Methodological and Analytical Aspects of Longitudinal Research

Koletić, Goran

Methodological and Analytical Aspects of Longitudinal Research

COORDINATE project

November 17, 2023

Goran Koletić, PhD
Department of Sociology
Faculty of Humanities and Social Sciences
University of Zagreb

LECTURE CONTENT

1. Aspects of longitudinal design (a brief overview)
   - Longitudinal hypotheses
   - Sample size
   - Number of waves
   - Measures
2. Challenges and recommendations
   - Logistic
   - Methodological
     - Attrition
3. Choosing an analysis framework (a brief overview + example)

WHAT IS LONGITUDINAL DESIGN?

Data collected using multiple measurement occasions across time nested within same entities (e.g., individuals – within-individual changes over time)

https://www.scribbr.com/methodology/longitudinal-study/

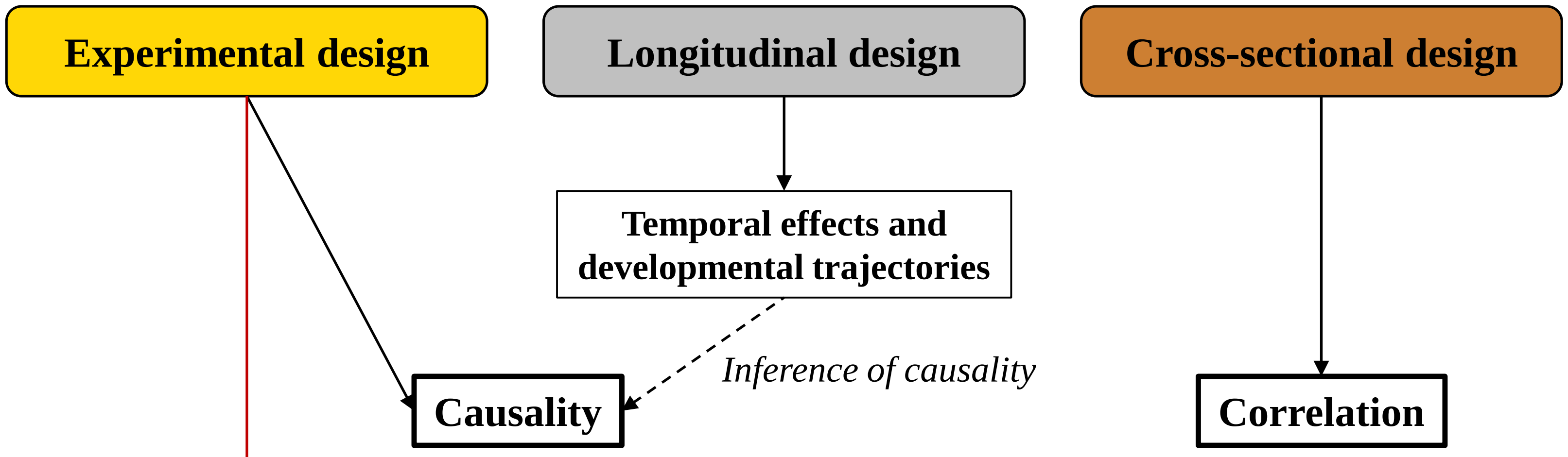
At least **three measurement occasions** (waves)

- With only two waves of data: a) difficult to disentangle true change from measurement error; b) impossible to model nonlinear forms of change.

Different from (econometric) time-series design.

In some cases...THE BEST POSSIBLE DESIGN?

How to assess pornography use in adolescent population?



Issues:

1. Research ethics precludes the use of experiments in sensitive research with **minors.**
2. Having control group with subjects that were never in contact with pornography?

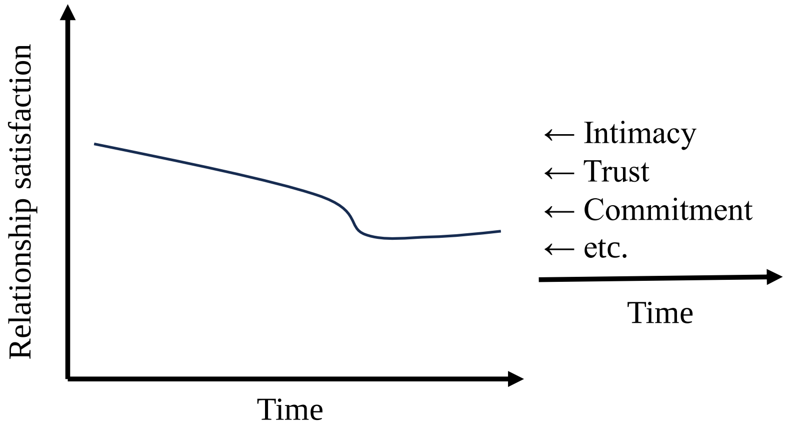
Qualitative

NEED FOR LONGITUDINAL DESIGN

1. Assess temporal effects and developmental trajectories.
2. Test existing (cross-sectional) theory from a longitudinal perspective.
3. While cross-sectional studies render causal inference unwarranted, well-conducted longitudinal study will provide an inference of causality.
    - For example, should we pursuit experimental design for a target topic or not?
4. Do conclusions differ between cross-sectional and longitudinal designs?
    - Compare longitudinal effect sizes to the cross-sectional effect sizes.
    - If a longitudinal study makes the same predictions and leads to the same conclusions as a cross-sectional study, is there a unique theoretical contribution?

CONSTRUCTING LONGITUDINAL HYPOTHESES

- Not uncommon that theories (or research-related conclusions) overlook **when** an effect is likely to occur or for what **duration.**
  - Longitudinal versions of cross-sectional hypotheses
    - „A is associated with B” → „A is associated with B *over time*”
- **Focus on unique change in a construct (vs. its static representation):**
  1. When does the change occur?
  2. For how long it lasts and how it changes?
  3. Why it changes?
  4. What is <u>associated</u> with the change?
  5. What is the nature of the association?
     - Decreasing/increasing trend
       - Less or more substantial change



SAMPLE SIZE

As large as possible! (attrition)

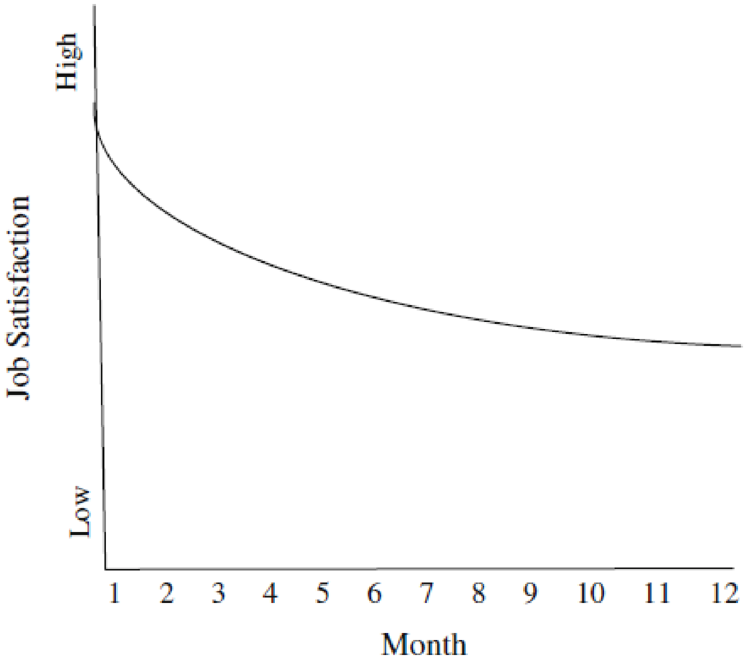
Keep in mind that:

1. Total sample size (observations) = subjects x measurement occasions
2. Within-subject designs have smaller error terms (compared to cross-sectional designs)
3. Power analysis is complex (subjects, measurement occasions, linear or nonlinear change, variability in change over time)
   - Adding more subjects should reflect on between-person effects
   - Adding more measurement occasions should reflect on within-person effects

NUMBER OF MEASUREMENT OCCASIONS

Exactly equal spacing (less important) vs. number of time points (more important)

- Frequent enough to detect hypothesized kind of change and that the occasions cover a reasonable duration of time



(Ployhart & Ward, 2011)

Possible assessments:

T1, T12: detecting linear decline
T1, T6, T12: detecting nonlinearity
T1, T2, T3: overestimating negative slope
T10, T11, T12: underestimating negative slope

Guidelines for number measurement occasions (and time lags)

1. Review related literature.
2. When there is no „natural'' measurement dynamic, conduct interviews or behavioral observations with relevant subjects to determine a measurement schedule.

CHALLENGES

LOGISTIC

- Time consuming (number of waves, time lags)
- Recruitment
  - Often requires larger baseline samples
- „Gatekeepers” (classroom-based)
  - School principals, etc.
- Motivating participants (online)
  - Incentives

METHODOLOGICAL

- Attrition
  - Reasons for lost to follow-up participants
  - Potential bias
  - Online vs. classroom-based (on-site) vs. commercial panel
- Familiarity with research topic and measures
- (Re)contacting participants and linking surveys
- Assuring anonymity (online)
- Assuring privacy (classroom-based)

FINANCIAL

- Requires a research team
- Expensive

RECENT EXPERIANCE

Prospective Biopsychosocial Study of the Effects of Sexually Explicit Material on Young People's Sexual Socialization and Health (2015-2018)

Project leader: Aleksandar Štulhofer, PhD
Team: sociologists, psychologists and a medical biochemist

14 international collaborators  etc.

40 published papers

Topics: question-behavior effect, parental monitoring, body-surveillance, internalization of appearance ideals, sexism, the role of religiosity, compulsive pornography use, communication about sexuality, well-being, sexual risk taking, sexual victimization, sexual permissiveness, perceived pornography realism, academic achievement, content progression thesis, sexual satisfaction, sexting, sexual aggressiveness, sexual agency, selective dropout, the role of testosterone, etc.

http://probiops.ffzg.hr

Funded by Croatian Science Foundation

PROBIOPS: Participants and procedures

ZAGREB

- Spring 2015.
- 59/90 high-schools
- 6 waves
- 6 month between waves
- Leaflet recruitment
- Online questionnaires
- N ($T1_{baseline}$) = 2,235
- Lottery based incentives

RIJEKA (population wise, 3rd Croatian city)

- Winter 2015.
- 14/23 high-schools
- 6 waves
- 5-6 month between waves
- Classroom based
- Paper-pen questionnaires
- N ($T1_{baseline}$) = 1,287
- No incentives

ZAGREB		
Wave	**Year**	**N**
1	2015	2235
2		636
3	2016	711
4		683
5	2017	686
6		511

Mean age (T1) = 16.2
41% M / 59% F

All 6 waves = 307

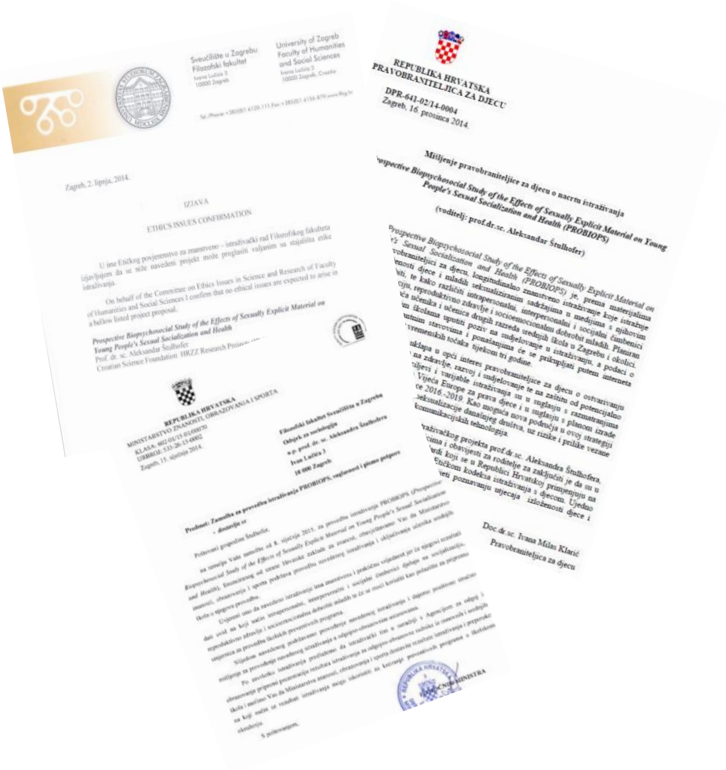
RIJEKA		
Wave	**Year**	**N**
1	2015	1287
2	2016	1281
3		1232
4	2017	1176
5		931
6	2018	892

Mean age (T1) = 15.9
44% M / 56% F

All 6 waves = 430

RECOMMENDATIONS (long before data collection)

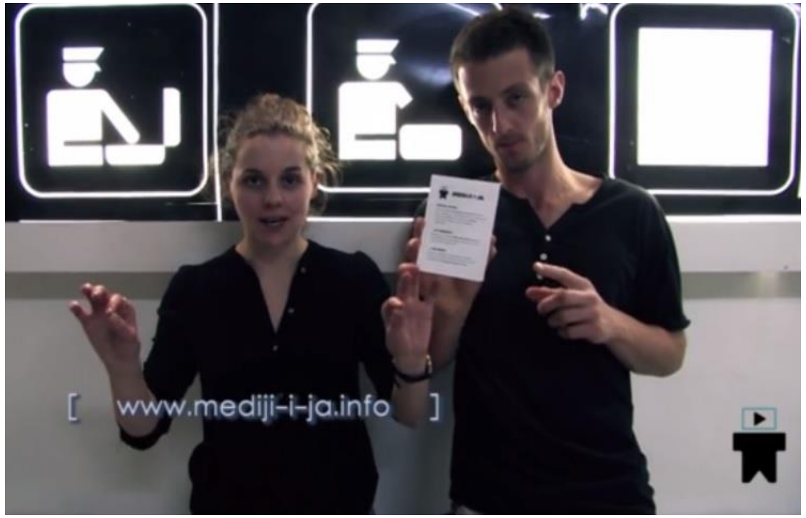
Obtaining approvals (e.g., relevant „gatekeepers”)


REPUBLIKA HRVATSKA
PRAVOBRANITELJICA ZA DJECU
IZJAVA
ETHICS ISSUES CONFIRMATION

Developing a catchy public name and an attractive visual identity
+ feedback (e.g., focus groups)

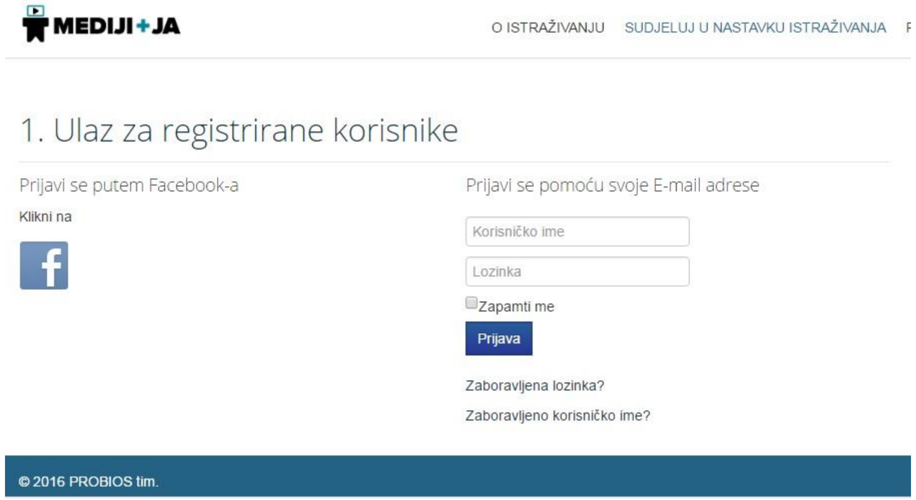
MEDIJI + JA

Developing a „recruitment” leaflet and video tutorial



RECOMMENDATIONS (long before data collection)

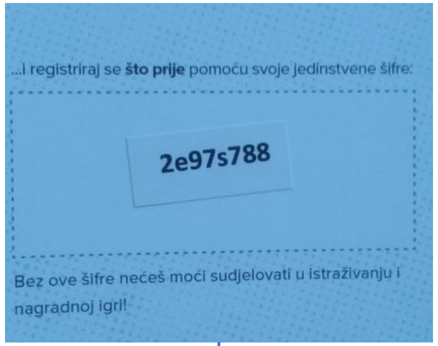
Setting up a registration website and social media sites



Deciding on incentives model (e.g, lottery based) + feedback

ZAGREB	
Wave	**Collected**
1	27%
2	57%
3	63%
4	61%
5	67%
6	62%

System for assuring confidentiality (separate database for contact information and questionnaire data + linking database)



	A	B	C	D	E	F
1	ID	full_resp	pages	Token	token_group	school
2	13	1	13	rdkxkcm7	14	1
3	18	1	13	ckxrsrnc	8	1
4	20	1	13	p6kvq2pr	14	1
5	22	1	13	7r6z7sz4	1	3
6	24	1	13	dppzcvny	80	3
7	38	1	13	bruzuiva	4	3

A brief detour...INCENTIVES

Types of incentives

- An incentive which shows respect for participants' time and effort
- Money, gift cards, food vouchers, school supplies, telephone cards, etc.

Determining adequate incentive

- Incentive amounts vary depending on many factors, including:
  - Study budget
  - Standard of living in the study country
  - Population of interest
  - Institutional or governmental policies (monetary incentives not allowed, pre-established cap amount for incentives)

Models

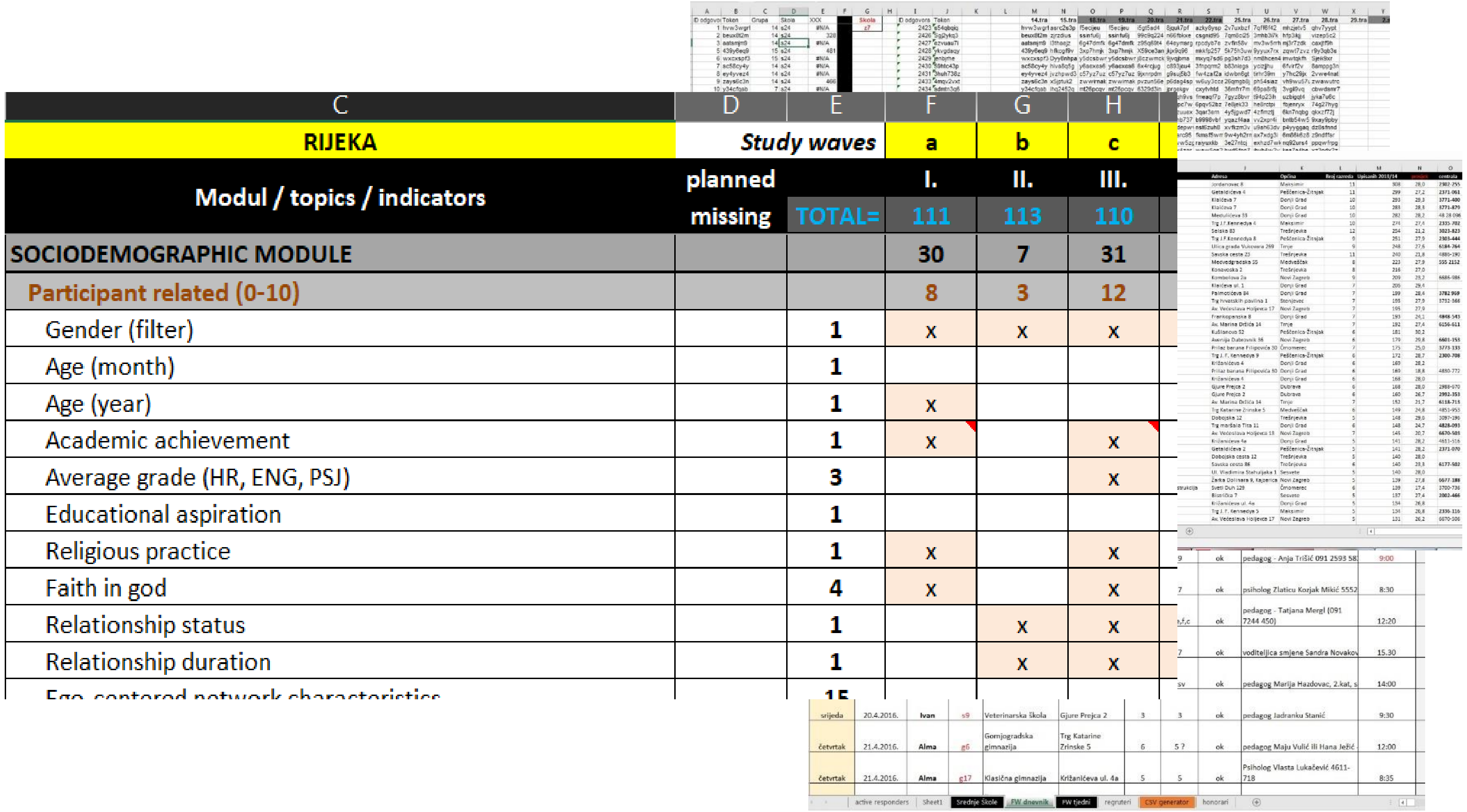
1. Each participant
2. Each participant + extra for participating in each subsequent wave
3. One-price lottery
4. Horizontal lottery (a number of awards, same incentive amount)
5. Pyramidal lottery (a number of awards, increasing incentive amount)
6. Combining previous models

Acquire feedback!

RECOMMENDATIONS (before data collection)

Training a fieldwork force

Developing necessary planning/tracking sheets
(coordinating, contacting, and measures!)



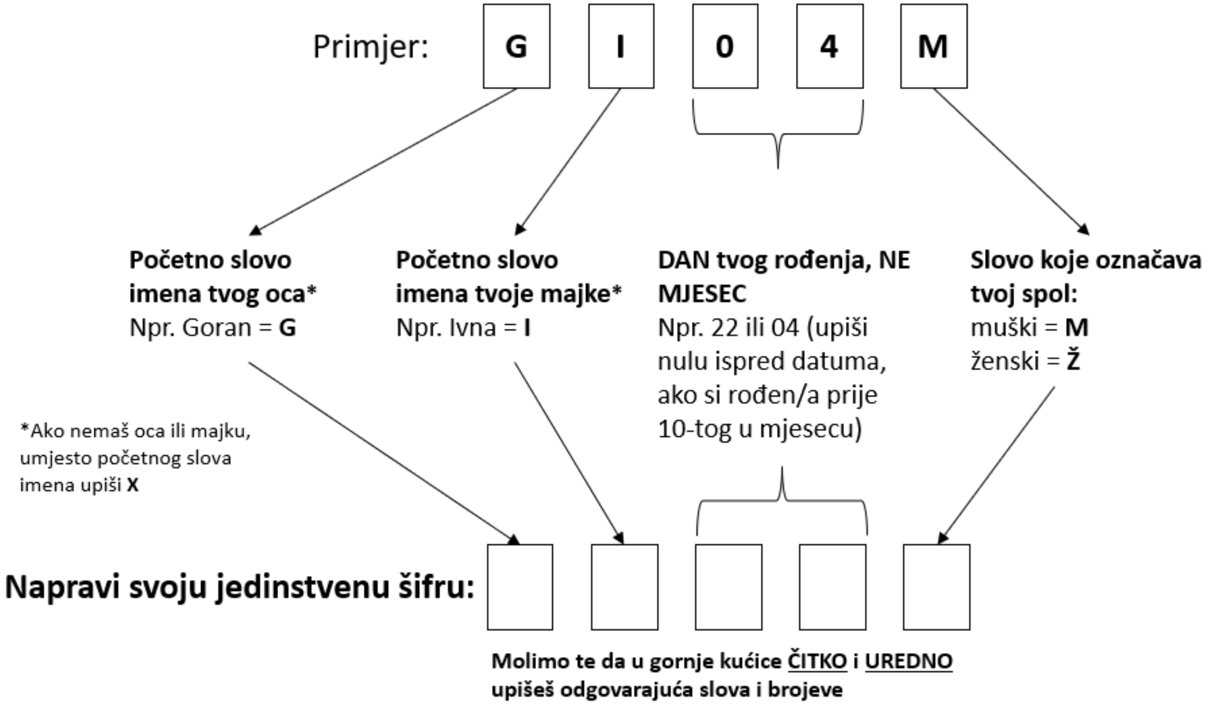
C	D	E	F	G	H
RIJEKA	Study waves		a	b	c
Modul / topics / indicators	planned missing	TOTAL=	I. 111	II. 113	III. 110
SOCIODEMOGRAPHIC MODULE			30	7	31
Participant related (0-10)			8	3	12
Gender (filter)		1	x	x	x
Age (month)		1			
Age (year)		1	x		
Academic achievement		1	x		x
Average grade (HR, ENG, PSJ)		3			x
Educational aspiration		1			
Religious practice		1	x		x
Faith in god		4	x		x
Relationship status		1		x	x
Relationship duration		1		x	x
Ego-centered network characteristics		15			

RECOMMENDATIONS (during data collection)

Classroom-based data collection

Use privacy panels

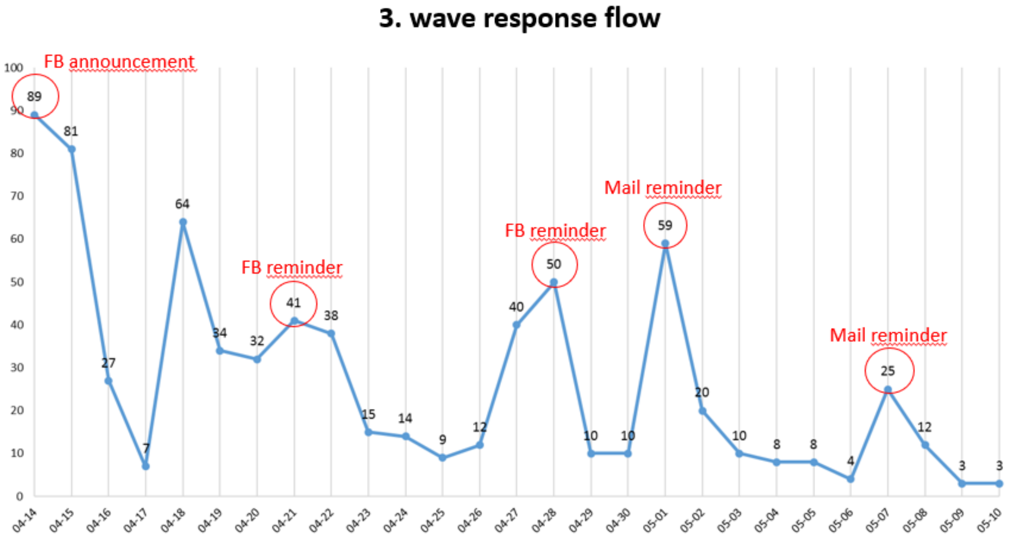
Develop coding system for linking participants across multiple study waves



RECOMMENDATIONS (during data collection)

Response tracking

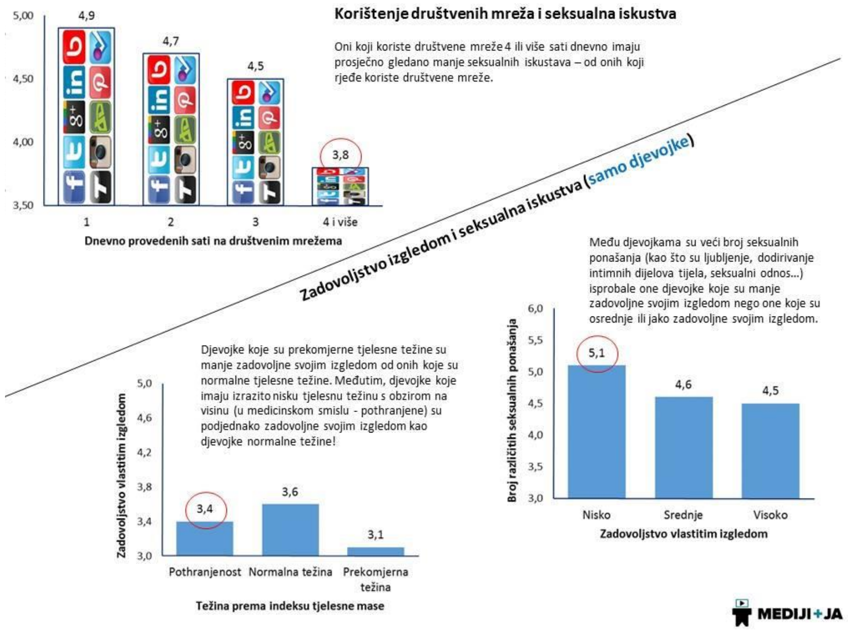
Issues: rarely checking email, changing email address, using „secondary" email for the initial registration



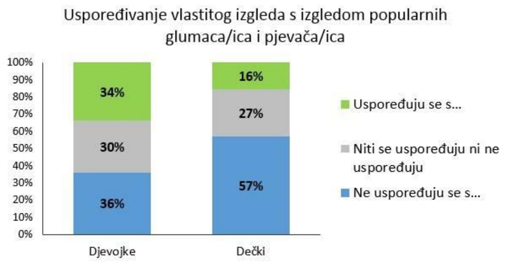
Fieldwork: 14.04. - 06.05. (13 work days)

Maintaining communication before/during/after data collection periods

- Repeated in-person visits
- Social media posts with interesting results
- Social media and e-mail announcements
- Social media and e-mail reminders



Rezultati analize pokazuju da je 15% djevojaka nezadovoljno svojim fizičkih izgledom.



Djevojke više uspoređuju svoj izgled s izgledom popularnih glumica, pjevačica i plesačica od svojih muških vršnjaka. Zanimljivo je da od 34% posto djevojaka koje su sklone uspoređivanju, najveći broj njih (41%) provodi 6 ili više sati dnevno na društvenim mrežama i gledajući razne serije i filmove. Istovremeno, među djevojkama koje **ne** uspoređuje svoj izgled s izgledom raznih popularnih osoba najveći broj ih je zadovoljno svojim fizičkim izgledom.

RECOMMENDATIONS (during data collection)

Maintaining communication before/during/after data collection periods

- Repeated in-person visits

1. wave		2. wave		3. Wave	
Schools	**Respondents**	Visited	Respondents	Visited	Respondents
59	**2210**	35	542 (M* = 32%)	31	601 (M* = 39%)
		Not visited	Respondents	Not visited	Respondents
		24	68 (M* = 15%)	28	124 (M* = 21%)
		Schools	**Respondents**	**Schools**	**Respondents**
		59	**610**	**59**	**725**
			„in-person effect”		**„in-person effect”**
			+17%		**+18%**

*M = average response rate in (not)visited schools based on the number of baseline respondents

RECOMMENDATIONS (during data collection)

Qualitative feedback (intention to drop-out, satisfaction with incentives, etc.)

BARRIERS	IVANIĆ GRAD	SESVETE	ZAGREB
Long time Intervals and forgetfulness	✓		
Rare communication with participants, lack of reminders	✓	✓	
Image research too laid back. Unrecognized seriousness and importance of research	✓		
Prizes are not particularly motivating			✓
Use of e-mail compared to Facebook, WhatsApp or similar		✓	✓
Immaturity (boys)			✓

RECOMMENDATIONS AND SUGGESTIONS:	IVANIĆ GRAD	SESVETE	ZAGREB
Joining the Facebook group	✓		
Frequent e-mails (though rarely checked)	✓	✓	
More content on the Facebook group	✓		
Be sure to visit schools	✓		✓
Completing the questionnaire during class	✓	✓	✓
emphasize prices		✓	
Create an impression of obligation to an adult at school (teacher, psychologist ...)			✓
Some will be more interested if you have „dirty” questions		✓	

RECOMMENDATIONS (during/after data collection)

Document sampling flow

ZAGREB	Data collection dates	Total sample size	Sample size after dataset cleaning	Sample size in MASTER data
ZG W1	10 April - 11 May 2015	2655	2241	2235
ZG W2	10 Nov - 27 Nov 2015	680	644	636
ZG W3	14 April - 6 May 2016	766	727	711
ZG W4	7 Oct - 28 Oct 2016	739	692	683
ZG W5	15 Mar - 27 Mar 2017	761	693	686
ZG W6	17 Sep - 2 Oct 2017	542	517	511

ZAGREB - Number of participants in all previous waves (linked)				
w1 = 2235	w12 = 636	w123 = 486	w1234 = 417	w12345 = 372
w2 = 636	w13 = 711	w124 = 462	w1235 = 400	w123456 = 307
w3 = 711	w14 = 683	w125 = 448	w1245 = 397	
w4 = 683	w15 = 686	w134 = 534	w1345 = 455	
w5 = 686	w23 = 486	w135 = 522	w2345 = 372	
w6 = 511	w24 = 462	w145 = 520		
	w25 = 448	w234 = 417		
	w34 = 534	w235 = 400		
	w35 = 522	w245 = 397		
	w45 = 520	w345 = 455		

ZAGREB - Participared in: (number of waves)				
only 1 wave	1178	53%	at least 1 wave	2235
only 2 waves	273	12%	any 2 waves	1057
only 3 waves	172	8%	any 3 waves	784
only 4 waves	145	6%	any 4 waves	612
only 5 waves	160	7%	any 5 waves	467
only 6 waves	307	14%	all 6 waves	307
TOTAL	2235	100%		

RIJEKA	Data collection dates	Total sample size	Sample size after dataset cleaning	Sample size in MASTER data
RI W1	7 Dec 2015 - 1 Feb 2016	1307	1291	1287
RI W2	18 April - 13 May 2016	1309	1283	1281
RI W3	7 Oct - 27 Oct 2016	1252	1233	1232
RI W4	13 Mar - 12 Apr 2017	1202	1177	1176
RI W5	2 Oct - 3 Nov 2017	944	931	931
RI W6	5 Mar - 30 Mar 2018	924	892	892

RIJEKA - Number of participants in all previous waves (linked)						Unique
w1 = 1287	w12 = 1059	w123 = 883	w1234 = 758	w12345 = 534	w123456 = 430	w1u = 69
w2 = 1281	w13 = 1007	w124 = 862	w1235 = 588	w12346 = 516		w2u = 68
w3 = 1232	w14 = 977	w125 = 665	w1236 = 582	w12356 = 473		w3u = 49
w4 = 1176	w15 = 757	w126 = 661	w1245 = 592	w12456 = 481		w4u = 46
w5 = 931	w16 = 746	w134 = 850	w1246 = 578	w13456 = 476		w5u = 38
w6 = 892	w23 = 1012	w135 = 665	w1256 = 534	w23456 = 469		w6u = 21
	w24 = 968	w136 = 651	w1345 = 596			TOTAL = 291
	w25 = 744	w145 = 662	w1346 = 571			
	w26 = 735	w146 = 641	w1356 = 531			
	w34 = 968	w156 = 599	w1456 = 531			
	w35 = 756	w234 = 846	w2345 = 585			
	w36 = 737	w235 = 654	w2346 = 562			
	w45 = 751	w236 = 643	w2356 = 521			
	w46 = 716	w245 = 653	w2456 = 525			
	w56 = 696	w246 = 631	w3456 = 526			
		w256 = 589				
		w345 = 660				

RIJEKA - Participared in: (number of waves)				
only 1 wave	291	17%	at least 1 wave	1744
only 2 waves	164	9%	any 2 waves	1453
only 3 waves	205	12%	any 3 waves	1289
only 4 waves	285	16%	any 4 waves	1084
only 5 waves	369	21%	any 5 waves	799
all 6 waves	430	25%	all 6 waves	430
TOTAL	1744	100%		

	ZAGREB	RIJEKA
w1	spring, 2015, 2. class	autumn, 2015, 2. class
w2	autumn, 2015, 3. class	spring, 2016 2. class
w3	spring, 2016, 3. class	autumn, 2016, 3. class
w4	autumn, 2016, 4. class	spring, 2017 3. class
w5	spring, 2017, 4. class	autumn, 2017, 4. class
w6	autumn, 2017, out of school	spring, 2018, 4. class

RECOMMENDATIONS (during/after data collection)

Are we losing the most relevant cases first? (attrition)

- In longitudinal research, losing particular types of participants over the course of the study may become a serious analytical issue (e.g., identifying moderating effects, diminishing or inflating links between predictors and outcomes of interest).
  - *Štulhofer et al. (2021). Selective Dropout in Longitudinal Studies of Adolescent Pornography. Archives of sexual behavior, 50, 2215–2226.*
- **Using two independent panel samples, we examined:**
  1. Was attrition substantially different among adolescents who may be particularly vulnerable to pornography use compared to other participants?
     - Vulnerability indicators (measured at the baseline): adverse family situation, lower academic achievement, early biological maturation, lower self-esteem, sexual aggressiveness, earlier sexual debut.
  2. Did panel type (online vs. classroom-based) moderate associations between attrition and the vulnerable group membership?

RECOMMENDATIONS (during/after data collection)

Are we losing the most relevant cases first? (attrition)

- Based on attrition patterns in two panels, we distinguished: **early attrition, later attrition, and participation gaps**.

RESULTS

1. Only early attrition was substantially higher among more vulnerable adolescents, compared with other participants.
2. Panel type moderated the associations between adolescent vulnerability and participation gaps, which was significant for the classroom-based but not the online panel.

Adolescents who are believed to be under increased risk of adverse outcomes associated with pornography use are less likely to complete longitudinal studies.

RECOMMENDATIONS (during/after data collection)

Are we losing the most relevant cases first? (attrition)

Pre-designed attrition reducing strategies (examples)

Modality of data collection

- Resources and required baseline sample
- Online data collections platforms vs. cell phone app

Preparations for attrition

- Short questionaries (and planned missing)
- Study's visual identity and presence
- Desirable incentives
- Focus groups (before and during data collection)

Delaying selective dropout

- Notifying participants about an upcoming study wave
- Communicating simple but interesting findings
- Adding or modifying incentives (e.g., adding bonus incentives tied to the number of waves completed)
- Seeding the panel with specially incentivized and committed peer leaders

RECOMMENDATIONS (during/after data collection)

Are we losing the most relevant cases first? (attrition)

A simple analytic approach to assess attrition

For example, assessing attrition from T1 to T2

- N (T1, baseline) = 100
- N (T2) = 75

Binary logistic regression analysis

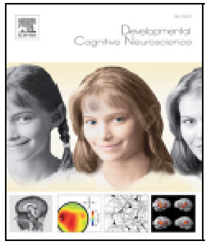
- Which participants have higher odds for dropping out?
- **Use T1 data**
- **DV**
    - 0 = Participants in T2 (75)
    - 1 = Lost to follow-up (25)
- **IV**
    - Relevant predictors of attrition (age, gender, etc.)

CHOOSING AN ANALYSIS FRAMEWORK

Contents lists available at ScienceDirect

Developmental Cognitive Neuroscience

journal homepage: www.elsevier.com/locate/dcn



Check for updates

The Hitchhiker's guide to longitudinal models: A primer on model selection for repeated-measures methods

Ethan M. McCormick [a,b,c,*], Michelle L. Byrne [d,e], John C. Flournoy [f], Kathryn L. Mills [e], Jennifer H. Pfeifer [e]

[a] Methodology & Statistics Department, Institute of Psychology, Leiden University, Leiden, Netherlands
[b] Department of Psychology and Neuroscience, University of North Carolina, Chapel Hill, United States
[c] Cognitive Neuroscience Department, Donders Institute for Brain, Cognition and Behavior, Radboud University Medical Center, Nijmegen, Netherlands
[d] Turner Institute for Brain and Mental Health, School of Psychological Sciences, Monash University, Clayton, Australia
[e] Department of Psychology, University of Oregon, Eugene, United States
[f] Department of Psychology, Harvard University, Cambridge, United States

Choosing an analysis framework

Two general modeling frameworks

Multilevel (mixed-effect / hierarchical) modeling

- Estimating higher levels of nesting (e.g., beyond individual)
- Limited with respect to measurement error in predictors or outcomes
- Simple inclusion of multiple time-variant covariates (e.g., relation satisfaction) and time-invariant covariates (e.g., gender)
- Relative model fit indices (AIC/BIC and likelihood ratio test) [model comparison]

Structural equation modeling (SEM)

- Repeated measures as multiple indicators on one or more latent factors
- Estimating and removing the effect measurement error in predictors or outcomes
- Absolute model fit indices (CFI, TLI, RMSEA)
- Mediated relationships between constructs

Similarities between the multilevel and SEM frameworks often outweigh the differences.

Choosing an analysis framework: key considerations

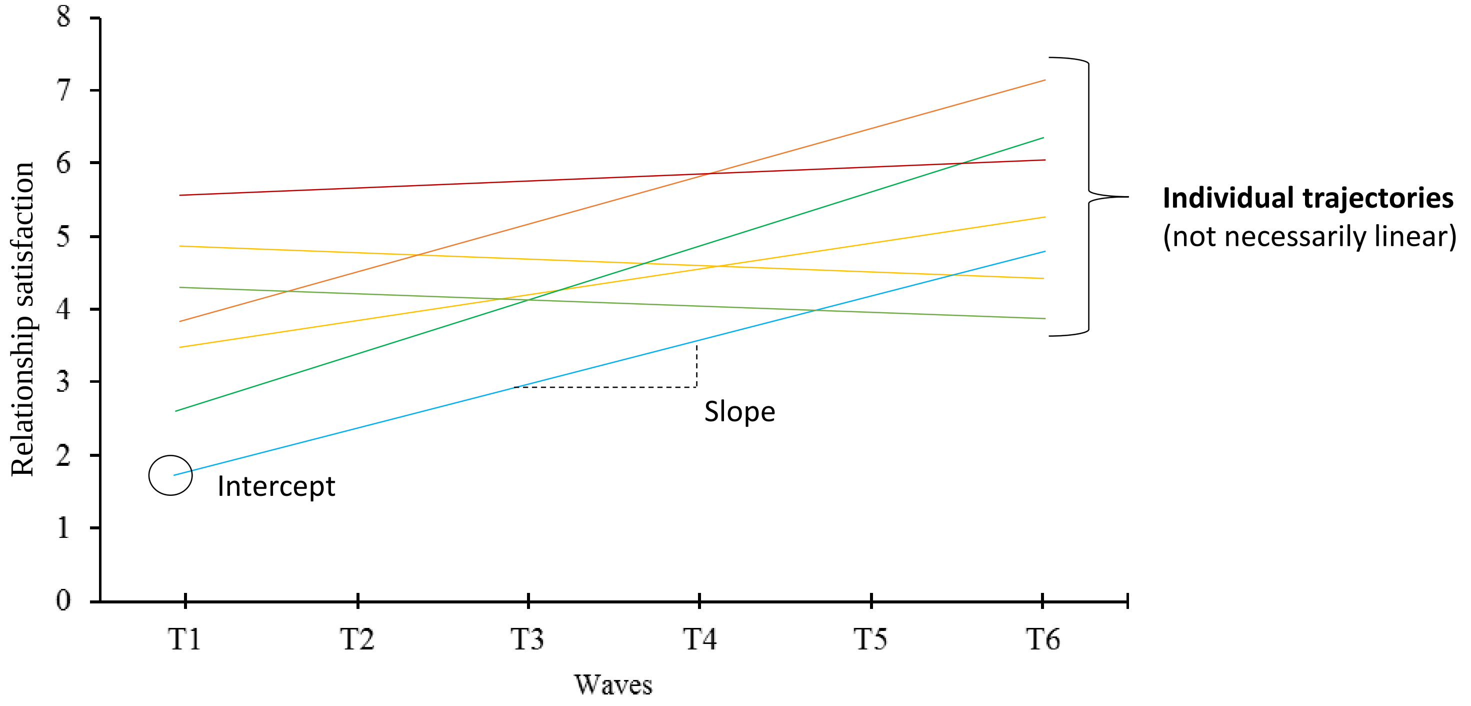
- Research question / hypothesis
- Variable type (categorical / quantitative) // (manifest / latent)
- Number of covariates
- Type of covariates (time-invariant / time-variant)
- (Un)balanced data (unequally spaced measurement occasions and/or missing data)
- Type of change (growth curve)
- Higher-order nesting
- <u>Software</u>

SEM framework example: Latent Growth Curve Modeling

- Enables an assessment of <u>between-person differences</u> over time by estimating <u>within-person latent trajectories of change</u>
  - Observed repeated measures of a construct are represented by two latent factors (latent intercept and latent slope), and their means and variances
  - Latent intercept = initial level of a measured construct
  - Latent slope = measured construct’s change over time

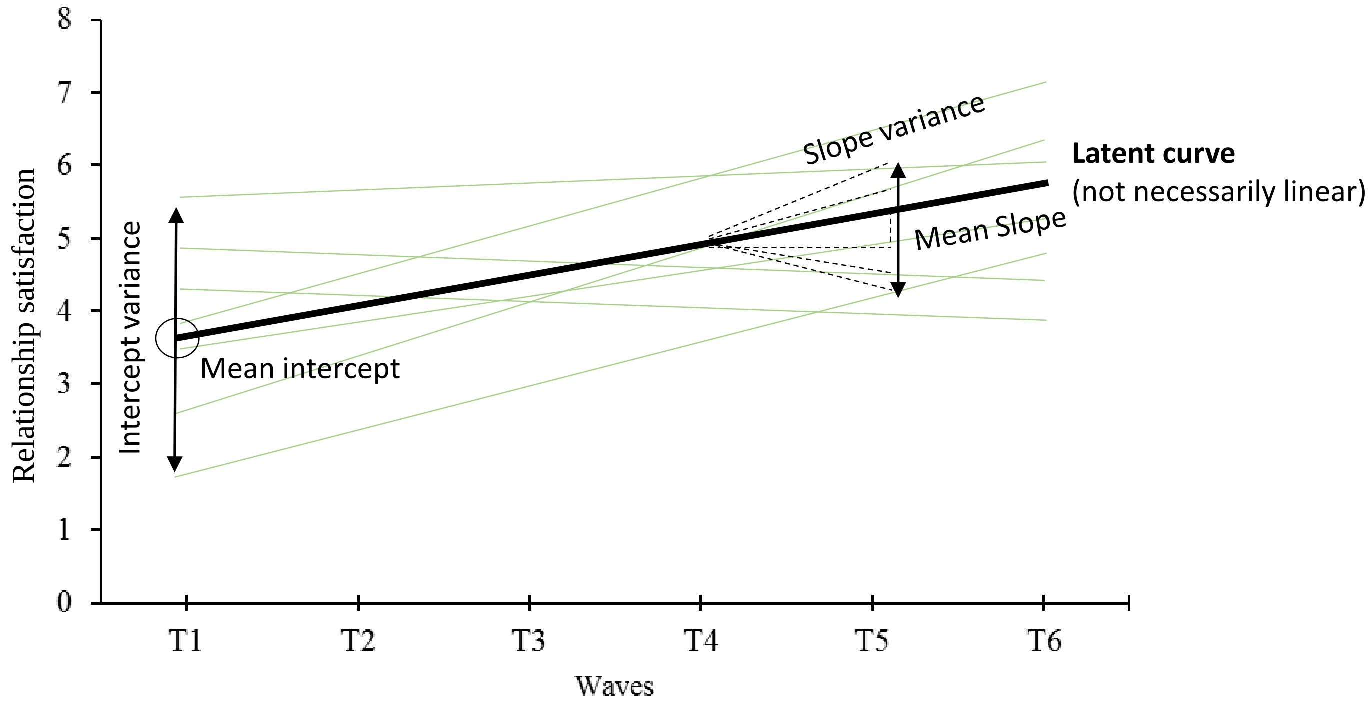
SEM framework example: Latent Growth Curve Modeling

Assessing group means and between-person differences over time



SEM framework example: Latent Growth Curve Modeling

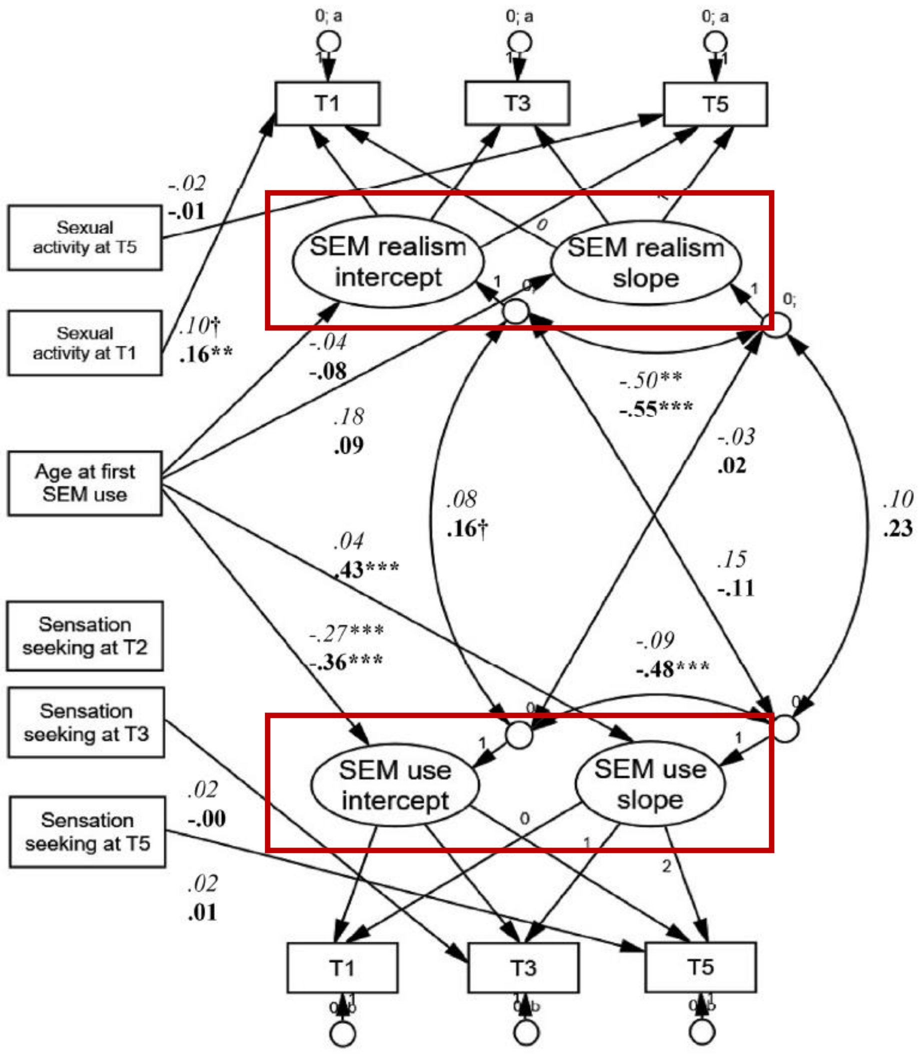
Estimating between-person differences in <u>within-person change</u>
over time using **latent curve** and its **intercept** and **slope**



SEM framework example: Latent Growth Curve Modeling

Advantages

- Assessing multiple constructs simultaneously (parallel LGCM)
- Ability to handle unequally spaced measurement occasions, nonlinear trajectories, and partially missing data
- Flexibility of including both time-invariant and time-varying covariates



Wright, P. J., & Štulhofer, A. (2019). Adolescent pornography use and the dynamics of perceived pornography realism: Does seeing more make it more realistic? *Computers in Human Behavior*, *95*, 37–47. https://doi.org/10.1016/j.chb.2019.01.024

SEM framework example: Latent Growth Curve Modeling

Interpretations of **positive** correlations between two latent constructs:

Construct B - SLOPE	**Construct A - SLOPE**		**Construct A - INTERCEPT**
	Increasing trend	Decreasing trend	
Increasing trend	The higher the increase in construct A, the more substantial the increase in construct B	The higher the increase in construct B, the less substaintal the decrease in construct A	The higher the baseline assessment of construct A, the **more** substantial the increase in construct B over time
Decreasing trend	The higher the increase in construct A, the less substaintal the decrease in construct B	The steeper the decrease in construct A, the more substantial the decrease in construct B (alternatively – both are decreasing less steeply)	The higher the baseline assessment of construct A, the **less** substantial the decrease in construct B over time

Interpretations of **negative** correlations between two latent constructs:

Construct B - SLOPE	**Construct A - SLOPE**		**Construct A - INTERCEPT**
	Increasing trend	Decreasing trend	
Increasing trend	The higher the increase in construct A, the less substantial the increase in construct B	The higher the increase in construct B, the more substaintal the decrease in construct A	The higher the baseline assessment of construct A, the **less** substantial the increase in construct B
Decreasing trend	The higher the increase in construct A, the more substantial the decrease in construct B	The steeper the decrease in construct A, the less substantial the decrease in construct B	The higher the baseline assessment of construct A, the **more** substantial the decrease in construct B

Final remark...

Common statement („mantra”) in research papers:

More longitudinal research is needed.

Time/effort/costs **vs.** sound empirical/theorical contribution

LITERATURE

- Curran, P. J., Obeidat, K., & Losardo, D. (2010). Twelve Frequently Asked Questions About Growth Curve Modeling. Journal of cognition and development : official journal of the Cognitive Development Society, 11(2), 121–136. https://doi.org/10.1080/15248371003699969
- L'Engle, K. L., Pardun, C. J., & Brown, J. D. (2004). Accessing Adolescents: A School-Recruited, Home-Based Approach to Conducting Media and Health Research. The Journal of Early Adolescence, 24(2), 144–158. https://doi.org/10.1177/0272431603262668
- McCormick, E. M., Byrne, M. L., Flournoy, J. C., Mills, K. L., & Pfeifer, J. H. (2023). The Hitchhiker's guide to longitudinal models: A primer on model selection for repeated-measures methods. Developmental cognitive neuroscience, 63, 101281. https://doi.org/10.1016/j.dcn.2023.101281
- Ployhart, R. E., & Vandenberg, R. J. (2010). Longitudinal Research: The Theory, Design, and Analysis of Change. Journal of Management, 36(1), 94-120. https://doi.org/10.1177/0149206309352110
- Ployhart, R. E., & Ward, A.-K. (2011). The “quick start guide” for conducting and publishing longitudinal research. Journal of Business and Psychology, 26(4), 413–422. https://doi.org/10.1007/s10869-011-9209-6
- Štulhofer, A., Matković, T., Kohut, T., Koletić, G., Buško, V., Landripet, I., & Vodopijevec, A. (2021). Are We Losing the Most Relevant Cases First? Selective Dropout in Two Longitudinal Studies of Adolescent Pornography Use. Archives of sexual behavior, 50(5), 2215–2226. https://doi.org/10.1007/s10508-021-01931-y