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Non-Reciprocal Effect of Self-Assessed Health on Changes in Activities of Daily Living in a Swiss Longitudinal Sample

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Part 1: Sample Description

Age parallel cohort design on very old adults

Cohort 1: Time 1 mean age = 81.9, age range = 79.2 – 84.4 yrs.

Cohort 2: Time 1 mean age = 81.9, age range = 79.5 – 84.5 yrs.

cohort 1			cohort 2		
N	dead	drop	year interval		
340	na	na	1994	18	
267	33	39	1995	12	
237	22	9	1996	12	
209	21	7	1997	18	
172	32	5	1999	18	N dead drop
128	35	9	2000	18	376 na na
100	18	10	2001	12	289 18 69
80	-	-	2002	12	247 16 26
			2004	18	212 - -

Achieved
Financed and planned

SWILSO-O, the first longitudinal Swiss research on the oldest old, examines the life and health trajectories, the social and support networks, the events, and the regulatory processes adopted by the oldest old and by their entourage.

SWILSO-O began at its first stage in 1994, with an initial sample of 340 people aged between 80 and 84 years, community dwelling (172 ♂, 168 ♀; 173 Canton Geneva, 167 Canton Valais). In 1999 a second cohort of 376 80- to 85-year old people (185 ♂, 191 ♀; 185 urban Canton of Geneva, 191 semi-urban Canton of Valais) represented the start of the second stage of the study.

Between 1994 and 2001, 2,657 interviews have been completed (1,533 throughout 8 waves on the first cohort and 1,124 throughout 4 waves on the second cohort).

Data analyzed here are from the first 5 waves of the first cohort, totalling 1,225 interviews; of these, 995 were living at home and able to respond (i.e., they were not replaced by proxies).

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Part 2: Examining Change in Activities of Daily Living and Self-Assessed Health Univariately and Bivariately

Abstract: The strong external validity of subjectively-reported health has been recognized for over two decades. Likewise, the importance of assessing elderly persons' capacities to attend to some of their basic daily needs is also well documented. The relationship between the two central life spheres, however, is not apparent. While many scholars obtained evidence for a strong relationship between **self-assessed health (SAH)** and **activities of daily living (ADL)**, others concluded that the link between the two is low at best. Most data sets analyzed for this body of literature however are cross-sectional, reducing thus all possible associations between SAH and ADL to their instantaneous expression. This research further attempts to elucidate the **bivariate relations** examined and expands on their temporal expression. Advanced latent growth models are applied to examine static and **dynamic error-free relationships** among SAH and ADL in the **Swiss Interdisciplinary Longitudinal Study on the Oldest Old**. The sample, at study inception, was composed of **340 community-dwelling octogenarians** who have been **examined longitudinally on five occasions**. During the five years of assessment, the sample's average number of ADL increased by 1.5, while their SAH (assessed on a five-point scale) diminished by less than half a point. Initial SAH and ADL levels correlated -0.12, while the respective slopes correlated 0.26. More importantly, **SAH exerted a uni-directional, error-free longitudinal effect on changes in ADL over four times bigger than the auto-proportional effect that ADL exerted over its own longitudinal changes**. ADL did not affect longitudinally changes in SAH.

Level information

Change information

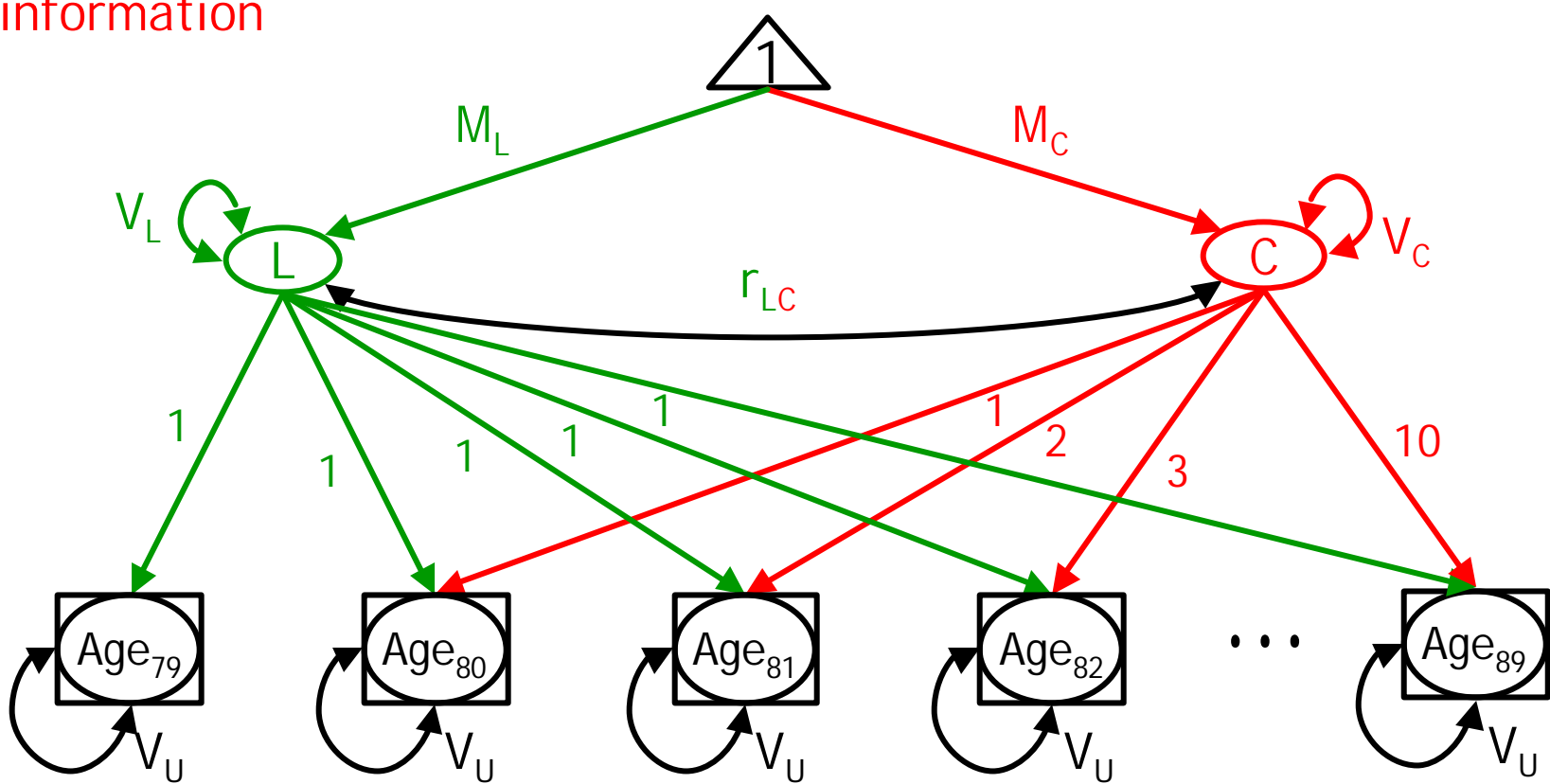


Figure 1: A SEM representation of a Latent Growth Model

Results 1: Univariate LGMs

	ADL	SAH
Means		
mean level	46.76 (0.75)	51.11 (0.72)
mean change	1.13 (0.19)	-0.35 (0.12)

Variances		
var. level	38.68 (8.31)	49.38 (5.36)
var. change	3.22 (0.49)	n.s.
var. uniq.	45.29 (2.60)	40.23 (2.16)

Covariance		
Level ADL - Change ADL	n.s.	

Fit		
-2LL	7,193	6,864

Note: point estimate (standard error).

Results 2: Bivariate LGM

	ADL	SAH
Means		
mean level	46.73 (0.79)	51.13 (0.71)
mean change	1.13 (0.19)	-0.37 (0.12)

Variances		
var. level	56.24 (13.38)	50.41 (5.44)
var. change	3.69 (0.73)	n.s.
var. uniq.	44.66 (2.70)	40.10 (2.15)

Covariances		
Level ADL - Level SAH	n.s.	
Level ADL - Change ADL	n.s.	
Level SAH - Change ADL	-7.42 (1.50)	
Uniq. ADL - Uniq. SAH	-12.78 (1.75)	

Fit		
-2LL	13,891	

Note: point estimate (standard error).

During the 60 months of longitudinal assessment, **overall** sample average **negative change** were observed on health variables. Each year participants increased by 1.13 T-unit points on the ADL and decreased by 0.35 T-unit points in SAH. In terms of the original scales (ADL ranges from 0 to 16 incapacities; SAH was assessed on a five-point Likert type scale), the sample reported **1.5 more incapacities** and less than a **0.5-point decrease in health** over the five-year interval (the self-reported depressive symptoms remained on the average constant over the same period). **Large interindividual differences in both ADL and SAH** were observed at study inception. **Differential change in ADL** was minor but reliable.

The Bivariate Latent Growth Model allowed assessing the reliable static relation between level in SAH and change in ADL. **Levels in SAH and ADL were not found to be associated**, but the unique residual components of both time series shared variance. The BLGM contributed a chi-square gain of 166 points for 3 degrees of freedom over the Univariate LGMs. The difference in fit is highly significant (RMSEA = 0.43, 95% confidence interval = [0.36-0.50]).

Part 3: Dynamic Relations between ADL and SAH

Concept: Little is known about the relations between functional (ADL) and subjective (SAH) health in older people. Longitudinal assessments are scarce and methodological approaches often limit their scope to static relations. To investigate processes of health regulations in older adults we applied a **linear dynamic structural equation model**

Method: We applied the Bivariate Dual Change Score Model (BDCSM; McArdle & Hamagami, 2000. 2001) to the ADL and the SAH scores. The BDCSM is an extension of a bivariate latent growth model. Two additional parameters are estimated: **b**, the direct, reliable effect the score of one variable at time t exerts on the change of that variable between times t and t-1 (autoprotection); **g**, the direct, reliable effect the score of one variable at time t exerts on the change of the other variable between times t and t-1 (cross-lag).

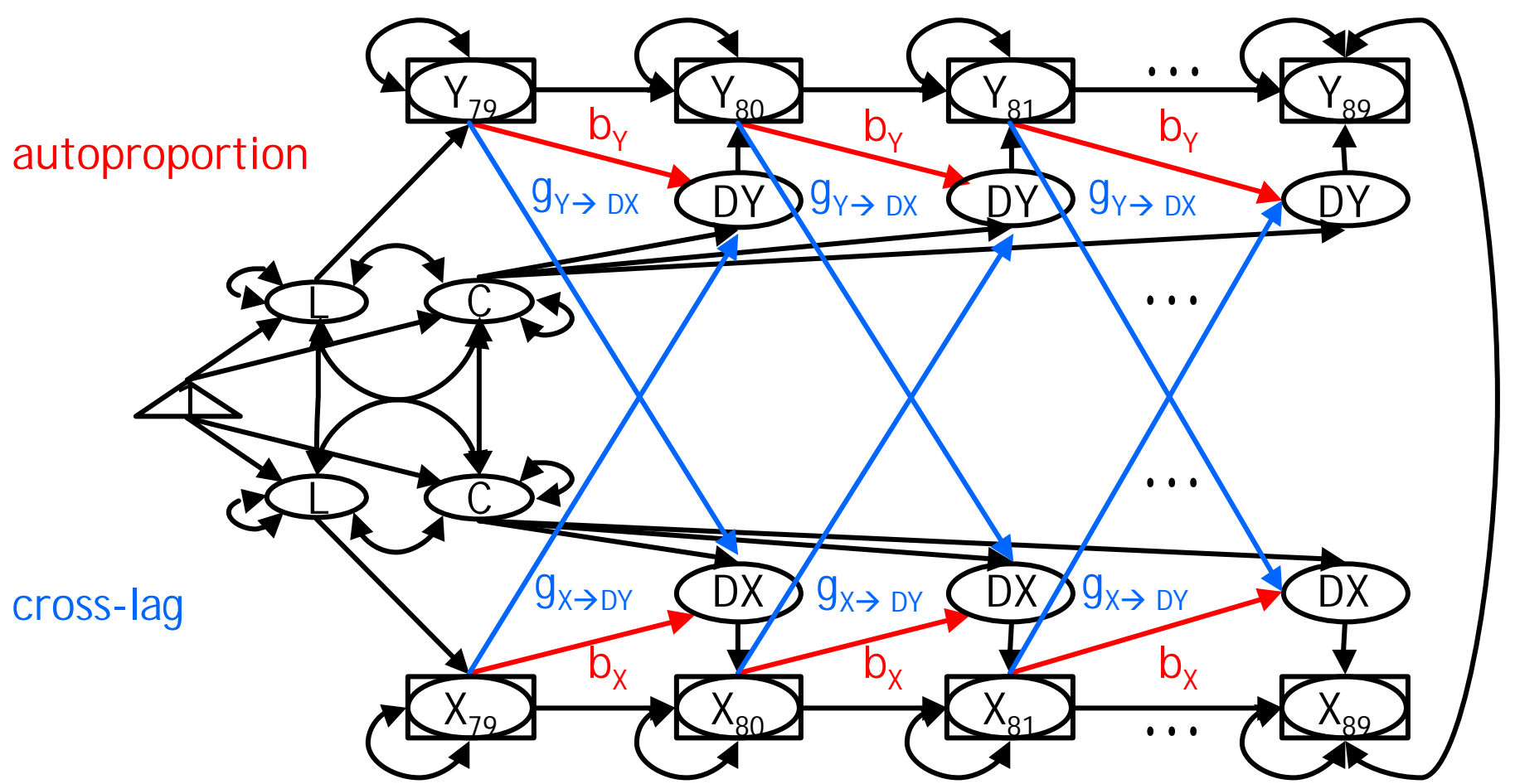


Figure 2: A SEM representation of a Bivariate Dual Change Score Model

Results 3: Bivariate Dual Change Score Model

ADL displayed a weak but reliable autoprotection effect, while SAH did not. However, **SAH exerted a cross-lag effect on the change in ADL, which was more than four times bigger than the autoprotection effect of ADL.** ADL did not affect the change in SAH. The error-free, longitudinal effect held despite of the age-heterogeneity of the sample.

The **predictive power and strong external validity of self-assessed health** were confirmed in these data on very old people.