

Paper II

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Stability and change in subjective health
complaints from adolescence to early adulthood

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Abstract

The aim of this study is to investigate the normative change and relative stability of subjective health complaints from age 13 to 23 years. Longitudinal data from the Norwegian Longitudinal Health Behaviour (NLHB) study ($n = 891$) were used, and subjective health complaints were measured on seven occasions using the NLHB symptom checklist. Only small normative changes in the mean level of complaints across age were found. However, growth curve analysis confirmed the emergence of a gender difference during early and mid adolescence. A moderate increase in cross-time correlation coefficients was found, and latent state–trait (LST) analysis indicated an increasing trait component in health complaints. Dividing the baseline sample into high-, medium-, and low-complaint groups revealed a substantial tracking of complaints across ages. The results from the present paper indicate a significant and increasing stability in subjective health complaints from early adolescence into early adulthood.

Keywords: Subjective health complaints; adolescence; gender difference; stability

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Introduction

An important issue in developmental life-span psychology is the question of continuity versus change (Brim & Kagan, 1980). The transition from adolescence to early adulthood is a period characterised by great bodily, psychological and psychosocial changes that may affect the experience of subjective health and well-being. In this study, the normative change and stability in subjective health complaints from early adolescence to early adulthood was addressed using data from a 10-year follow-up study.

Subjective health complaints refer to a wide range of symptoms experienced by individuals with or without a defined diagnosis (Haugland & Wold, 2001). Such symptoms are associated with significant disability and health-care utilisation (Shaw & Creed, 1991; Tellnes, Svendsen, Bruusgaard, & Bjerkedal, 1989). Knowledge about the normative change and stability in subjective health complaints is essential to understand how these complaints develop through adolescence into early adulthood. Moreover, such knowledge may also contribute to the identification of optimal times for preventive intervention.

There are various definitions of stability, and a useful distinction is often made between absolute and relative stability. As defined by Alsaker & Olweus (1992), absolute stability indicates the extent to which an individual's or a group's *absolute* level in a particular variable remains stable over time. Relative stability, on the other hand, indicates the extent to which an individual or group retains its *relative* position in a particular variable. Most studies addressing health complaints in adolescence across time (e.g. Aro, Paronen, & Aro, 1987; Rauste-von Wright & von Wright, 1981) do not make this important distinction between the different definitions of stability.

The state–trait distinction is well established in psychology, and is potentially useful in the study of stability and change in health complaints. States are attributes that are relatively changeable across situations, while traits are relatively stable. As part of growing up, developmental issues may cause age-related stressors in addition to the negative events and adversities common in other age groups. States of high psychosocial strain, such as demands at school (Torsheim & Wold, 2001), being a victim of bullying (Natvig, Albrektsen, & Qvarnstrøm, 2001) and a bad family environment (Garralda, 1996; Terre & Ghiselli, 1997) may cause a higher level of symptoms. Research indicates that the number of stressful life events levels out or even declines in later adolescence (Compas, Davis, & Forsythe, 1985; Graber & Brooks-Gunn,

1996), but it is not clear whether this affects the normative level and stability of somatic complaints. However, there is evidence of an increasing prevalence of complaints during early and the beginning of mid adolescence (Aro et al., 1987; Hakala, Rimpela, Salminen, Virtanen, & Rimpela, 2002; Perquin et al., 2000; Torsheim, Vålímáa, & Danielson, 2004), and that the level of complaints reaches a peak, and levels out, during mid adolescence (Aro et al., 1987; Rauste-von Wright & von Wright, 1981). Furthermore, existing research also indicates a shift from an almost equal prevalence of complaints across gender before adolescence, to a female predominance in symptom-reporting during adolescence (Hetland, Torsheim, & Aarø, 2002; Marschall, 1989; Rauste-von Wright & von Wright, 1981).

Individual characteristics, such as a person's resources for coping with stress, and the manner in which individuals actually cope with stress, may also be important factors influencing patterns of positive growth and development as opposed to the onset of psychological and somatic problems (Compas, 1987). It has been argued that an underlying personality trait, negative affectivity (NA), may influence the reporting of somatic and psychological complaints (Costa & McCrae, 1985; Pennebaker & Watson, 1991). Individuals with high NA are more likely to experience significant levels of distress and dissatisfaction over time and in any particular situation, even in the absence of overt stress. High

NA individuals tend to be more introspective, to dwell more on their failures and shortcomings, and to focus on the negative side of others and the world in general (Pennebaker & Watson, 1991). Because negative affectivity is highly stable, it is likely that it may be associated with a high level of relative stability in symptom reporting.

Previous longitudinal studies have found low- and medium-ranged stability coefficients in early adolescence (Verhulst & van Wattum, 1993; Wångby, 2000), and medium- to high-stability coefficients in mid and late adolescence (Aro et al., 1987; Rauste-von Wright & von Wright, 1981; Verhulst & van Wattum, 1993; Wångby, 2000). Among adults and the elderly, high stability coefficients are reported (Billings & Moos, 1982; Costa & McCrae, 1985). Increasing stability coefficients with increasing age suggest that there may be a consolidation of single symptoms or patterns of symptoms throughout adolescence and into adulthood. Results conflict on the extent of gender differences in the stability of somatic complaints during adolescence. A study by Verhulst & Wattum (1993) that was based on an epidemiological sample of Dutch adolescents aged 11–16 years revealed no clear pattern of higher stability coefficients for either gender. In addition, Aro et al. (1987) found no support for gender difference in the stability of symptoms in a sample of Finnish school students aged 14–16. In contrast to these studies, Rauste-von

Wright & von Wright (1981) found higher stability coefficients of somatic complaints among girls than boys aged 11–18.

Previous research addressing stability and change in subjective health complaints has been based mainly on small samples or studies over limited time periods. A methodological weakness in previous studies of relative stability in subjective health complaints is that they are based mainly on raw correlation coefficients between the different time points. When a number of stability coefficients on data with varying reliability are to be compared, raw correlation coefficients are usually less comparable than coefficients corrected for measurement error (Alsaker & Olweus, 1992). By using structural equation modelling (SEM), and considering subjective health complaints as a latent construct, it is possible to distinguish between various kinds of stability, and to estimate the error variance.

This study provides information about change in the level of subjective health complaint over a 10-year period based on data from a comparatively large sample. We examined stability in levels of subjective health complaints from adolescence to adulthood in four ways. First, the normative trends in the levels of subjective health complaint (absolute stability) were addressed by estimating mean levels and growth curve modelling, giving information about common patterns of change in complaints from adolescence into early

adulthood. Second, the relative stability in subjective health complaints was examined by calculating raw correlation coefficients across time points. Furthermore, a latent state–trait analysis was used to decompose the total variance in subjective health complaints across occasions into a trait component, state component, method component, and a random-error variance component. Finally, the stability of high-, medium-, and low-complaint groups (tracking) was examined. The various measures of stability were also examined for girls and boys separately to reveal potential differences in developmental patterns.

Methods

Data

Data used in the present study stem from the Norwegian Longitudinal Health behaviour study (NLHB). The NLHB-study is a 10-year prospective cohort study of self-reported health, health behaviour, and lifestyle among adolescents in Hordaland County, western Norway. Both participants and their parents gave informed consent before acceptance into the study.

A baseline study was conducted in 1990, with a representative sample of 924 students (510 boys and 414 girls) from 22 schools. The schools were selected from about 130 schools in the county. Participants' mean age at

baseline was 13.3 years ($SD = 0.3$). Students who did not wish to participate (4.0%), whose parents did not give their consent (19.0%), or who gave incomplete answers (0.3%) were not included in the study.

Follow-up studies were conducted in 1991, 1992, 1993, 1995, 1996, 1998, and 2000. This article draws on data from seven of the eight measurement points. Participants who responded with respect to the variables relevant to this paper on fewer than two of the occasions were excluded. After this procedure, the data set consisted of 891 participants, of which 469 were boys and 422 were girls.

Procedure

Data were collected via self-administered questionnaires. In data collections in 1990, 1991, and 1992, the participants were contacted at their school, and research staff distributed the questionnaires during school hours, without the presence of teachers in class. In 1993, 1996, 1998, and 2000, the questionnaires were mailed to the participants, because by then they had left upper-secondary school.

Materials

Subjective health complaints were measured by the NLHB symptom checklist.

Respondents reported the frequency of 10 symptoms (headache, stomachache, back pain, pain in the arms and legs, dizziness, nausea, poor appetite, colds or sore throat, fatigue and diarrhoea) in the previous three months on a three-point frequency scale with the categories 'very often', 'some of the time', and 'never'.

Preliminary reliability analysis (alpha) revealed that the 'colds or bad throat' item contributed negatively to the symptom scale at all measurement points except 1993. Furthermore, principal component analysis (oblique rotation) of all symptoms at the various measurement points yielded inconsistent factor structures and numbers of factors. After excluding three items ('colds or bad throat', 'pain in the arms and legs', and 'diarrhoea'), a consistent one-factor solution with acceptable factor loadings was found for all measurement points except 1996, where a structure of two factors was extracted. However, the eigenvalue of the second factor was only marginally higher than 1.0 (1.013), and the subsequent eigenvalues did not decrease sufficiently to support the existence of a second factor. Based on a preliminary reliability and explorative factor-analysis, the three items were excluded from the main analysis. For the remaining seven items, the following alphas were found: 0.75, 0.74, 0.72, 0.70, 0.72, 0.67 and 0.72, respectively, in 1990, 1991, 1992, 1993, 1996, 1998, and 2000.

Analyses

For examination of absolute stability, the seven symptoms were calculated into sum-scores for each measurement point. A mean complaint score and an effect size of the mean difference between boys and girls across occasions were calculated. Furthermore, a multilevel growth curve analysis was used to test for linear and curvilinear trends in the level of complaints by age and gender. In this analysis, the measurements at the various points in time are regarded as ‘nested’ within individuals, and therefore individuals constitute the top of the hierarchy (i.e. the second level) and time-points the bottom (i.e. the first level). The age variable was continuous and the ages were therefore centred on the mean age. Two models were tested. In the first model (Model 1), linear and curvilinear trends across ages were estimated for girls and boys together, and in the second model (Model 2), a gender-by-age interaction was added for both trends. The growth curve analyses were undertaken using the application *MLwiN 1.10*.

To investigate relative stability in complaints, two approaches were used: (1) the calculation of raw correlation coefficients between measurement points with one-, two- and three-year intervals; and (2) a latent state–trait (LST) analysis using the application *AMOS 4.1*. The LST model (Figure 1) was tested

for the whole sample as well as for boys and girls separately. In order to obtain a more equal time interval between the measurement points only five of the seven occasions were used in the analysis. The seven items were divided into three sum-scores, where the first sum-score was of the first and fourth symptoms ('headache' and 'dizziness'), the second sum-score the third and sixth symptoms ('back pain' and 'poor appetite'), and the third sum-score the second, fifth, and seventh symptoms ('stomachache', 'nausea', and 'fatigue'). The sum-scores were divided by the number of items. Analysis of the variance for each of the occasions was based on the formula provided by Schmitt & Steyer (1993), yielding the common-trait, state (occasion), specific-trait, and random-error variance. Missing cases were treated by full-information maximum likelihood (FIML). The FIML assumes multivariate normality and maximises the likelihood of the model in the light of the observed data (Wothke, 2000). The following indices of goodness of fit were applied: chi-square (χ^2), root-mean-square error of approximation (RMSEA), and the comparative fit index (CFI). As noted in various discussion lists (SEMNET), the use of FIML estimation in the application *AMOS* constrains means and intercepts to be zero, which may further inflate the values of some of the most common non-centrality indices. To manage this potential bias, the CFI was calculated with respect to a baseline model with unconstrained means and

intercepts by using *Fit calculator 2.00* (beta version 1).

- Insert Figure 1 about here -

The relative stability of complaint subgroups (tracking) was studied by dividing the baseline sample (1990) into thirds, giving low-, medium-, and high-complaint subgroups. The mean scores for each subgroup at the various measurement points and the effect size between the different subgroups across gender and age were calculated.

Results

Absolute stability

Table 1 shows that only small differences in the mean level of complaints across the various measurement points were found, and that the changes in mean level mainly occurred from age 13 to 16. Girls had higher complaint scores than boys at all measurement points, and the strength of the difference between the genders (i.e. the effect size) gradually increased until the age of 16, and thereafter decreased up to age 23.

- Insert Table 1 about here -

Table 2 presents the fixed effects, random effects, and $-2\log$ -likelihood for the two growth curve models. In Model 1, a significant negative linear and a positive curvilinear trend in complaints was found. In Model 2, when the gender-by-age interaction term was added, a small increase in the effects of the linear and curvilinear trends was found. Furthermore, the gender-by-age interaction was significant for the curvilinear trend, but not for the linear trend. There was a statistically significant decrease of the $-2\log$ -likelihood from Model 1 to Model 2 ($\Delta-2\log$ -likelihood = 22.4; $df = 2$; $p < 0.01$), which showed that the gender-by-age interaction term was valid.

- Insert Table 2 about here -

Figure 2 presents the predicted complaint score based on the curvilinear growth curve model with the gender-by-age interaction (Model 2). The figure shows a positive curvilinear trend in the complaint scores across ages among girls. The highest score among girls was obtained at age 15, and the lowest at age 23. For the boys, a reversed curvilinear trend was found where the lowest complaint score was at age 20, and the highest complaint score was at age 13.

- Insert Figure 2 about here -

Relative stability

Medium correlation coefficients were found between all the measurement points with different intervals for the total sample, as well for boys and girls separately (Table 3). The correlation coefficients between measurement points with one-, two-, and three-year intervals increased moderately with increasing age. One exception was a decrease of the correlation coefficients among girls between ages 14 and 15, and 15 and 16, another that no change of coefficients was found among boys between ages 19 and 21, and 21 to 23.

- Insert Table 3 about here -

Table 4 shows that all fit indices are within the limits normally recommended, which indicates that the LST-models tested fit the data well.

- Insert Table 4 about here -

Table 5 presents the analysis of variance across measurement points. In the analysis including boys and girls, an increase in the trait component from

ages 14 to 23 was found. In the same period, there was a decrease in the state component from ages 13 to 20. The state component increased again between ages 20 and 23. For boys, the trait component peaked at age 19 and stabilised through to age 23. The state component was lowest at age 19, but increased moderately until age 23. For girls, the trait component peaked at age 21, with a modest decrease thereafter until age 23. The state component was lowest at age 21, and increased thereafter until age 23.

- Insert Table 5 about here -

Relative stability in complaints in subgroups

Table 6 presents the mean symptom complaint score for all participants by subgroup, from ages 14 to 23. The low-, medium-, and high-complaint groups held their relative position from age 14 to 23, with the same pattern found among girls and boys separately.

- Insert Table 6 about here -

Estimation of effect sizes (Cohen's *d*) revealed that the relative differences in mean complaint scores for the three groups were high or medium

across all measurement points (Table 7).

- Insert Table 7 about here -

Discussion

The results from this study suggest that there is a high degree of *absolute* stability of subjective health complaints among girls and boys during adolescence and into early adulthood. A different developmental pattern was found among boys and girls, with girls reporting a higher level of complaints at all measurement points. Analyses of *relative* stability indicate a substantial level of stability of subjective health complaints, with evidence of slightly increasing stability with increasing age, for both boys and girls. Finally, a significant level of relative stability was found in low-, medium-, and high-complaint subgroups.

Normative development

Despite the great bodily, psychological and psychosocial changes that characterise adolescence, the high levels of absolute stability found in this study indicate that there are only small normative developmental changes in the levels of subjective health complaints from adolescence to early adulthood. However,

some changes in the level of complaints were found, and in line with the assumption that early adolescence is a time of disruption and transition (Larson, Moneta, Richards, & Wilson, 2002), our results indicate that such changes mainly occur during early and mid adolescence. The present study also supports previous research that suggests a peak in the mean level of complaints during early and mid adolescence (Aro et al., 1987; Eminson, Benjamin, Shortall, Woods, & Faragher, 1996; Rauste-von Wright & von Wright, 1981). There was a mild peaking of complaints among girls at age 15, whereas the highest level of complaints in the male group was found at the baseline measurement, at age 13.

Adult females report higher levels of subjective health complaints than do adult males (Eriksen, Svendsrod, Ursin, & Ursin, 1998; Ihlebaek, Eriksen, & Ursin, 2002), and it has been suggested that this difference develops during early adolescence (Eminson et al., 1996; Hetland et al., 2002; Rauste-von Wright & von Wright, 1981). Although we found only modest normative developmental changes, our results support the assumption that a gender difference develops during early adolescence. The gender difference was most distinct at the age of 16, and the growth curve analysis suggests that a different developmental pattern of subjective health complaints exists across gender and age. A positive curvilinear trend, with a peak in the level of complaints at age

15, was found among girls. By contrast, a negative curvilinear trend bottoming out at age 20 was found among boys.

It has been suggested that there are significant changes in the types of stress experienced in adolescence as compared to childhood, and that these changes are different for boys and girls (Compas, Orosan, & Grant, 1993). From this perspective, the different developmental patterns in complaints for boys and girls may be caused by differences in the levels of psychosocial stress affecting them during adolescence, and that the difference between the genders in psychosocial stress is at its greatest during mid to late adolescence. It has also been argued by Noack & Kracke (1997) that girls are psychologically and physically more likely to report health complaints, which may lead to higher levels of complaint among girls than boys in the face of challenges that increase in prevalence from early to mid adolescence. Finally, the reporting of complaints is likely to be influenced by societal and individual expectations (McGrath, 1994). The emerging gender difference in levels of complaint during mid and late adolescence may therefore reflect that it is socially and psychologically less acceptable for boys than for girls to report complaints during adolescence, particularly from mid to late adolescence.

Relative stability

In line with previous research (Aro et al., 1987; Verhulst & van Wattum, 1993), the results from this study reveal medium to medium high cross-time correlation coefficients, which indicate a substantial relative stability of subjective health complaints during adolescence. Furthermore, a considerable trait component in subjective health complaints is identified in the LTS analysis. It has been claimed that the reporting of complaints is influenced by the underlying personality factor of negative affectivity (Costa & McCrae, 1985; Pennebaker & Watson, 1991), and the stability of health complaints detected in the present study may give some support to the existence of such an underlying personality dimension. From a genetic point of view, a substantial continuity of complaints may also reflect a “switching on” of genetic factors (Rutter, 1991). Existing research has shown that genetics play a significant role in shaping emotional experience (Diener, Suh, Lucas, & Smith, 1999), and in line with this perspective higher relative stability may be found after the onset of these factors.

The present study has revealed some evidence supporting previous claims that early adolescence in particular is a time of greater instability of symptoms, and that the relative stability in complaints increases from mid to late adolescence and then into early adulthood (Aro et al., 1987; Rauste-von

Wright & von Wright, 1981; Verhulst & van Wattum, 1993). With only a few exceptions, somewhat larger cross-time correlation coefficients are found across ages for both boys and girls. These findings are also supported by the LST analysis. The results from the analysis showed that the trait component almost doubled from mid adolescence (age 14) to late adolescence and early adulthood. This increase is also more distinct among boys, for whom it is threefold. Interestingly, the increasing cross-time correlations, as well as the increasing trait component, may indicate that subjective health complaints consolidate during this period. The finding of a possible consolidation of complaints is consistent with previous research showing that the daily range of young people's emotions narrows between early and late adolescence (Larson et al., 2002), and that global self-evaluations tend to become more fixed during adolescence (Alsaker & Olweus, 1992).

A final question concerns the relative stability of subgroups with different levels of subjective health complaints from adolescence to early adulthood. Low-, medium-, and high-complaint subgroups mainly held their relative positions from ages 14 to 23, indicating a substantial stability within the three subgroups. The estimated effect size of the difference between the subgroups seemed to decrease from ages 14 to 19, and then to level out. However, this decline is predictable because of the phenomenon of 'regression

towards the mean', and the results support the assumption that the level of complaint in early adolescence to a large degree predicts the level of complaint in early adulthood. Furthermore, the results indicate that there is a subgroup with a higher level of subjective health complaints throughout adolescence and into early adulthood. Previous research on related ways of internalising symptoms, such as depression, has indicated the existence of a subgroup with higher levels of symptoms in adolescence (Charman, 1994; Holsen, Kraft, & Vitterso, 2000). The identification of such a group with persisting high levels of complaints is important, and may be of great concern for preventive efforts.

Methodological considerations

One possible limitation of the present study is that participants were asked to report the frequency of symptoms over a three-month period using symptom measures that cover long periods. Such large intervals may fail to distinguish between shorter-term changes that occur as typical peaks and troughs of health status and underlying changes over longer periods. The symptom checklist may have included too few answer categories (three), which may have limited the range of variance. A wider problem with the LST analysis used in this paper is that, in trying to fit a single factor (trait) to the correlations between the different occasions, the stability between the middle waves may have been

overestimated (Kenny & Zautra, 2001). The trait component reported for the first and last measurement points (ages 14 and 23) may therefore be slightly underestimated, while the state components at these measurement points may equally be overestimated. However, this would not affect the interpretation of our results substantially. Furthermore, a significant advantage of this study is the size of the cohort and that the participants were followed over comparatively long periods of time.

Conclusion

A gender difference by which girls report a higher level of subjective health complaints than boys seems to develop during early and mid adolescence. The relative stability detected in this study indicates that experiencing higher levels of subjective health complaints in early adolescence increases the probability of having higher levels of complaints later in adolescence and into early adulthood. Furthermore, the present study provides some evidence of a consolidation of subjective health complaints from early adolescence to early adulthood. This suggests that it may be important to initiate interventions early in this life period. Furthermore, the data reveal a subgroup with continually higher levels of subjective health complaints, which may be of great importance when it comes to the targeting of preventive efforts. Future research addressing

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Table 1. Mean complaint score and standard deviation across gender and age, and mean difference boys and girls effect size across age.

Age	Boys and girls		Boys		Girls		$\bar{x}$ girls - $\bar{x}$ boys	
	$\bar{x}$	Sd	$\bar{x}$	Sd	$\bar{x}$	Sd	Cohens'd	Total N
13 yrs	1.51	0.40	1.46	0.37	1.56	0.42	0.28*	613
14 yrs	1.43	0.38	1.35	0.34	1.52	0.40	0.45*	757
15 yrs	1.47	0.38	1.36	0.32	1.60	0.41	0.66*	823
16 yrs	1.43	0.36	1.31	0.30	1.55	0.38	0.71*	681
19 yrs	1.43	0.34	1.34	0.29	1.51	0.36	0.52*	618
21 yrs	1.43	0.32	1.35	0.28	1.49	0.33	0.47*	539
23 yrs	1.42	0.35	1.35	0.30	1.49	0.38	0.43*	591

*p< 0.01

Table 2. Curvilinear growth curve model: Random effects, fixed effects, and 2 loglikelihood

	Curvilinear-model		Curvilinear-model with gender interaction	
	b	SE	b	SE
Fixed effects				
Constant	134.79**	1.330	132.46**	1.420
Gender	18.41**	1.780	23.06**	2.034
Age	-0.76**	0.158	-0.88**	0.222
Age ²	0.09*	0.042	0.29**	0.059
Age*gender			0.26	0.314
Age ² *gender			-0.39**	0.084
Random effects				
Individual level				
Intercept	5.72**	0.335	5.74**	0.335
Slope	0.07**	0.009	0.07**	0.009
Cov slope/intercept	-0.14**	0.038	-0.14**	0.038
Occasion level				
Individual variability	5.81**	0.149	5.77**	0.148
-2loglikelihood	1964.835		1942.473	

All b and SE values are multiplied by 100

* $p < 0.05$; ** $p < 0.01$

Table 3. Raw correlation coefficients (Pearson) between somatic scores at different ages

Age	Total sample	Boys	Girls
One year interval			
13 - 14	0.56*	0.52*	0.59*
14 - 15	0.62*	0.53*	0.65*
15 - 16	0.64*	0.59*	0.59*
Two year interval			
13 - 15	0.50*	0.47*	0.51*
19 - 21	0.62*	0.63*	0.57*
21 - 23	0.63*	0.63*	0.61*
Three year interval			
13 - 16	0.41*	0.42*	0.37*
16 - 19	0.57*	0.61*	0.50*

* P<0.01

Table 4. Fit measures for LST model

	χ^2	df	RMSEA	CFI	n
Boys and girls	160.55	70	0.038	0.97	891
Boys	105.14	70	0.033	0.97	469
Girls	119.71	70	0.041	0.97	422

Table 5. Decomposition of variance in symptom scores across age and gender
(in % of total variance)

		Age				
		14 yrs.	16 yrs.	19 yrs.	21 yrs.	23 yrs.
Boys and girls						
	trait	16.8	25.4	30.8	29.8	29.2
	state	26.7	14.2	10.6	6.3	18.0
	item	10.8	14.0	17.6	18.2	11.0
	error	45.8	46.4	41.0	45.7	41.9
Boys						
	trait	9.4	23.7	29.9	29.5	28.6
	state	37.1	12.3	4.9	8.1	13.3
	item	4.5	14.3	19.9	23.3	18.3
	error	49.0	49.6	45.3	39.0	39.8
Girls						
	trait	17.3	20.3	24.7	28.7	26.1
	state	23.1	16.3	15.8	5.8	22.5
	item	16.1	15.4	18.5	14.9	8.7
	error	43.5	47.9	41.0	50.5	42.7

Table 6. Mean and standard deviation in low, medium, and high complaint group across gender and age

Age	Low			Medium			High		
	$\bar{x}$	sd	n	$\bar{x}$	sd	n	$\bar{x}$	sd	n
Boys and girls									
14 yrs	1.21	0.28	146	1.38	0.30	243	1.69	0.42	188
15 yrs	1.24	0.27	147	1.44	0.34	247	1.68	0.41	193
16 yrs	1.25	0.30	128	1.40	0.31	204	1.62	0.40	153
19 yrs	1.30	0.29	110	1.40	0.32	179	1.58	0.36	132
21 yrs	1.28	0.25	94	1.40	0.29	145	1.57	0.32	119
23 yrs	1.25	0.25	98	1.42	0.35	176	1.57	0.38	119
Boys									
14 yrs	1.17	0.27	81	1.33	0.30	137	1.58	0.39	81
15 yrs	1.16	0.19	82	1.37	0.32	140	1.54	0.32	84
16 yrs	1.17	0.20	68	1.31	0.26	111	1.48	0.37	61
19 yrs	1.21	0.24	54	1.32	0.26	91	1.49	0.33	45
21 yrs	1.21	0.19	44	1.34	0.26	67	1.49	0.32	39
23 yrs	1.21	0.21	49	1.34	0.29	91	1.49	0.36	43
Girls									
14 yrs	1.26	0.28	65	1.44	0.29	106	1.77	0.43	107
15 yrs	1.35	0.31	65	1.53	0.35	107	1.79	0.44	109
16 yrs	1.34	0.37	60	1.51	0.32	93	1.71	0.39	92
19 yrs	1.38	0.31	56	1.48	0.35	88	1.63	0.37	87
21 yrs	1.35	0.28	50	1.46	0.32	78	1.61	0.31	80
23 yrs	1.29	0.29	49	1.51	0.39	85	1.61	0.39	76

Table 7. Estimated effect size (Cohens' d) between high, medium, and low symptom groups at age 13 across gender and age.

	Boys and Girls		Boys		Girls	
	<u>High-medium</u>	<u>Medium-low</u>	<u>High-medium</u>	<u>Medium-low</u>	<u>High-medium</u>	<u>Medium-low</u>
Age						
14 yrs.	0.92*	0.49*	0.80*	0.51*	0.95*	0.49*
15 yrs.	0.70*	0.56*	0.60*	0.72*	0.70*	0.47*
16 yrs.	0.65*	0.46*	0.61*	0.51*	0.56*	0.48*
19 yrs.	0.56*	0.29*	0.62*	0.37*	0.42*	0.27*
21 yrs	0.58*	0.41*	0.59*	0.50*	0.51*	0.36*
23 yrs.	0.43*	0.51*	0.52*	0.46*	0.28*	0.59*

* P< 0.01

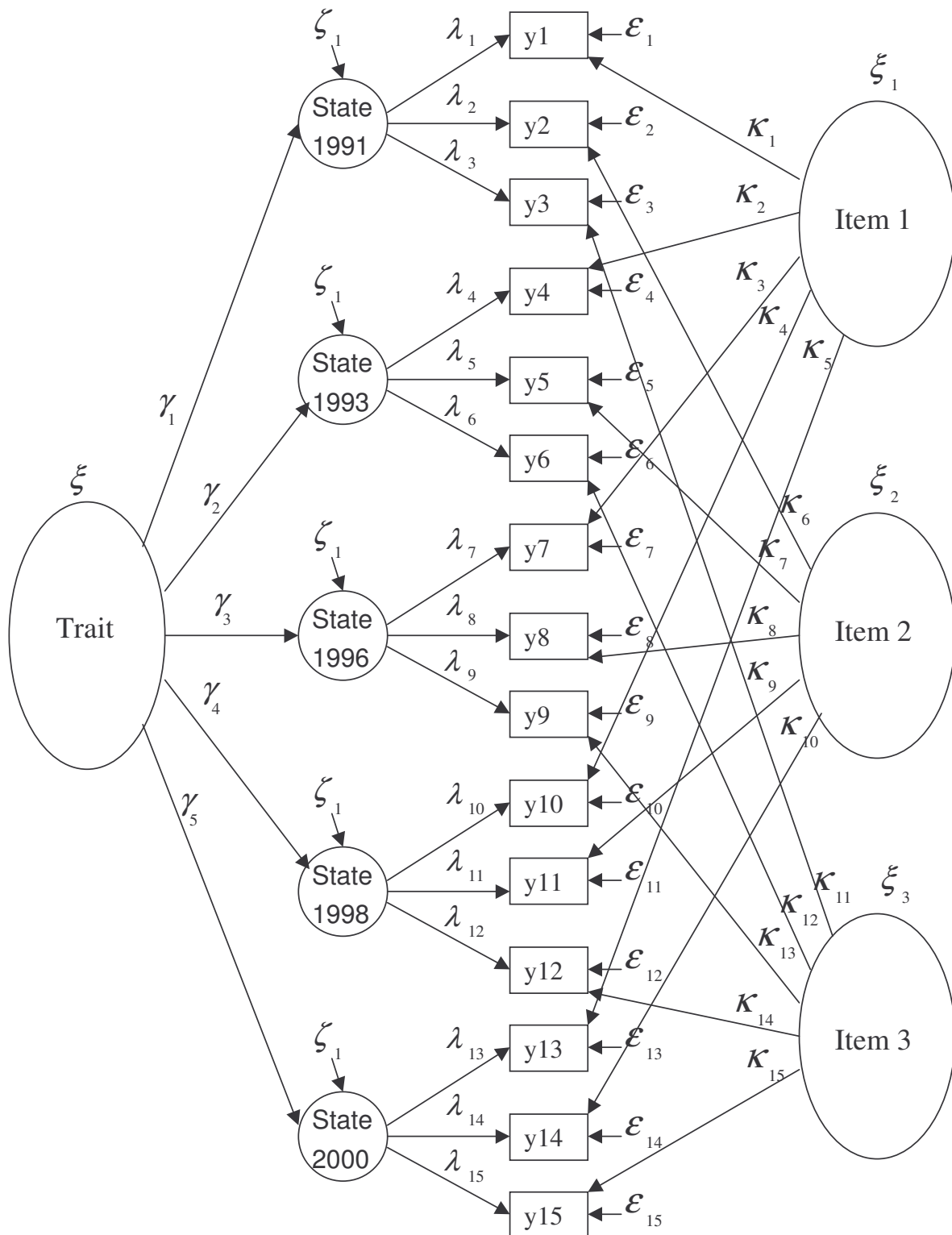


Figure 1. Latent State-Trait (LST)-model

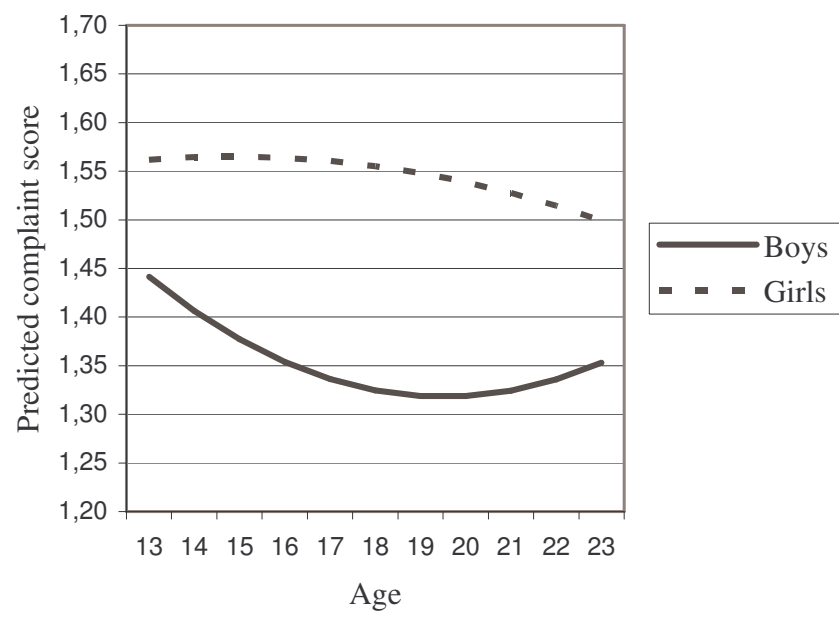


Figure 2. Predicted complaint score by age and gender based on a curvilinear growth curve model (model 2).

normative development and the stability of subjective health complaints from childhood to adolescence is called for.