quadratic	0.5207	128.90	< .001	0.0090	52.33	< .001	–0.0001	–52.46	< .001
8-year stability									
Intercept	0.6609	142.12	< .001						
Linear	0.6726	51.24	< .001	–0.0002	–0.95	.345			
Exponential	0.6700	151.65	< .001	–6.1594	–0.69	.492	–0.2190	–2.97	.004
Quadratic	0.4333	44.39	< .001	0.0107	25.70	< .001	–0.0001	–26.62	< .001
12-year stability									
Intercept	0.6119	128.03	< .001						
Linear	0.6529	52.93	< .001	–0.0008	–3.56	< .001			
Exponential	0.6288	169.01	< .001	< –.0001	–0.50	.620	0.1389	5.40	< .001
Quadratic	0.4320	55.55	< .001	0.0098	28.03	< .001	–0.0001	–30.88	< .001

Note. Intercept model: $stability_i = b_0 + e_i$. Linear model: $stability_i = b_0 + b_1 age_i + e_i$. Exponential model: $stability_i = b_0 + b_1 \exp(b_2 age_i) + e_i$. Quadratic model: $stability_i = b_0 + b_1 age_i + b_2 age_i^2 + e_i$.

Table S21

Parameters in the Two-Lines Tests for Describing the Development of Rank-Order Stability by Age in the Socio-Economic Panel

Model	b_0	b_1	*BP*	b_2	b_3
			Neuroticism		
4-year stability					
Estimate	0.7967	0.0016	70.05	–0.0020	–0.0092
z	192.15	7.40		–7.48	–2.07
p	< .001	< .001		< .001	.038
8-year stability					
Estimate	0.7631	0.0025	67.63	–0.0040	–0.0222
z	93.84	6.70		–11.43	–2.60
p	< .001	< .001		< .001	.009
12-year stability					
Estimate	0.7140	0.0025	67.60	–0.0151	0.0383
z	67.36	5.29		–7.99	2.25
p	< .001	< .001		< .001	.025
			Extraversion		
4-year stability					
Estimate	0.8352	0.0039	46.60	–0.0043	0.0022
z	122.15	8.21		–12.39	0.24
p	< .001	< .001		< .001	.813
8-year stability					
Estimate	0.7982	0.0070	32.50	–0.0047	0.0321
z	150.70	11.60		–11.41	2.90
p	< .001	< .001		< .001	.004
12-year stability					
Estimate	0.7285	0.0018	45.00	–0.0048	0.0205
z	167.52	6.61		–69.90	4.03
p	< .001	< .001		< .001	< .001

Model	b_0	b_1	*BP*	b_2	b_3
			Conscientiousness		
4-year stability					
Estimate	0.6892	0.0020	56.82	–0.0034	0.0124
z	267.49	16.47		–11.90	2.31
p	< .001	< .001		< .001	.021
8-year stability					
Estimate	0.6417	0.0068	40.58	–0.0022	0.0004
z	147.62	16.17		–18.06	0.07
p	< .001	< .001		< .001	.947
12-year stability					
Estimate	0.6205	0.0094	40.89	–0.0068	0.0391
z	103.11	16.61		–14.04	3.14
p	< .001	< .001		< .001	.002
			Agreeableness		
4-year stability					
Estimate	0.7698	0.0039	53.51	–0.0038	–0.0136
z	160.93	12.98		–13.66	–2.41
p	< .001	< .001		< .001	.016
8-year stability					
Estimate	0.7091	0.0047	48.49	–0.0025	–0.0231
z	83.86	9.62		–28.90	–2.66
p	< .001	< .001		< .001	.008
12-year stability					
Estimate	0.6200	–0.0076	24.00	–0.0023	0.0254
z	900.97	–27.15		–9.69	3.98
p	< .001	< .001		< .001	< .001

Model	b_0	b_1	*BP*	b_2	b_3
		Openness			
4-year stability					
Estimate	0.7943	0.0044	47.87	–0.0016	–0.0272
z	229.52	15.04		–11.40	–5.83
p	< .001	< .001		< .001	< .001
8-year stability					
Estimate	0.7416	0.0056	44.57	–0.0019	–0.0385
z	93.61	10.64		–13.84	–4.51
p	< .001	< .001		< .001	< .001
12-year stability					
Estimate	0.6679	0.0041	33.60	–0.0015	–0.0143
z	124.34	6.76		–10.06	–1.91
p	< .001	< .001		< .001	.057
		Mean stabilities			
4-year stability					
Estimate	0.7745	0.0035	49.73	–0.0024	–0.0082
z	167.37	12.36		–16.73	–1.52
p	< .001	< .001		< .001	.128
8-year stability					
Estimate	0.7322	0.0051	45.36	–0.0028	–0.0160
z	95.91	10.86		–24.19	–2.00
p	< .001	< .001		< .001	.045
12-year stability					
Estimate	0.6719	0.0039	42.31	–0.0035	0.0011
z	274.10	28.07		–12.53	0.23
p	< .001	< .001		< .001	.822

Note. BP = break point. Regression model for the two-lines test: $stability_i = b_0 + b_1 age_{i(\text{low})} + b_2 age_{i(\text{high})} + b_3 high + e_i$. Where $age_{i(\text{low})} = age_i - BP$ if $age_i < BP$ and 0 otherwise, $age_{i(\text{high})} = age_i - BP$ if $age_i \geq BP$ and 0 otherwise, and $high = 1$ if $age_i \geq BP$ and 0 otherwise.

Manifest Analyses

To gauge the robustness of our main results, we ran similar analyses on the manifest level to examine the influence of age on personality stability. The methodological decisions were made so that they would resemble those in the latent analyses as much as possible. That is, we once again set the eligibility criteria for participants in our analyses to be as inclusive as possible. We included all participants who responded in at least two waves to at least one item from the respective Big Five domain. To obtain stable estimates, we only calculated correlations when data from at least $n = 10$ participants were available, and we further limited the age selection so that every age cell within the age range included at least $n = 10$ participants.

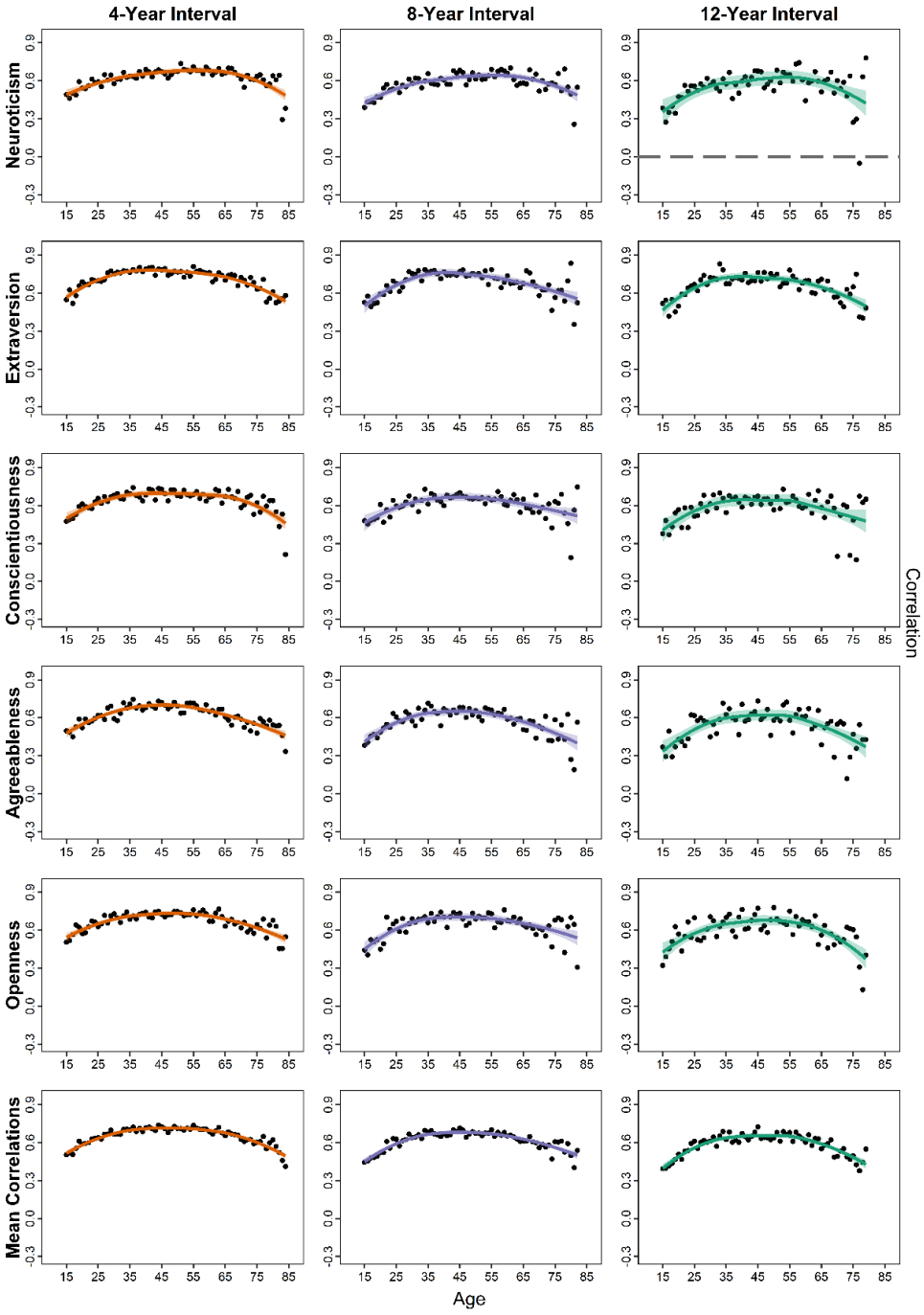
We used the same items as in the latent analyses. For each participant who was included, we computed the average across the items they answered in the corresponding wave. Separated by age at the first of the two time points, the correlations across all measurement waves for these mean scores were estimated. Thus, per Big Five personality factor, three 4-year correlations (2005 to 2009, 2009 to 2013, and 2013 to 2017), two 8-year correlations (2005 to 2013 and 2009 to 2017), and one 12-year correlation (2005 to 2017) were estimated.

The rank-order correlations from the same time interval (i.e., three 4-year stabilities and two 8-year stabilities) were averaged for each year of age. In addition to considering each of the Big Five in isolation, we also averaged their respective manifest rank-order correlations for each year of age to arrive at a measure of the mean correlation. The results for HILDA are depicted in Figure S11 and for the SOEP in Figure S12. We used locally estimated scatterplot smoothing (LOESS) to obtain a smoothed regression line for describing the shape of the stability correlations across age.

Stability increased with age (until roughly 50 years of age) and declined afterwards, confirming the inverted U-shape of personality stability across the life span. This age trend was clearly visible in HILDA. In the SOEP, however, this pattern seemed to be less pronounced. For example, the smoothed line indicated no decrease in stability for Neuroticism. But note that the averaged correlation estimates across the Big Five in the SOEP were similar to those obtained in the latent analyses: Here, an inverted U-shaped pattern was indicated. Taken together, the results of the manifest analyses were very much in line with those from the latent analyses reported in the main article.

Figure S11

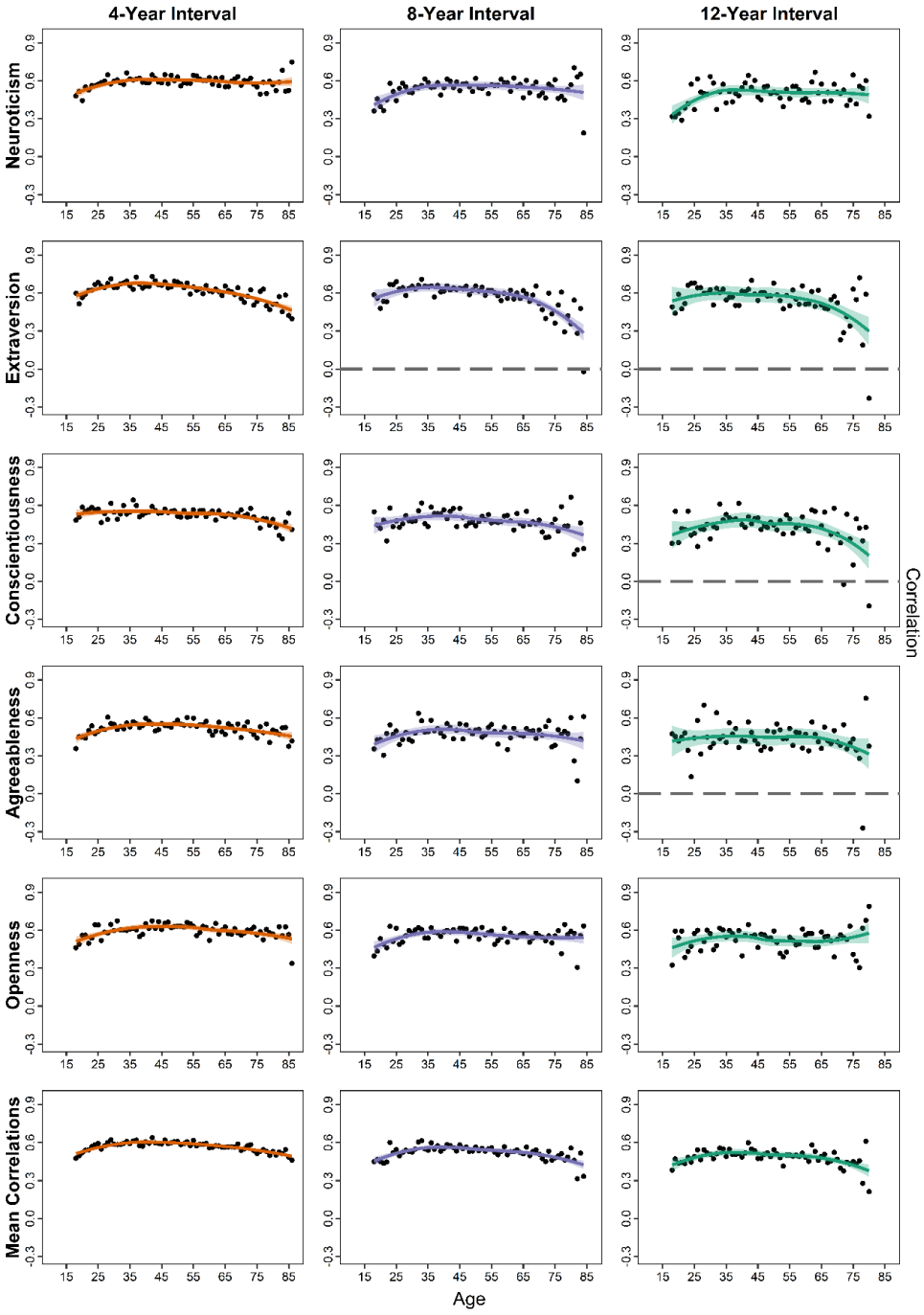
Correlations of the Big Five for the 4-, 8-, and 12-Year Intervals Across Age in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed horizontal line indicates that correlations lower than 0 occurred. Shaded areas represent the 95% confidence interval of the smoothed line.

Figure S12

Correlations of the Big Five for the 4-, 8-, and 12-Year Intervals Across Age in the Socio-Economic Panel



Note. The dashed horizontal line indicates that correlations lower than 0 occurred. Shaded areas represent the 95% confidence interval of the smoothed line.

Additional Analyses

Explaining Discrepancies Between Our and Recent Findings

The age trajectories in the rank-order stability of personality we produced offer a contrast with those found by Wagner et al. (2019) despite the methodological overlap (i.e., applying LSEM to HILDA and SOEP). To account for these disparities, we examined how results changed when we aligned the methodology used by Wagner et al. with our approach in a step-by-step manner. As a starting point, we tried to reproduce the developmental trajectories that Wagner et al. found for the single Big Five personality traits.

We built this initial statistical model on the methods applied by Wagner et al. (2019): For both HILDA and SOEP, we used the first three waves of personality data (i.e., 2005, 2009, and 2013). The same models were applied for each of the single Big Five personality traits and for each study. For each measurement point, there was one latent personality factor with three manifest indicators. In SOEP, the indicators were items (as listed in Table S14). In HILDA, as there were more than three items for each trait, the indicators were item parcels (J. Wagner, personal communication, June 11, 2019; see Table S22). The residual variances of each indicator were set to covary with the same indicator across time. By constraining the factor loadings of an indicator to equality across time, metric measurement invariance was established. Wagner et al. indicated that they "constrained the error variances to equality across time and age" (p. 669), but the equality constraint *across age* was impossible to implement in Version 1.14-10 of the R package sirt, which Wagner et al. used for their analyses.[2] Hence, the error variances of an indicator were set invariant *only across time*. All latent factors were allowed to covary with each

[2] Imposing invariance constraints across focal points (in this case: age) for a parameter in LSEM was introduced in Version 3.4 of sirt. Accordingly, Wagner et al. (2019) established metric measurement invariance only across time (and not additionally across age).

other. To obtain time-invariant 4-year correlations, all three factor variances (i.e., 2005, 2009, and 2013) and the two 4-year covariances (i.e., 2005–2009 and 2009–2013) were set equal. Participants were included in the analyses if they provided complete data for all personality traits in all three waves and if their age was within 18 to 80 in 2005. Accordingly, in LSEM, the focal points were ages 18 to 80 (a Gaussian kernel function with a bandwidth factor of $h = 2$ was used).

Table S22

Item Parcels for the Household, Income and Labour Dynamics in Australia Survey

Factor	Item		
	1	2	3
Neuroticism			
Parcel 1	Envious	Jealous	Calm [a]
Parcel 2	Moody	Temperamental	
Parcel 3	Touchy	Fretful	
Extraversion			
Parcel 1	Talkative	Extroverted	Enthusiastic
Parcel 2	Bashful [a]	Shy [a]	Lively
Parcel 3	Quiet [a]	Withdrawn [a]	
Conscientiousness			
Parcel 1	Orderly	Sloppy [a]	Careless [a]
Parcel 2	Systematic	Disorganised [a]	
Parcel 3	Inefficient [a]	Efficient	
Agreeableness			
Parcel 1	Sympathetic	Cooperative	Selfish [a]
Parcel 2	Harsh [a]	Cold [a]	
Parcel 3	Kind	Warm	
Openness [b]			
Parcel 1	Deep	Intellectual	
Parcel 2	Philosophical	Complex	
Parcel 3	Creative	Imaginative	

Note. Items within a parcel were averaged.

[a] Reversed item. [b] The item "Traditional" was excluded due to unfavorable psychometric features.

In both HILDA and SOEP, we fixed the residual covariances of one of the Agreeableness indicators to 0 to avoid having nonpositive definite residual covariance matrices and negative estimated variances. With a sample size of n = 9,014 in SOEP, we included a single participant more than Wagner et al. (2019) did, which might be due to using a different version of the respective data set. As Figure S13 highlights, these deviations had virtually no impact on our ability to successfully reproduce the age trajectories of interest (see Wagner et al., 2019, Figure 2). Table S23 presents the steps we applied to align the methodology used by Wagner et al. with our approach. The corresponding changes in the 4-year stabilities for the Big Five dimensions and the average stabilities are shown for HILDA in Figures S14 to S19 and for SOEP in Figures S20 to S25.

Figure S13

Replicating the 4-Year Rank-Order Stabilities of the Big Five Reported by Wagner et al. (2019) for the Household, Income and Labour Dynamics in Australia Survey (Left Side) and the Socio-Economic Panel (Right Side)

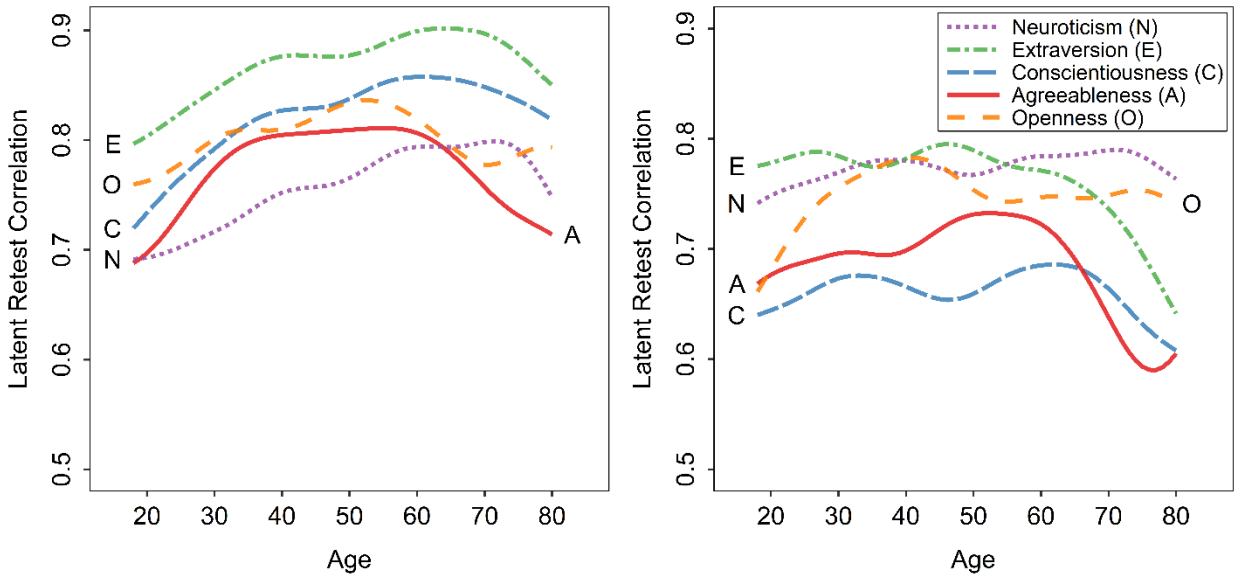


Table S23

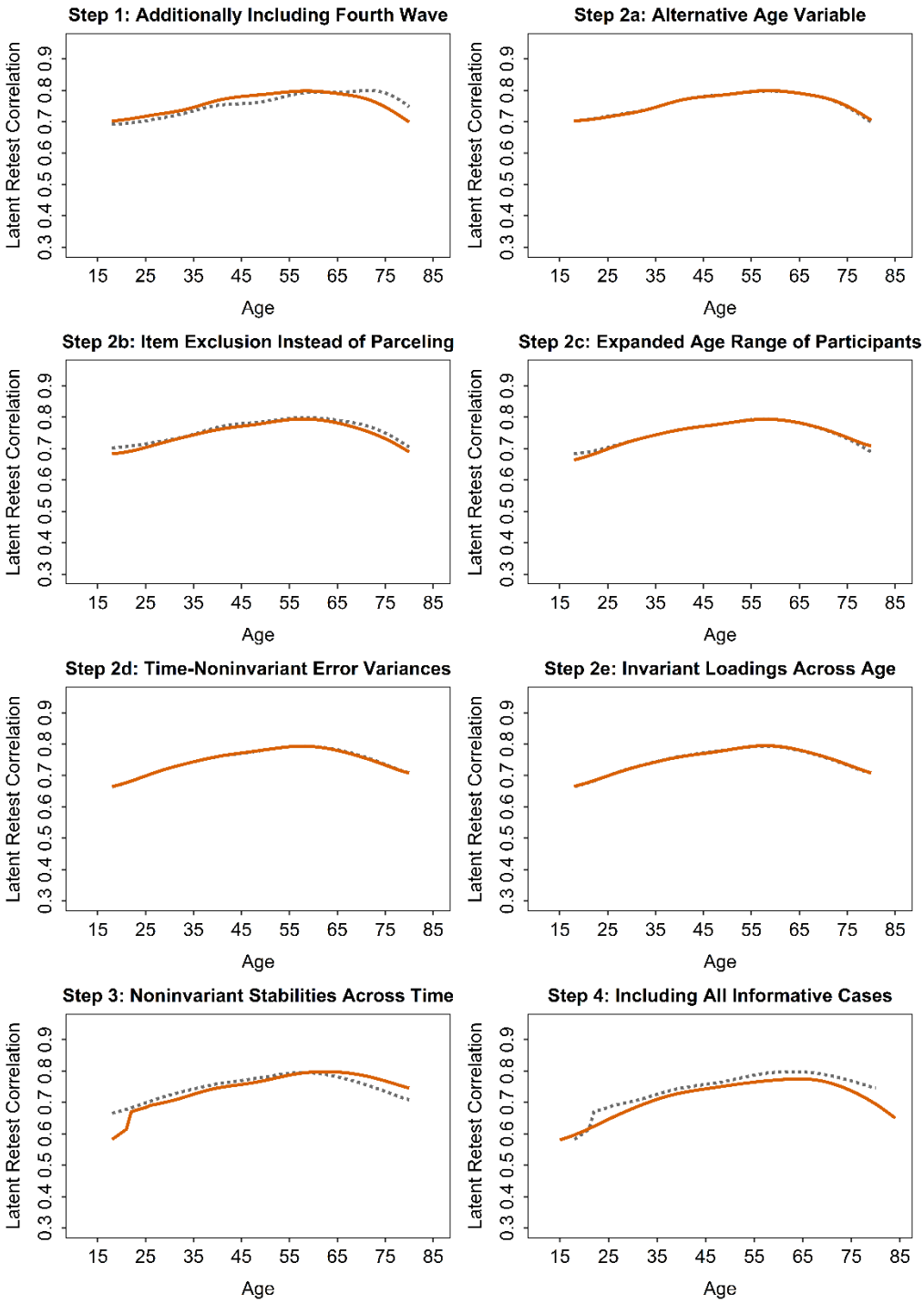
How Our Methodology Compared With the Methodology Used by Wagner et al. (2019)

Step	Wagner et al. (2019)	The current study
1	Three waves (4-year retest)	Four waves (one additional 4-year retest) [a]
2		
a [b]	Age at reference date	Age at date of interview
b [b]	Item parceling	Single items as indicators [c]
c	Ages outside 18–80 excluded	Ages outside 18–80 included [d]
d	Invariant error variances across time	Noninvariant error variances across time
e	Invariant factor loadings across time	Invariant factor loadings across time and age
3	Invariant stabilities across time [e]	Noninvariant stabilities across time [f]
4	Only complete cases included	All informative cases included

[a] Requiring all-trait complete data was relaxed to trait-wise completeness. [b] Applies only to the Household, Income and Labour Dynamics in Australia Survey. [c] Some items were excluded to improve model fit (for details, see Table S2). [d] Without stability estimates but informative for adjoining ages. [e] Implies invariant factor variances and covariances across time. [f] The two 4-year rank-order age curves (i.e., 2005–2009 and 2009–2013) were averaged, adjusting for age.

Figure S14

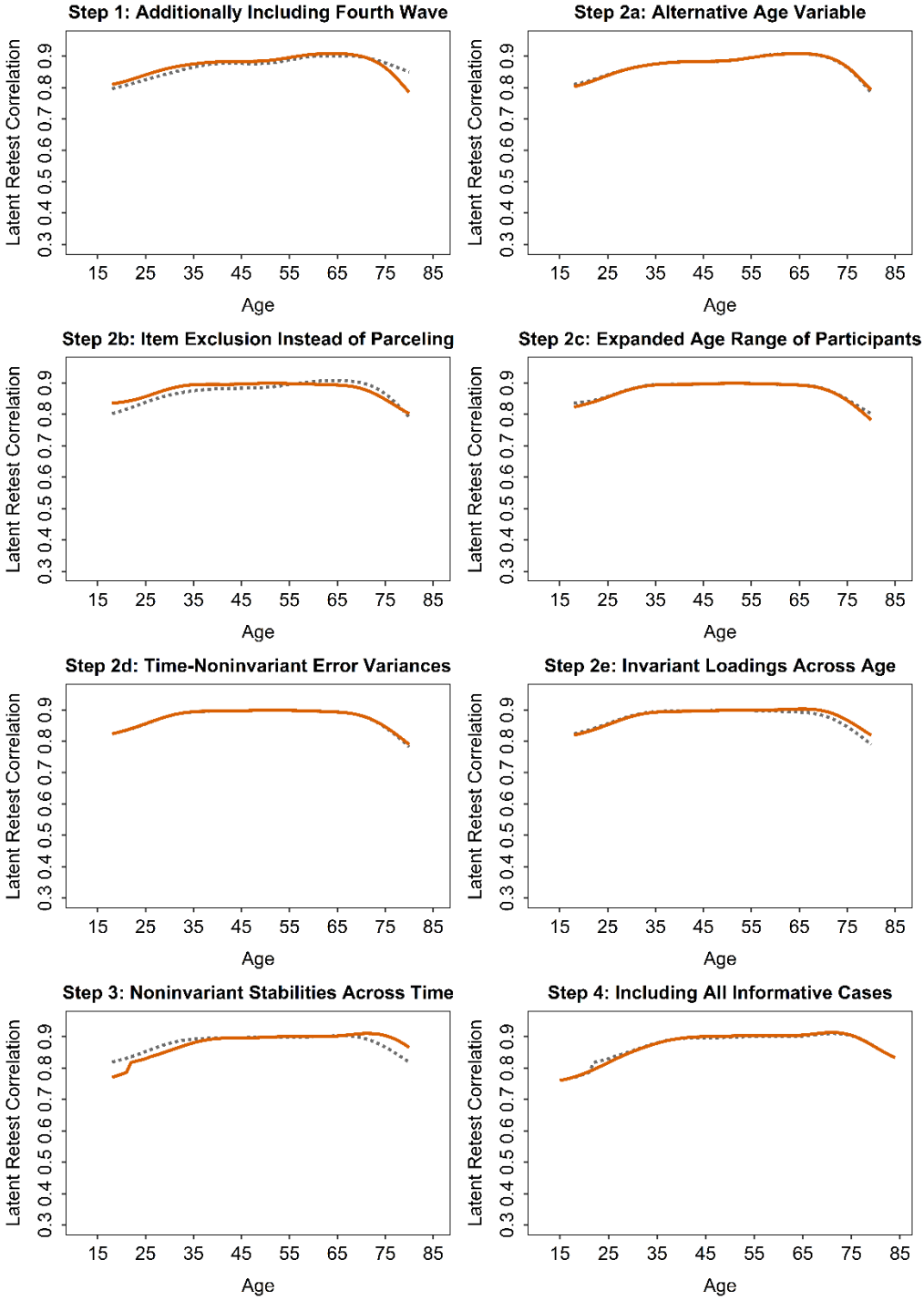
Impact of Methodological Changes (see Table S23) on the 4-Year Rank-Order Stabilities of Neuroticism in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed line indicates the trajectory of the respective previous step.

Figure S15

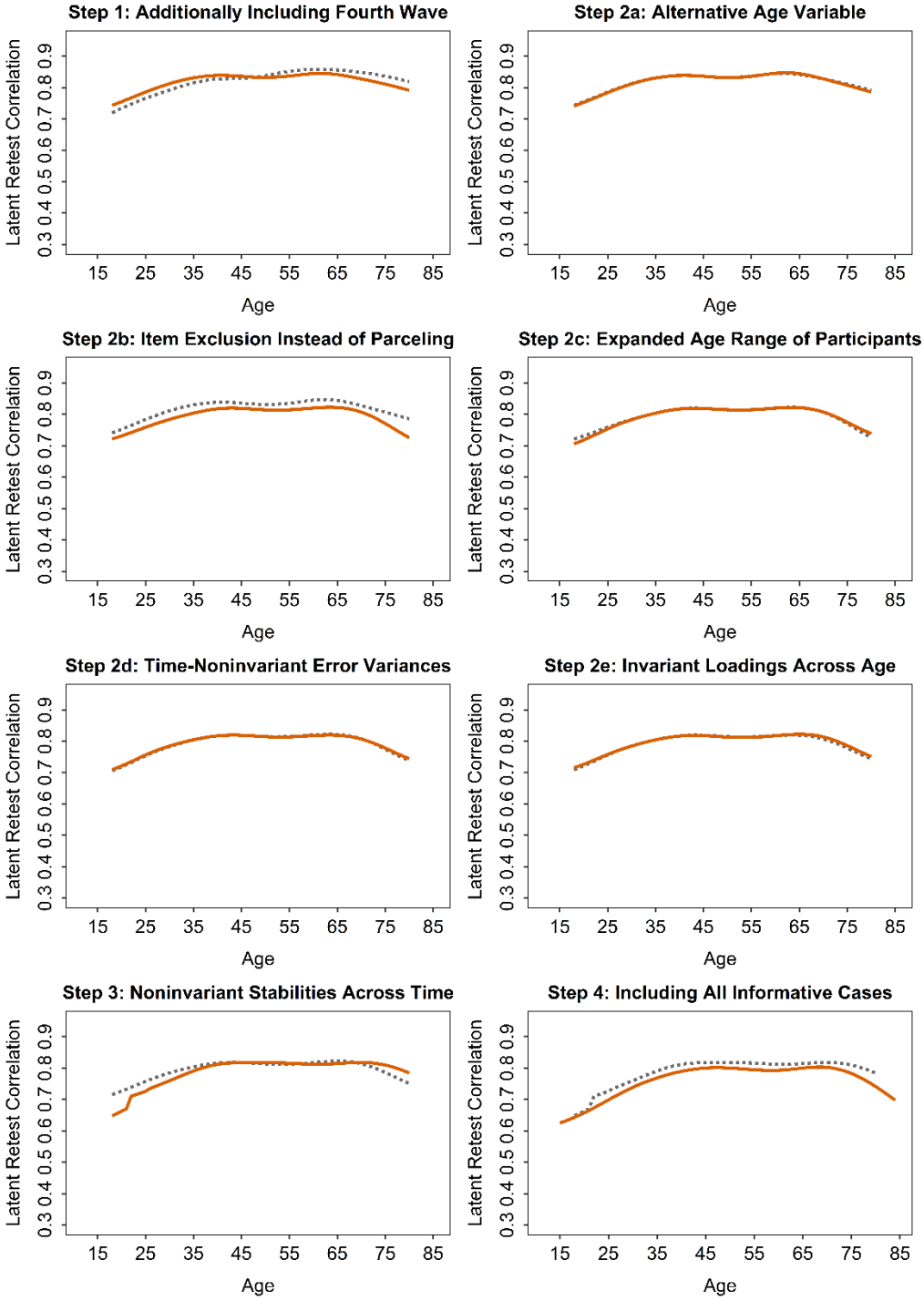
Impact of Methodological Changes (see Table S23) on the 4-Year Rank-Order Stabilities of Extraversion in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed line indicates the trajectory of the respective previous step.

Figure S16

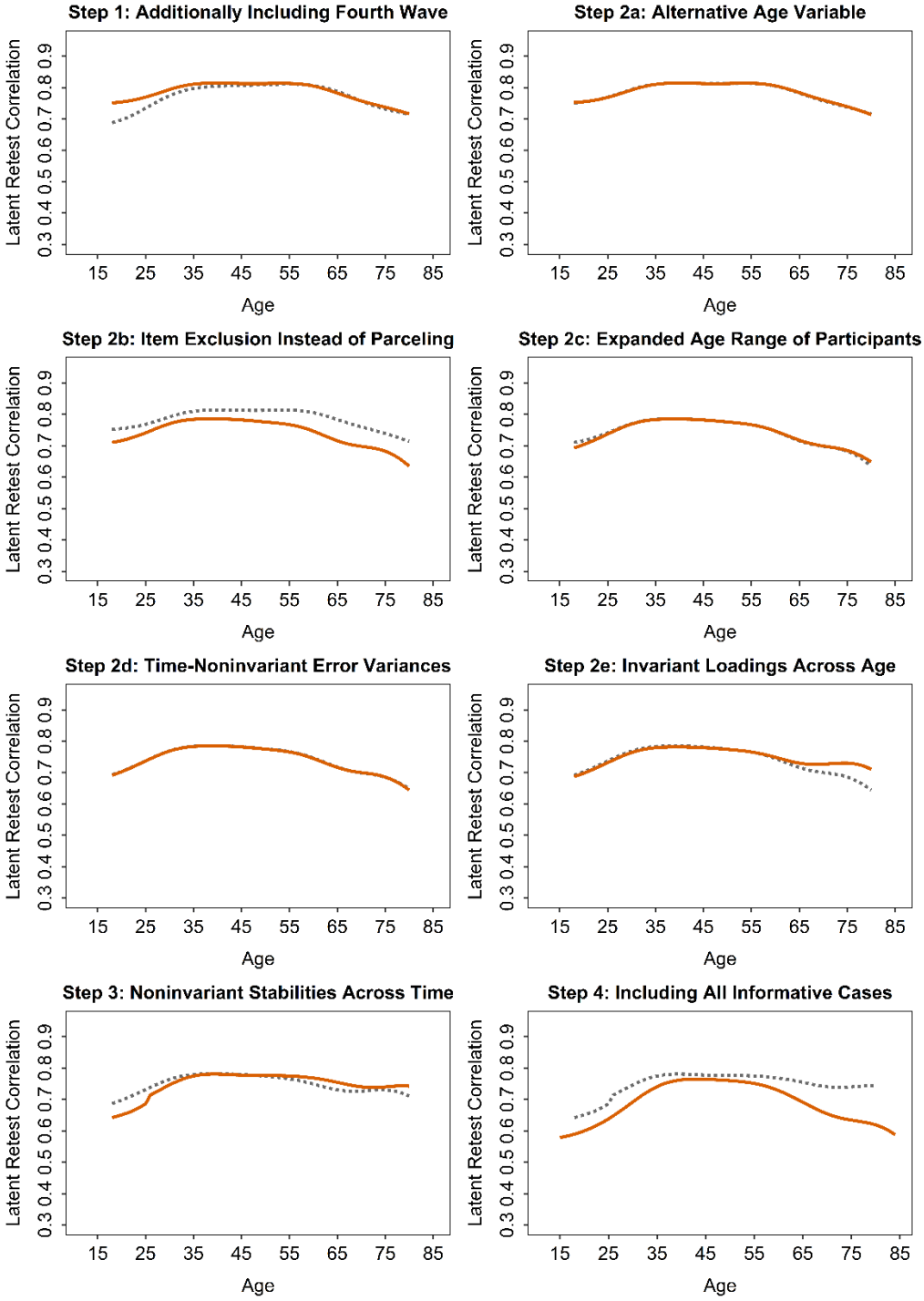
Impact of Methodological Changes (see Table S23) on the 4-Year Rank-Order Stabilities of Conscientiousness in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed line indicates the trajectory of the respective previous step.

Figure S17

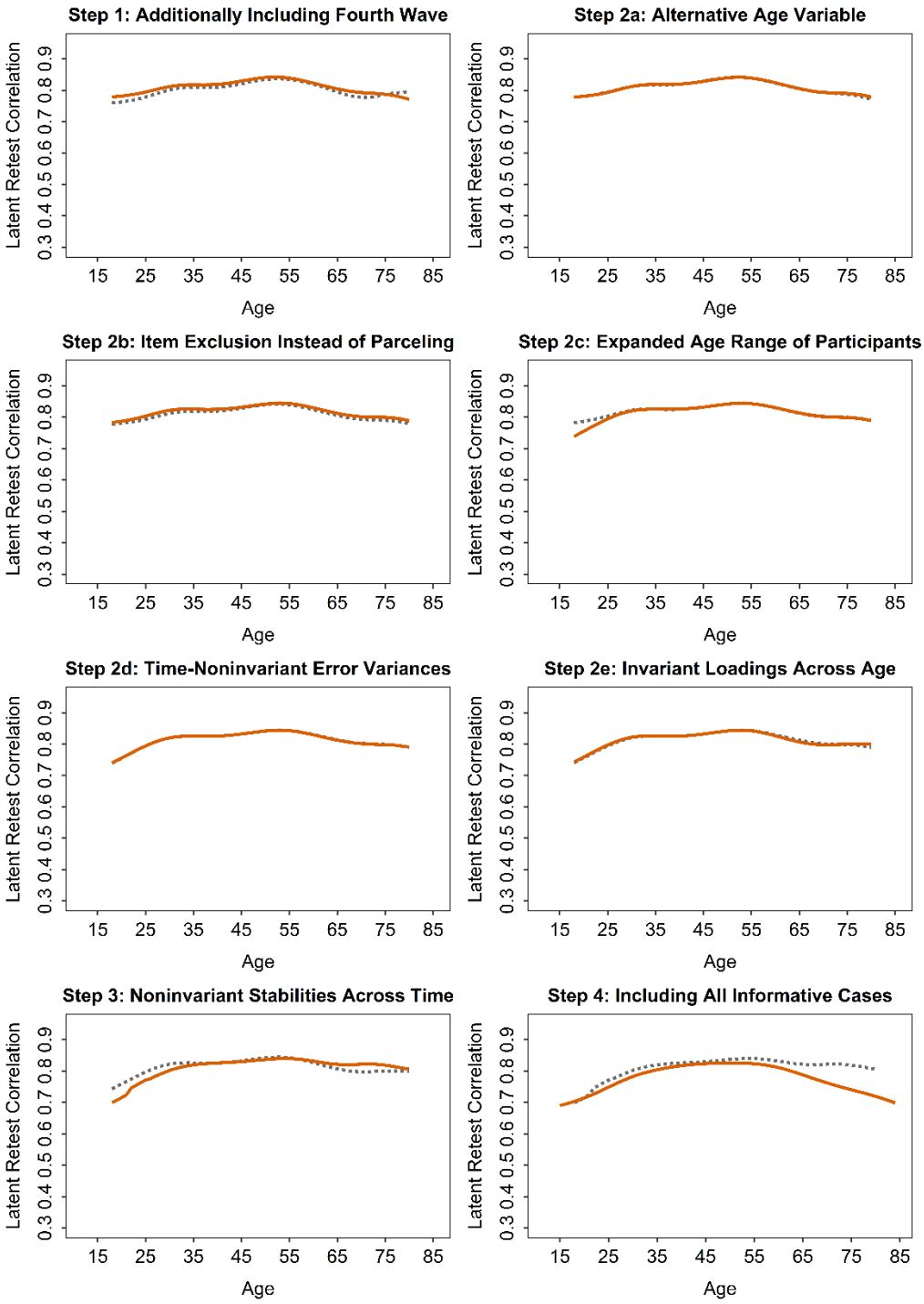
Impact of Methodological Changes (see Table S23) on the 4-Year Rank-Order Stabilities of Agreeableness in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed line indicates the trajectory of the respective previous step.

Figure S18

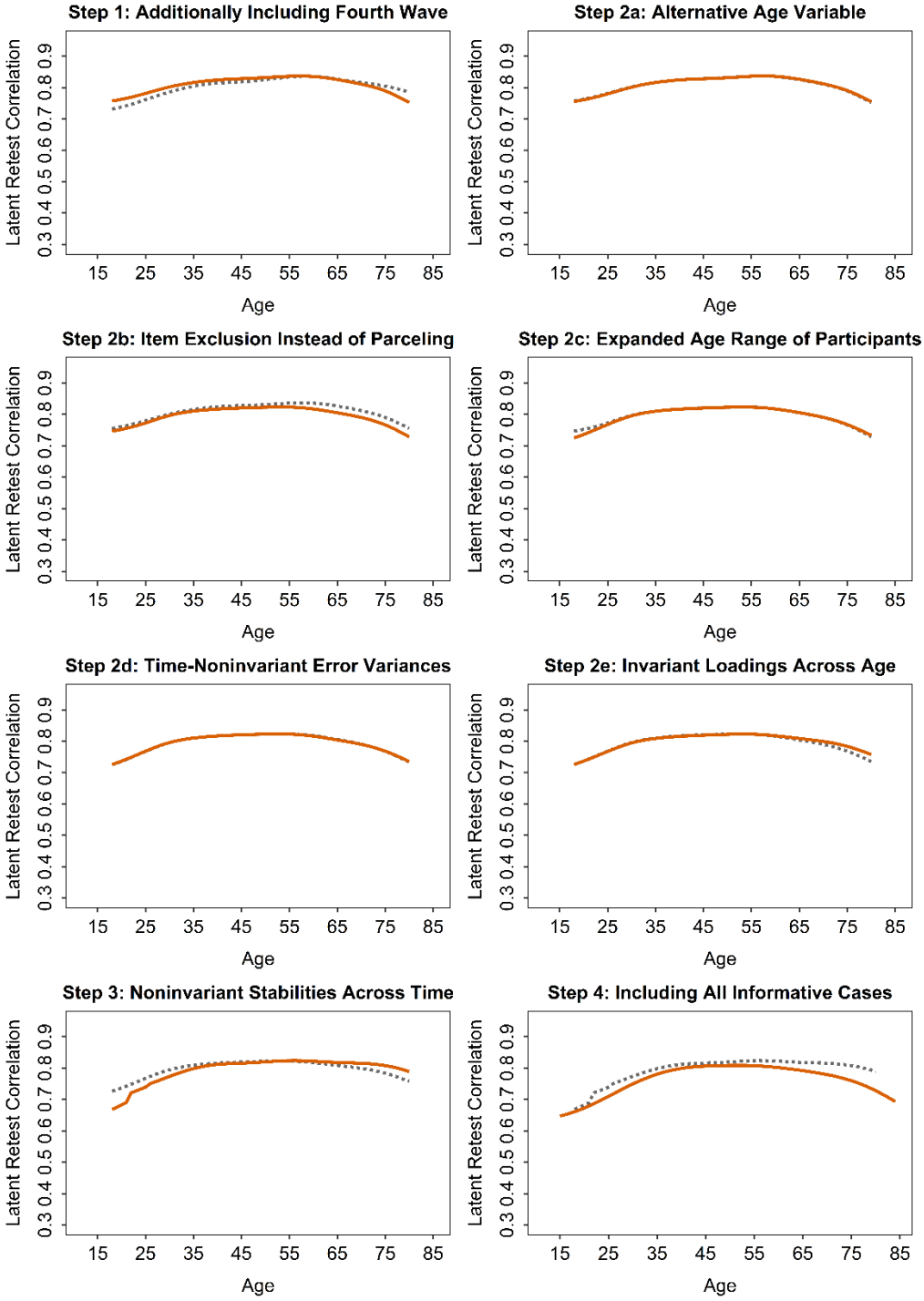
Impact of Methodological Changes (see Table S23) on the 4-Year Rank-Order Stabilities of Openness in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed line indicates the trajectory of the respective previous step.

Figure S19

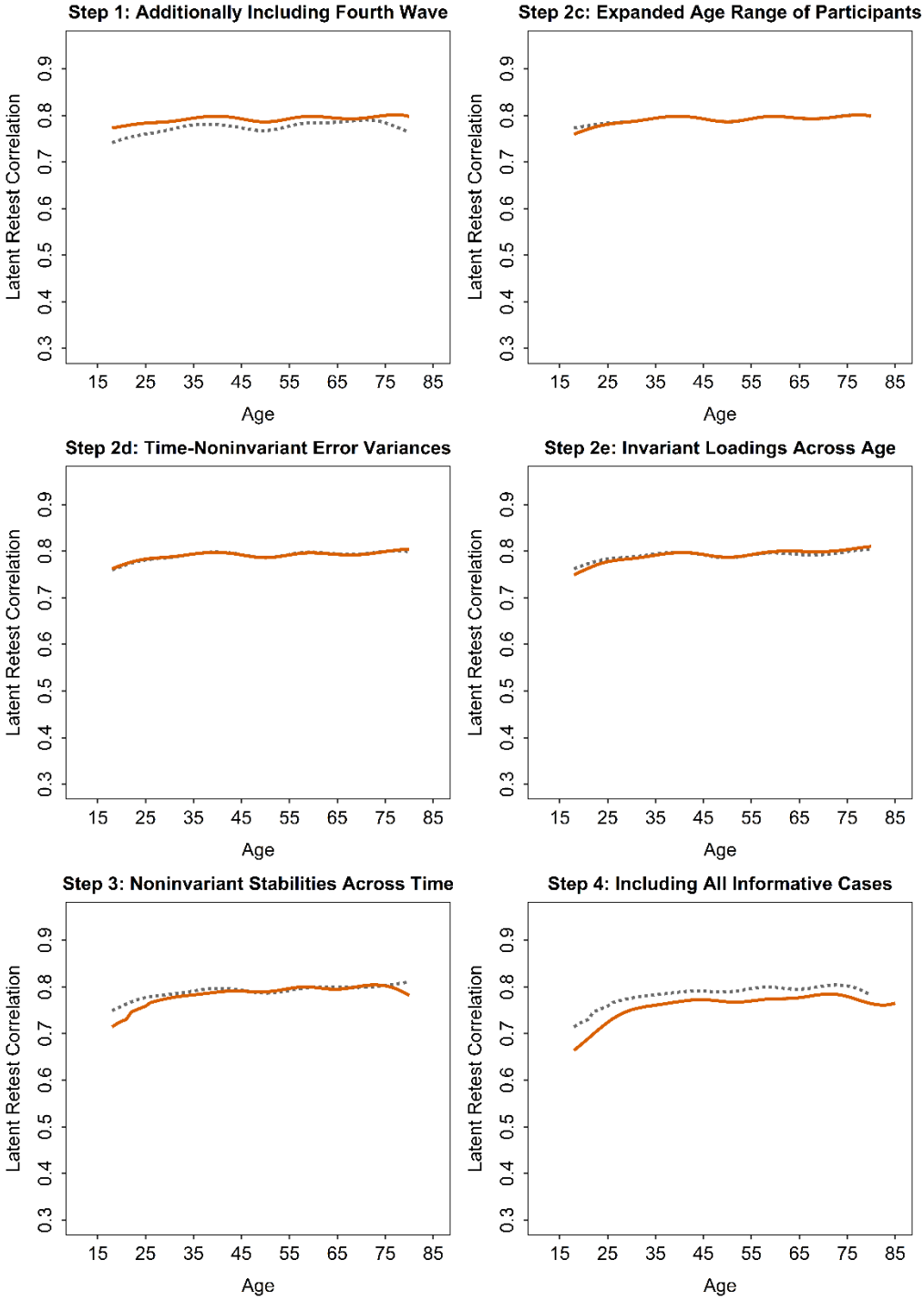
Impact of Methodological Changes (see Table S23) on the Mean 4-Year Rank-Order Stabilities in the Household, Income and Labour Dynamics in Australia Survey



Note. The dashed line indicates the trajectory of the respective previous step.

Figure S20

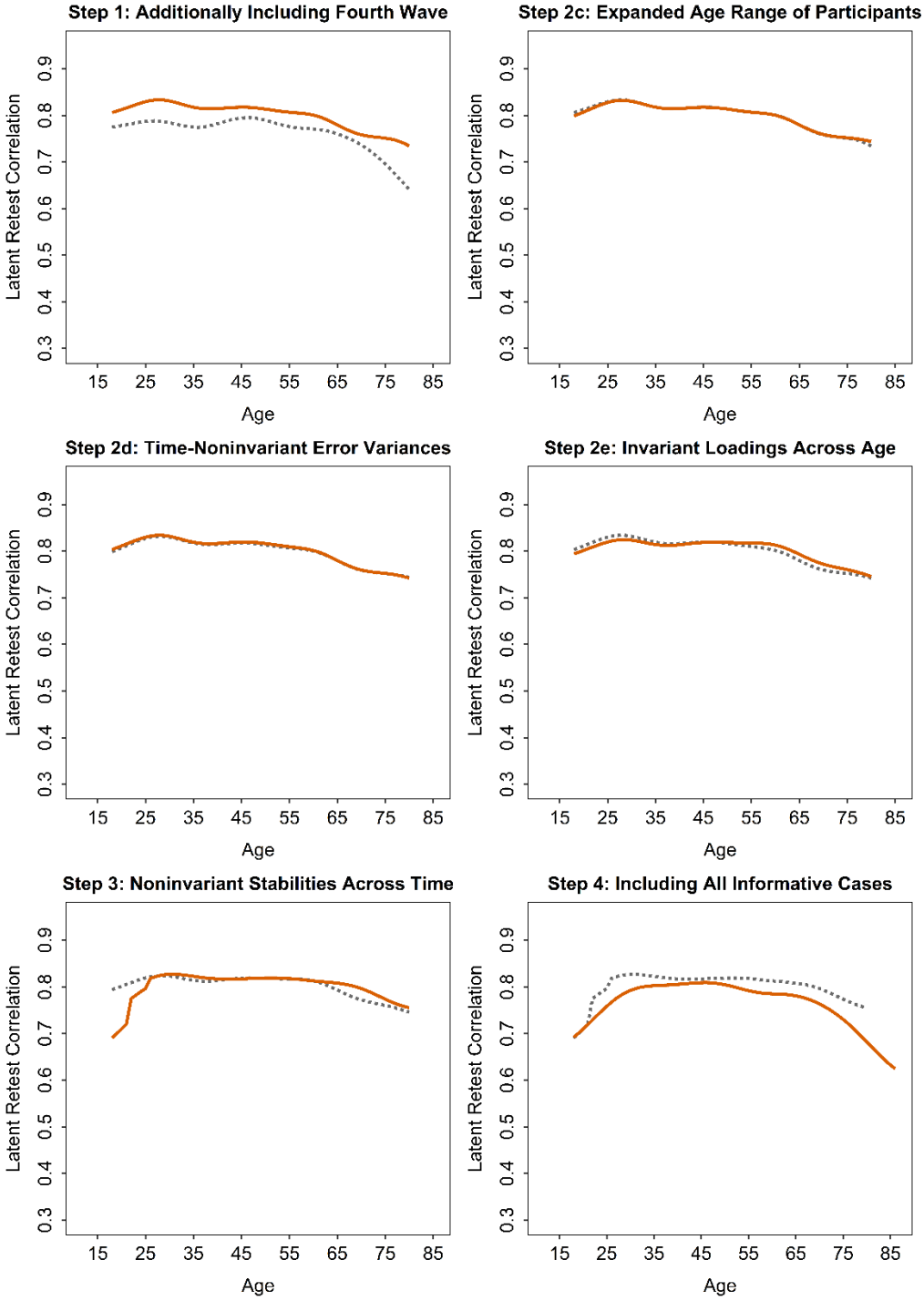
Impact of Methodological Changes (see Table S23) on the 4-Year Rank-Order Stabilities of Neuroticism in the Socio-Economic Panel



Note. The dashed line indicates the trajectory of the respective previous step.

Figure S21

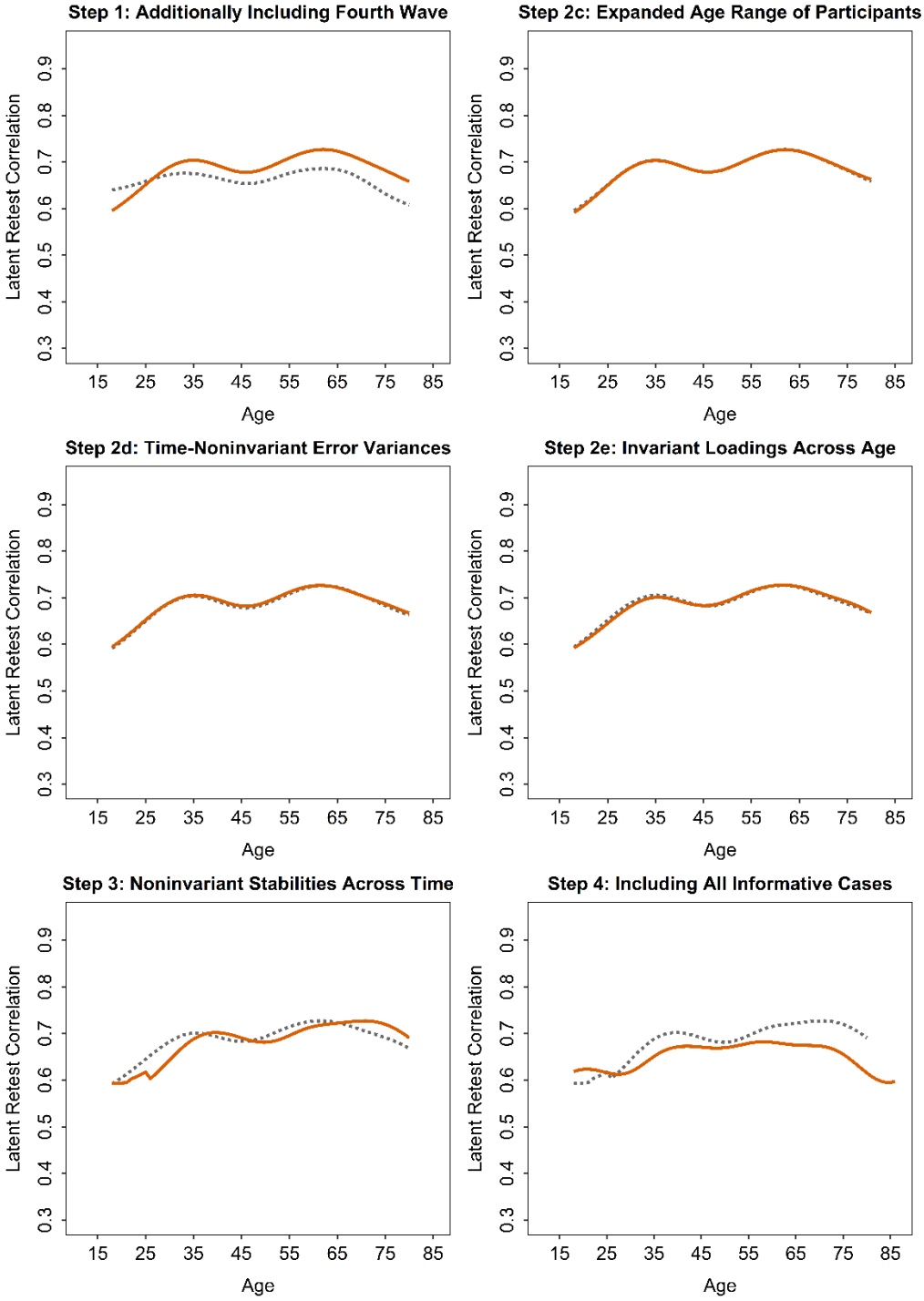
Impact of Methodological Changes (see Table S23) on the 4-Year Rank-Order Stabilities of Extraversion in the Socio-Economic Panel



Note. The dashed line indicates the trajectory of the respective previous step.

Figure S22

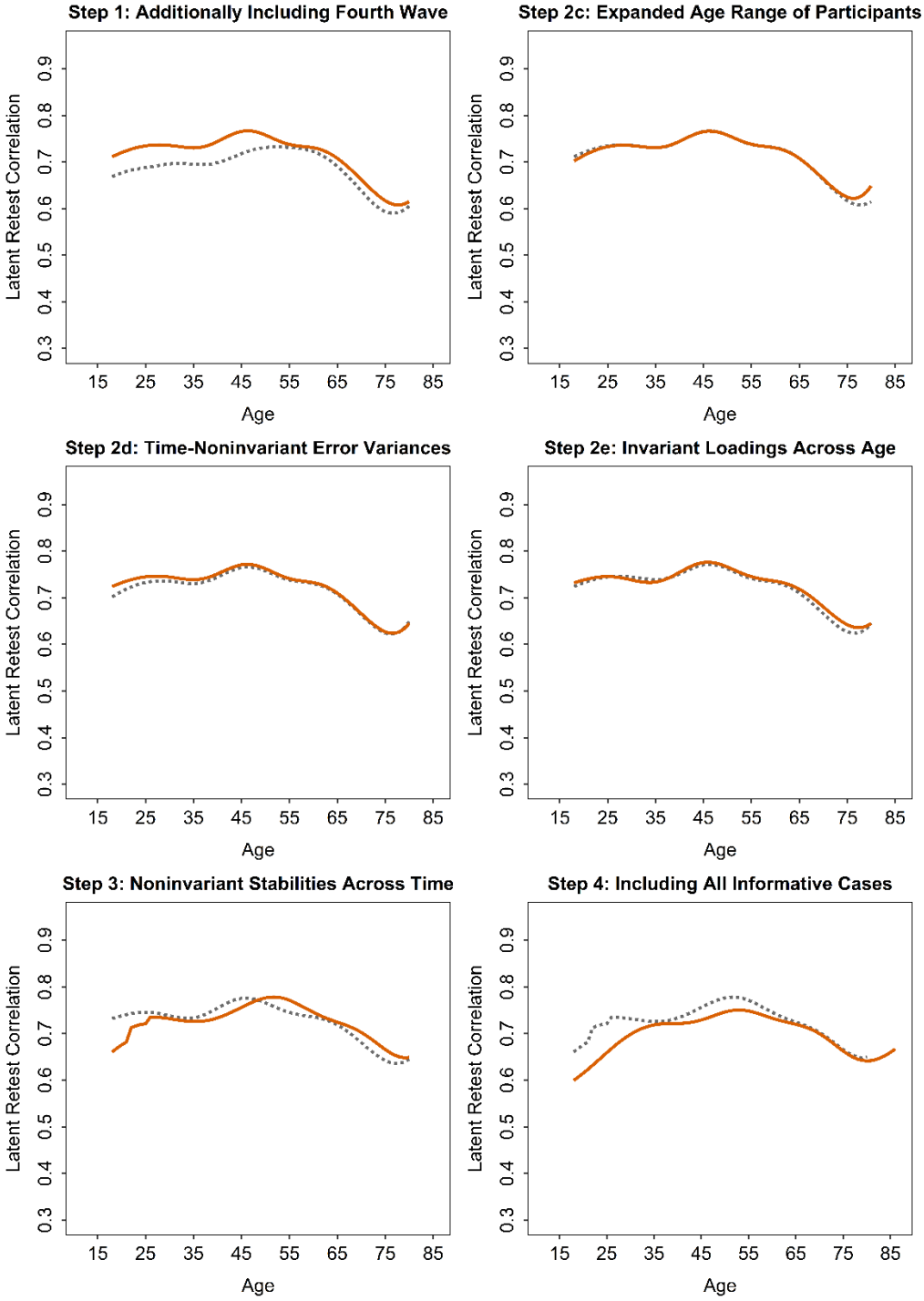
Impact of Methodological Changes (see Table S23) on the 4-Year Rank-Order Stabilities of Conscientiousness in the Socio-Economic Panel



Note. The dashed line indicates the trajectory of the respective previous step.

Figure S23

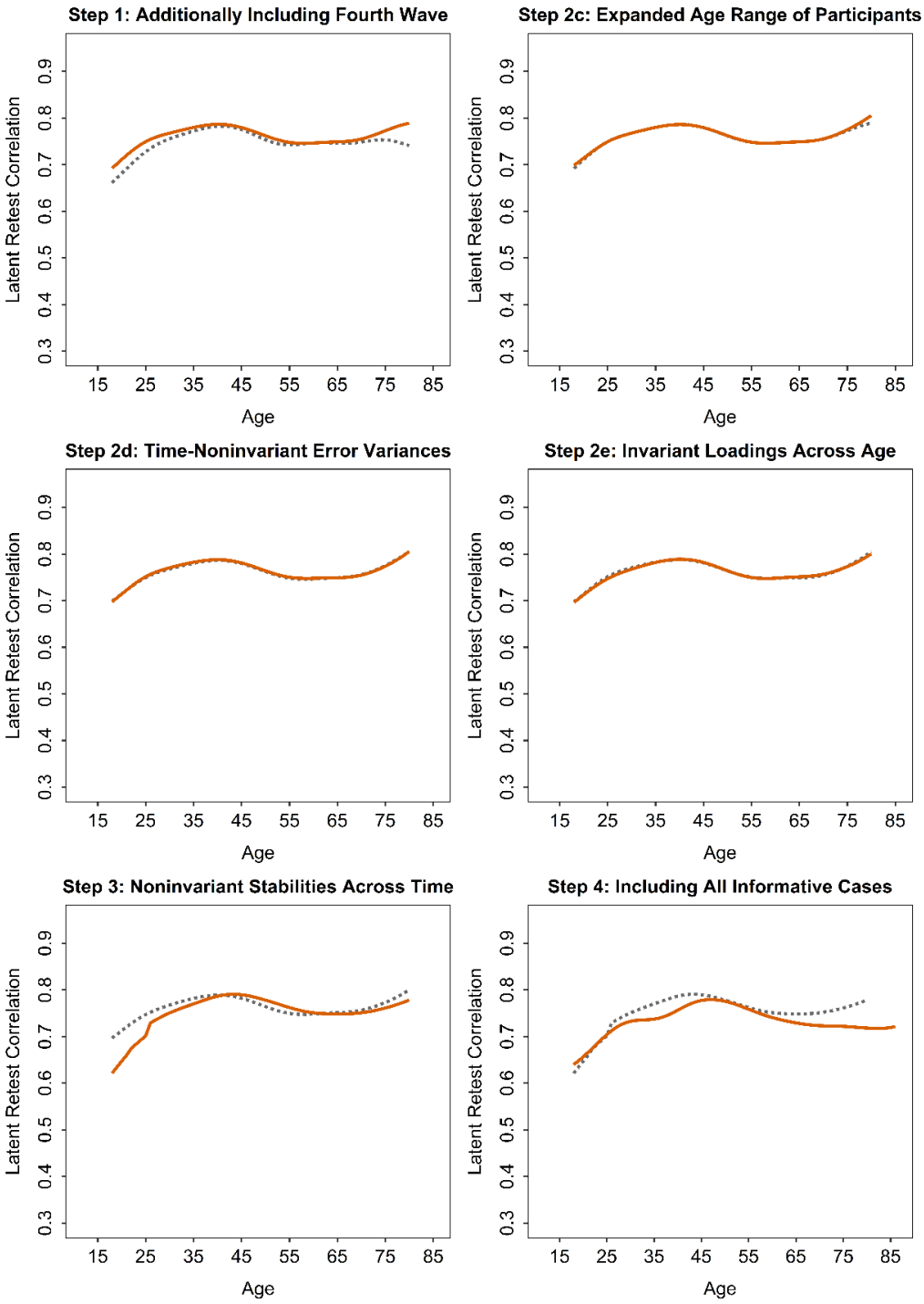
Impact of Methodological Changes (see Table S23) on the 4-Year Rank-Order Stabilities of Agreeableness in the Socio-Economic Panel



Note. The dashed line indicates the trajectory of the respective previous step.

Figure S24

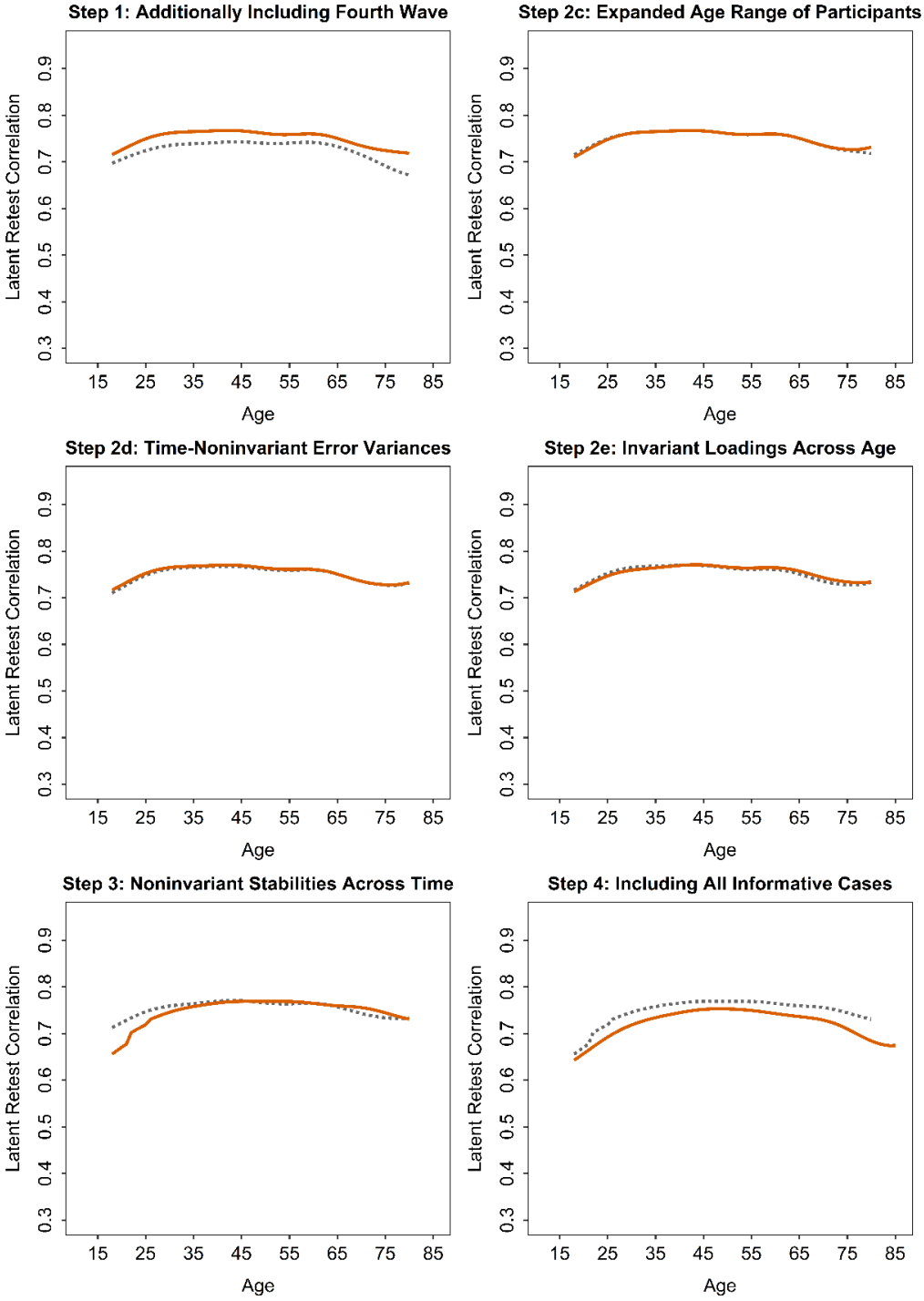
Impact of Methodological Changes (see Table S23) on the 4-Year Rank-Order Stabilities of Openness in the Socio-Economic Panel



Note. The dashed line indicates the trajectory of the respective previous step.

Figure S25

Impact of Methodological Changes (see Table S23) on the Mean 4-Year Rank-Order Stabilities in the Socio-Economic Panel



Note. The dashed line indicates the trajectory of the respective previous step.

Exploring the Role of Health on Personality Stability Development

Table S24

Features of the Analyses Addressing the Role of Health on Rank-Order Stability Development in the Household, Income and Labour Dynamics in Australia Survey (HILDA) and the Socio-Economic Panel (SOEP)

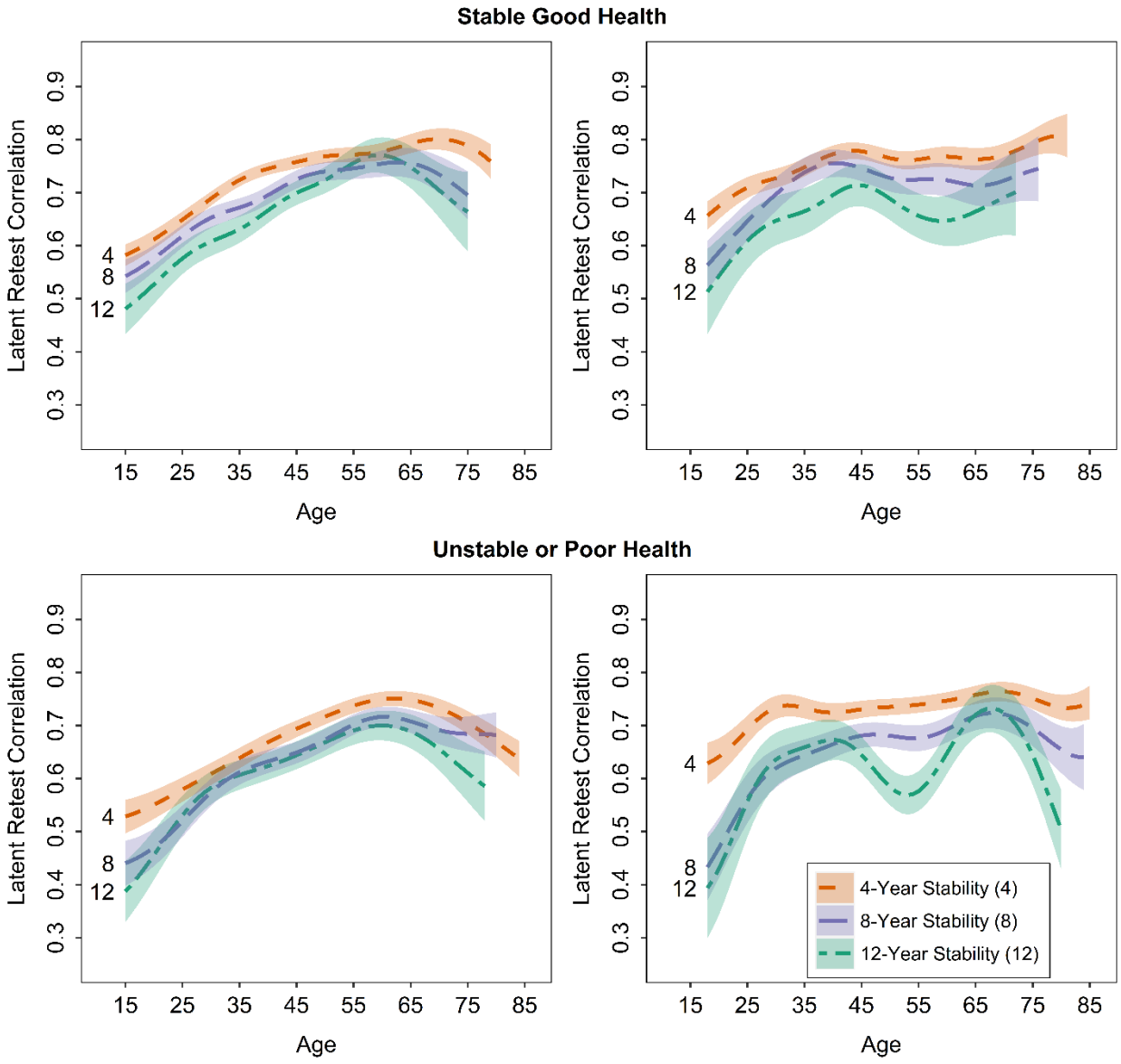
Factor	HILDA			SOEP		
	n	Focal points	Estimate for ages	*n*	Focal points	Estimate for ages
			Stable good health			
Neuroticism	9,180	7–79		11,232	10–82	
4-year stability			15–79			18–81
8-year stability			15–75			18–76
12-year stability			15–75			17–72
Extraversion	9,183	7–78		11,234	10–82	
4-year stability			15–78			18–81
8-year stability			15–75			18–76
12-year stability			15–75			17–72
Conscientiousness	9,178	7–78		11,233	10–82	
4-year stability			15–78			18–81
8-year stability			15–75			18–76
12-year stability			15–75			17–72
Agreeableness [a]	9,186	7–79		11,235	10–82	
4-year stability			15–79			18–81
8-year stability			15–75			18–76
12-year stability			15–75			17–72
Openness	9,176	7–78		11,234	10–82	
4-year stability			15–78			18–81
8-year stability			15–75			18–76
12-year stability			15–75			17–72
Mean stabilities						
4-year stability			15–78			18–81
8-year stability			15–75			18–76
12-year stability			15–75			17–72

Factor	HILDA			SOEP		
	n	Focal points	Estimate for ages	*n*	Focal points	Estimate for ages
			Unstable or poor health			
Neuroticism	6,253	7–84		10,536	10–85	
4-year stability			15–84			18–85
8-year stability			15–80			18–84
12-year stability			15–78			17–80
Extraversion	6,255	7–84		10,530	10–85	
4-year stability			15–84			18–85
8-year stability			15–81			18–84
12-year stability			15–78			17–80
Conscientiousness	6,244	7–84		10,527	10–85	
4-year stability			15–84			18–85
8-year stability			15–80			18–84
12-year stability			15–78			17–79
Agreeableness [a]	6,269	7–84		10,537	10–85	
4-year stability			15–84			18–85
8-year stability			15–82			18–84
12-year stability			15–78			17–80
Openness	6,235	7–84		10,525	10–85	
4-year stability			15–84			18–85
8-year stability			15–81			18–84
12-year stability			15–78			17–80
Mean stabilities						
4-year stability			15–84			18–85
8-year stability			15–80			18–84
12-year stability			15–78			17–79

[a] In SOEP, to avoid having nonpositive definite residual covariance matrices, the residual covariances of one Agreeableness item were fixed to 0.

Figure S26

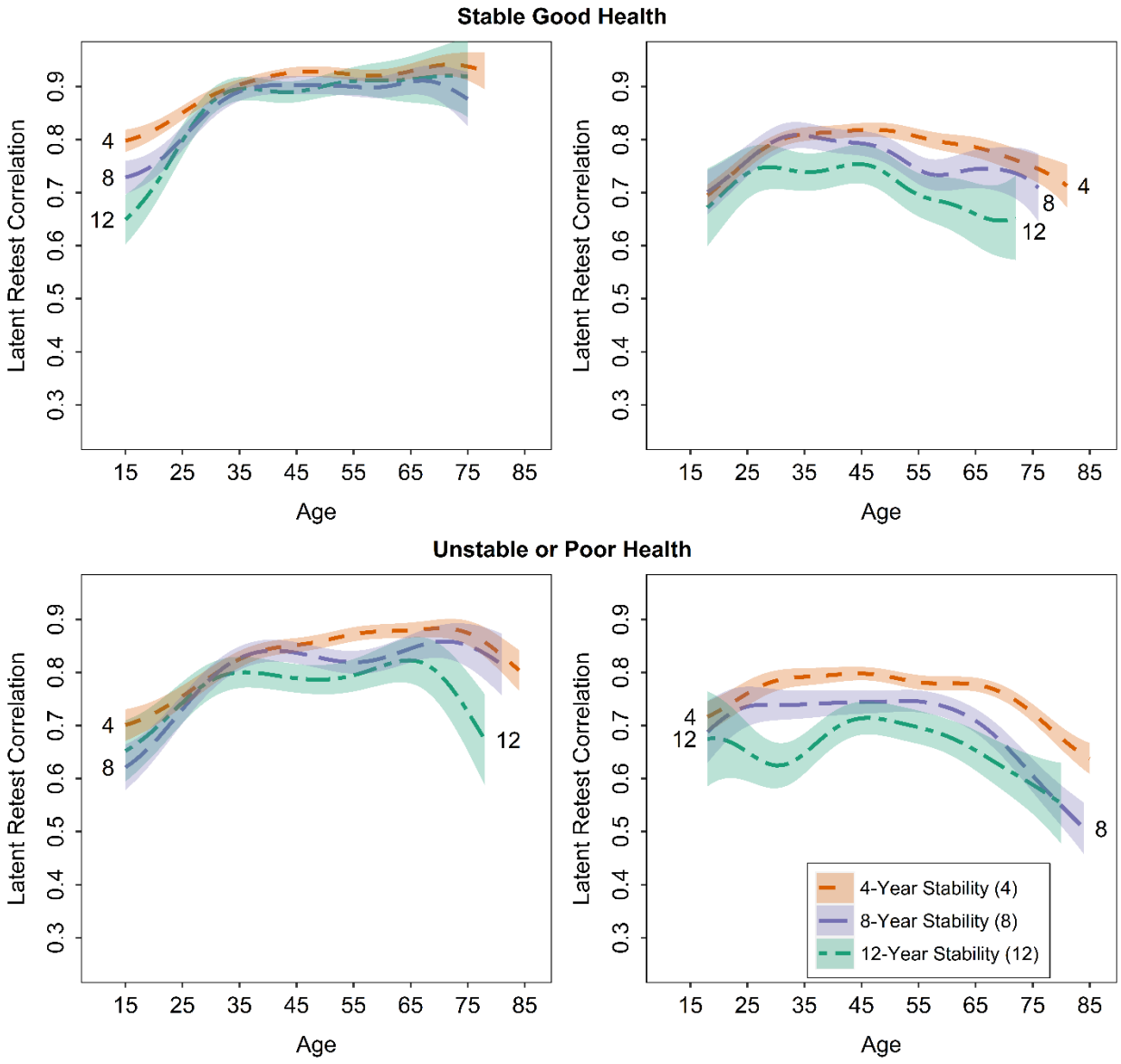
Health and the Neuroticism Rank-Order Stabilities for the 4-, 8-, and 12-Year Intervals Across Age in the Household, Income and Labour Dynamics in Australia Survey (Left Column) and the Socio-Economic Panel (Right Column)



Note. Shaded areas represent the bootstrapped standard error.

Figure S27

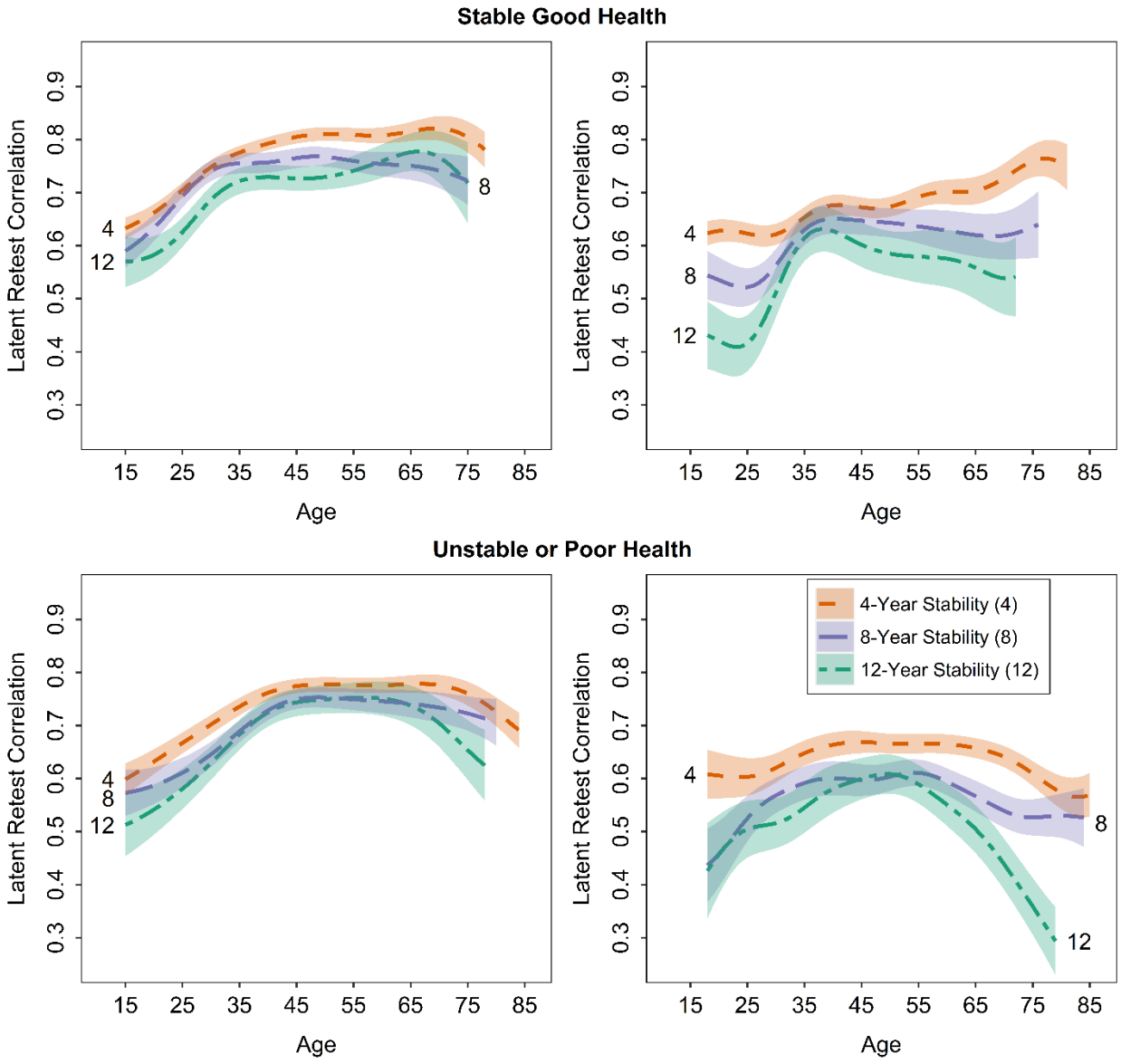
Health and the Extraversion Rank-Order Stabilities for the 4-, 8-, and 12-Year Intervals Across Age in the Household, Income and Labour Dynamics in Australia Survey (Left Column) and the Socio-Economic Panel (Right Column)



Note. Shaded areas represent the bootstrapped standard error.

Figure S28

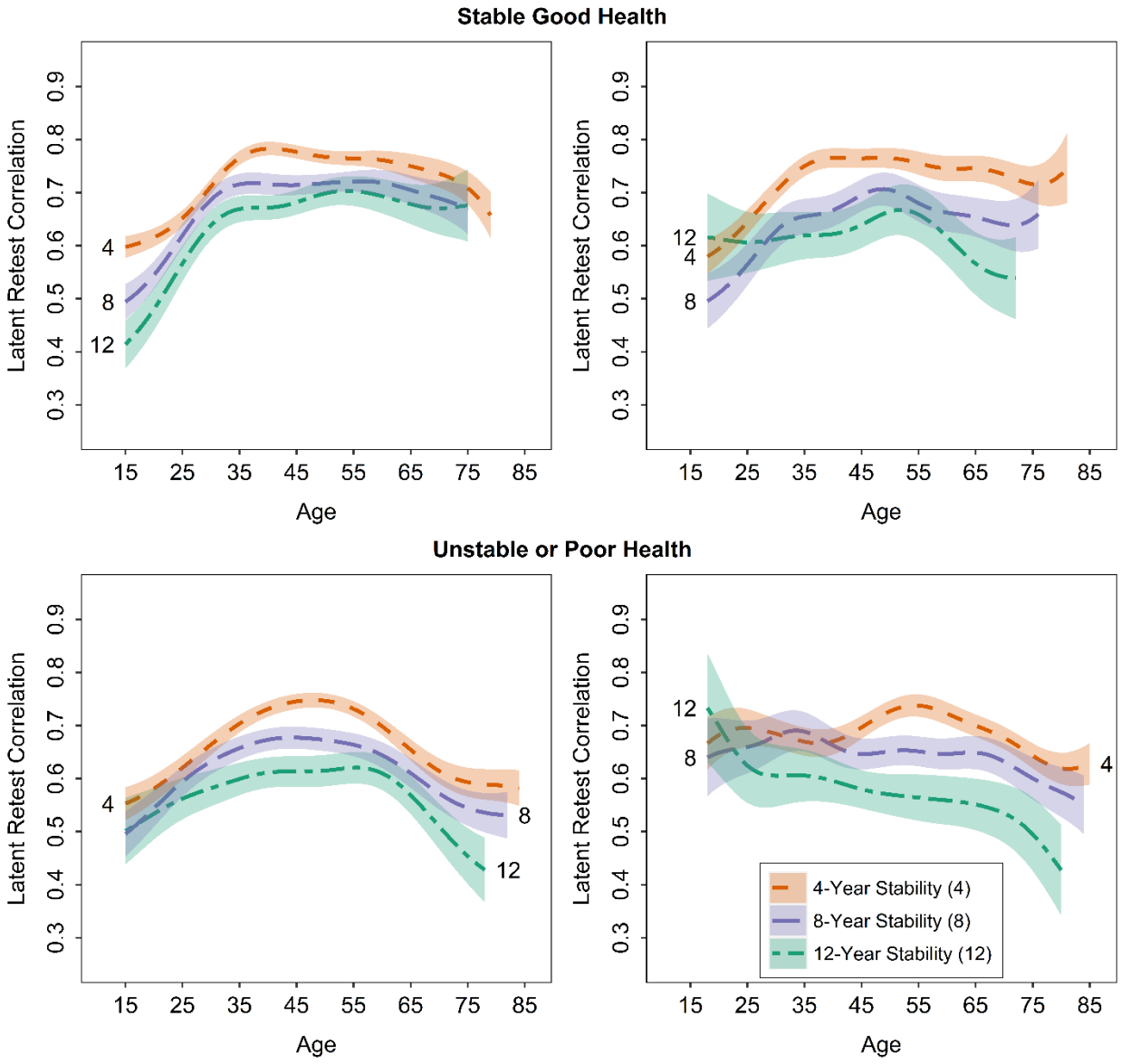
Health and the Conscientiousness Rank-Order Stabilities for the 4-, 8-, and 12-Year Intervals Across Age in the Household, Income and Labour Dynamics in Australia Survey (Left Column) and the Socio-Economic Panel (Right Column)



Note. Shaded areas represent the bootstrapped standard error.

Figure S29

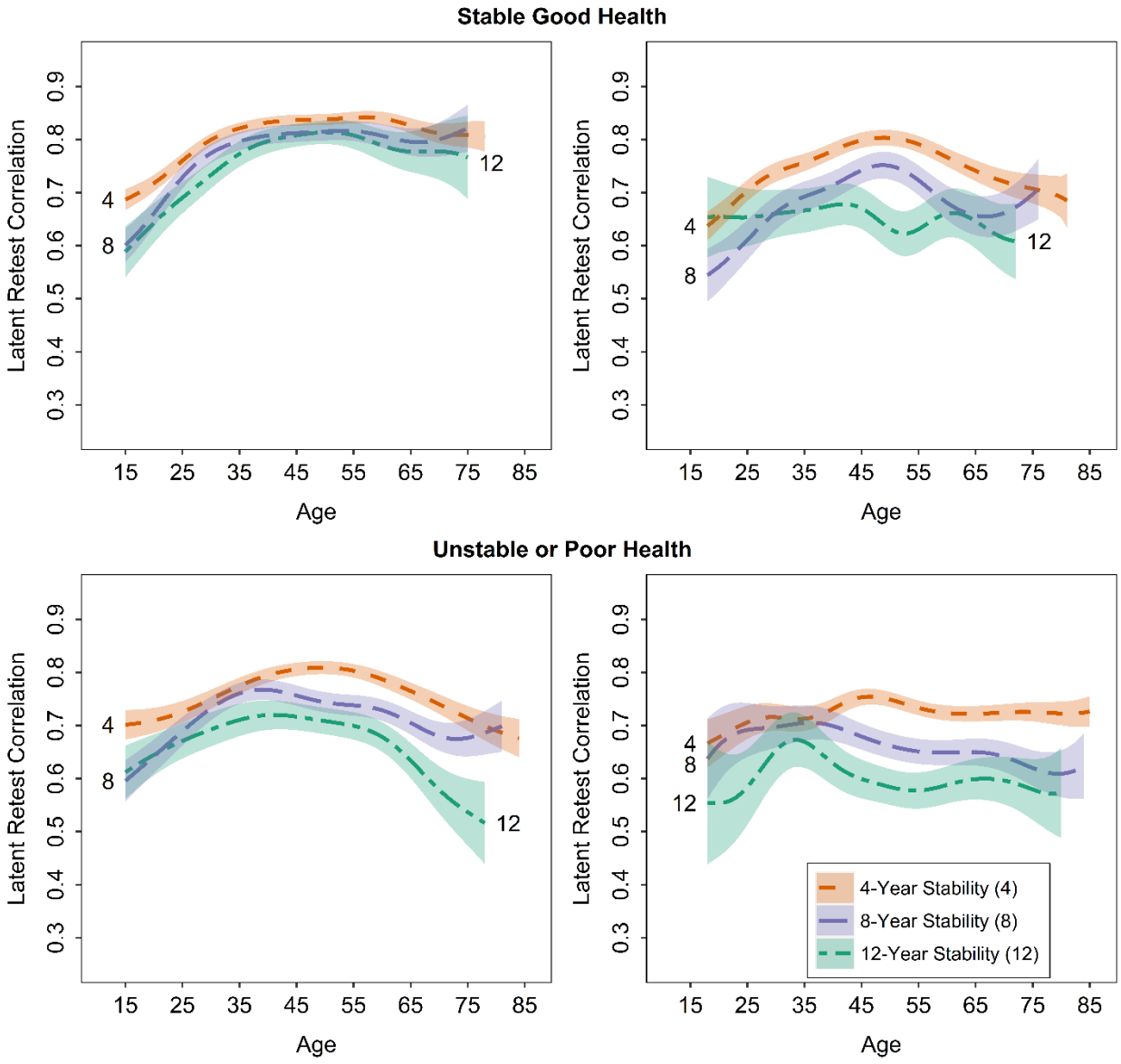
Health and the Agreeableness Rank-Order Stabilities for the 4-, 8-, and 12-Year Intervals Across Age in the Household, Income and Labour Dynamics in Australia Survey (Left Column) and the Socio-Economic Panel (Right Column)



Note. Shaded areas represent the bootstrapped standard error.

Figure S30

Health and the Openness Rank-Order Stabilities for the 4-, 8-, and 12-Year Intervals Across Age in the Household, Income and Labour Dynamics in Australia Survey (Left Column) and the Socio-Economic Panel (Right Column)



Note. Shaded areas represent the bootstrapped standard error.

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