

Examining Family Functioning at Different Levels with Purely Dyadic Measures

Lara Stas ¹
William L. Cook ²
Tom Loeys ¹

¹Department of Data Analysis, Ghent University, Belgium

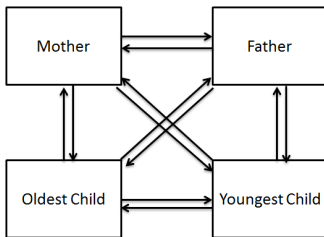
²University of New England, United States

Outline

- 1 The Social Relations Model (Traditional)
 - Theoretical Framework & Design
 - Analysis
- 2 Purely Dyadic SRM
 - Model & Design
 - Results Co-Activity Study
- 3 Compare both models
 - Identical Results?
 - Etiology difference
 - Conclusion

The Social Relations Model (Kenny & La Voie, 1984)

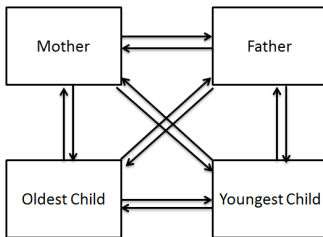
- Disentangles family dynamics at three different levels
- Round robin design



- Co-Activity Study
 - Separately complete on line questionnaire
 - *How often have you and ... watched TV?*
(1 = not at all in the last month, 7 = more than once a day)

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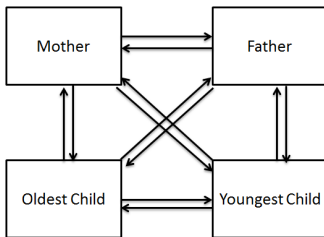
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Mother, how often have you and father watched TV together?

Unravel observed scores at 3 different levels:

		Estimate	Std.err	Z-value	P(> z)		Estimate	Std.err	Z-value	P(> z)	
	Intercepts:						Variations:				
Family level	m. FE	4.057	0.162	25.085	0.000		VAR. F	1.002	0.254	3.938	0.000
	m. A. O	-0.105	0.116	-0.903	0.367		VAR. A. O	0.818	0.229	3.574	0.000
	m. A. Y	0.253	0.105	2.407	0.016		VAR. A. Y	0.576	0.177	3.258	0.001
Individual level	m. A. M	-0.045	0.106	-0.426	0.670		VAR. A. M	0.587	0.175	3.348	0.001
	m. A. F	-0.102	0.095	-1.076	0.282		VAR. A. F	0.393	0.143	2.739	0.006
	m. P. O	-0.165	0.071	-2.323	0.020		VAR. P. O	0.208	0.086	2.417	0.016
	m. P. Y	0.028	0.058	0.473	0.636		VAR. P. Y	0.065	0.058	1.119	0.263
	m. P. M	0.175	0.069	2.540	0.011		VAR. P. M	0.207	0.080	2.606	0.009
	m. P. F	-0.037	0.062	-0.607	0.544		VAR. P. F	0.077	0.065	1.187	0.235
Dyadic level	m. R. O. Y	0.121	0.059	2.046	0.041		VAR. R. O. Y	0.469	0.143	3.274	0.001
	m. R. O. M	-0.007	0.054	-0.123	0.902		VAR. R. O. M	0.363	0.129	2.809	0.005
	m. R. O. F	-0.114	0.056	-2.038	0.042		VAR. R. O. F	0.359	0.124	2.889	0.004
	m. R. Y. O	0.236	0.062	3.782	0.000		VAR. R. Y. O	0.645	0.170	3.784	0.000
	m. R. Y. M	-0.124	0.049	-2.526	0.012		VAR. R. Y. M	0.108	0.089	1.213	0.225
	m. R. Y. F	-0.112	0.055	-2.019	0.043		VAR. R. Y. F	0.301	0.111	2.704	0.007
	m. R. M. O	-0.167	0.054	-3.106	0.002		VAR. R. M. O	0.221	0.098	2.255	0.024
	m. R. M. Y	-0.059	0.052	-1.148	0.251		VAR. R. M. Y	0.199	0.094	2.126	0.034
	m. R. M. F	0.226	0.063	3.567	0.000		VAR. R. M. F	0.654	0.173	3.783	0.000
	m. R. F. O	-0.069	0.055	-1.262	0.207		VAR. R. F. O	0.367	0.120	3.057	0.002
	m. R. F. Y	-0.062	0.053	-1.162	0.245		VAR. R. F. Y	0.308	0.111	2.761	0.006
	m. R. F. M	0.131	0.057	2.286	0.022		VAR. R. F. M	0.423	0.139	3.053	0.002

Mother, how often have you and father watched TV together?

Unravel observed scores at 3 different levels:

- 1 Family effect
i.e., Group effect

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Unravel observed scores at 3 different levels:

2 Individual level

- Actor effect

i.e., Cross-relational consistency of the rater

- Partner effect

i.e., Cross-relational consistency about person being rated

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Mother, how often have you and father watched TV together?

Unravel observed scores at 3 different levels:

- ③ Dyadic level:
 - Relationship effects

i.e., Unique adaptation of one person towards another,
 controlled for both actor and partner effects

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Confirmatory Factor Analysis

SRM components are typically specified as latent variables in a CFA.

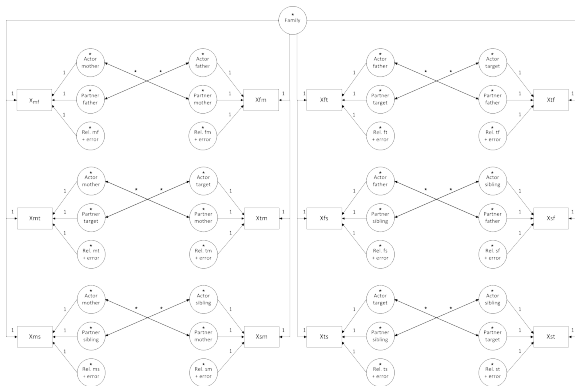
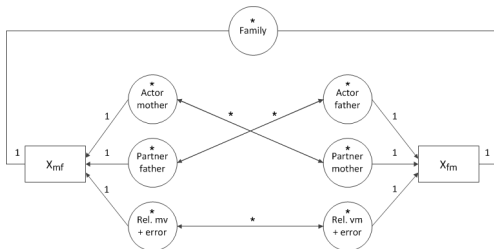



Figure: Boxes represent observed dyadic measurements, circles latent variables. Parameters that are fixed are indicated by '1', free parameters by an asterisk. Every indicator is connected with the corresponding latent variable by a single headed arrow. Double headed arrows represent reciprocities.



Each dyadic measure is constituted by a linear combination:

$$X_{ijk} = \mu_k + \alpha_{ik} + \beta_{jk} + \gamma_{ijk} + \epsilon_{ijk}$$

- μ = family effect
- α_i = actor effect
- β_j = partner effect
- γ_{ij} = relationship effect
- ϵ_{ijk} = measurement error
- i = role of the rater
- j = role of the person being rated
- k = family ID



Rel. fm
+ error

Mother rating father:

$$X_{mfk} = \mu_k + \alpha_{mk} + \beta_{fk} + \gamma_{mfk} + \epsilon_{mfk}$$

Remarks

- Directed SRM
 - Score contains individual participant's subjective perspective
- **BUT** Co-activity is a purely dyadic construct
 - Expect same score both members
 - ⇒ Not useful to look at actor and partner effects
- Solution?
 - Purely Dyadic SRM

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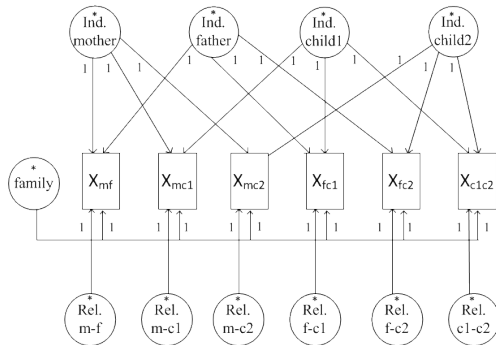
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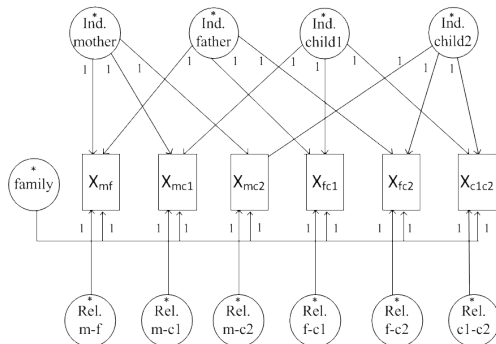
Co-Activity Study:

- Stage 1: on line questionnaire
= Directed score
 - Stage 2: Home visit:
 - Reach a consensus
How much have they really watched TV together?
= Purely dyadic score
- ⇒ New model:
Purely Dyadic SRM

Purely Dyadic SRM



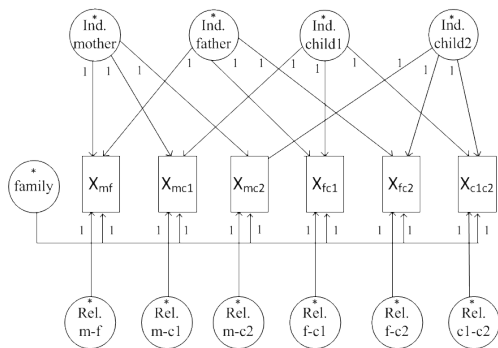
Boxes represent observed dyadic measurements, circles latent variables. Parameters that are fixed are indicated by '1', free parameters by an asterisk. Every indicator is connected with the corresponding latent variables by an arrow.



$$X_{ijk} = \nu_k + \theta_{ik} + \theta_{jk} + \kappa_{ijk} + \epsilon_{ijk}$$

- ν_k = family effect
- θ_i = individual effect
- κ_{ij} = relationship effect
- ϵ_{ijk} = measurement error

- i = role of the first person in the dyad
- j = role of the second person in the dyad
- k = family ID



Consensus Score:

$$X_{mfk} = \nu_k + \theta_{mk} + \theta_{fk} + \kappa_{mfk} + \epsilon_{mfk}$$

$$X_{fmk} = \nu_k + \theta_{mk} + \theta_{fk} + \kappa_{mfk} + \epsilon_{mfk}$$

Results

- Important components at all three levels
- Family culture important in explaining how often dyads watch TV together
- Mothers consistently watch more TV with *all* others
- TV watching behavior is relation specific

	Estimate	Std. err	Z-value	P(> z)		Estimate	Std. err	Z-value	P(> z)
Intercepts:					Variances:				
m. FE	3.733	0.169	22.042	0.000	VAR. F	1.125	0.269	4.178	0.000
m. I. M	0.160	0.078	2.055	0.040	VAR. I. M	0.187	0.097	1.924	0.054
m. I. F	-0.140	0.093	-1.504	0.133	VAR. I. F	0.442	0.143	3.101	0.002
m. I. O	-0.110	0.082	-1.348	0.178	VAR. I. O	0.246	0.094	2.622	0.009
m. I. Y	0.090	0.063	1.434	0.152	VAR. I. Y	-0.021	0.057	-0.363	0.717
m. R. MF	0.307	0.062	4.923	0.000	VAR. R. MF	0.807	0.209	3.865	0.000
m. R. MO	-0.143	0.045	-3.201	0.001	VAR. R. MO	0.169	0.092	1.833	0.067
m. R. MY	-0.163	0.048	-3.428	0.001	VAR. R. MY	0.273	0.103	2.658	0.008
m. R. FO	-0.163	0.048	-3.428	0.001	VAR. R. FO	0.262	0.109	2.404	0.016
m. R. FY	-0.143	0.045	-3.201	0.001	VAR. R. FY	0.211	0.099	2.140	0.032
m. R. OY	0.307	0.062	4.923	0.000	VAR. R. OY	0.675	0.178	3.787	0.000

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Similar results directed and consensus scores?

- Same questions asked in both settings
- Compare both data sets
 - Naive approach:
 - Average directed scores for each dyad
 - ⇒ Data structure similar to consensus data
 - Results:
 - ⇒ No consensus between both models in 8 out of 22 comparisons
- ⇒ Etiology difference?
 - ⇒ Using the difference between directed and consensus data
 - ⇒ The study design (SRM vs. consensus)

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- Same questions asked in both settings
- Compare both data sets
 - Naive approach:
 - Average directed scores for each dyad
 - ⇒ Data structure similar to consensus data
 - Results:
 - No significant difference between both models in 2 out of 20 comparisons
- ⇒ Etiology difference?
 - Only one significant difference between both models
 - This difference is not significant in the consensus model

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 - Fit purely dyadic SRM on difference scores

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 - Fit purely dyadic SRM on difference scores

Similar results directed and consensus scores?

- Same questions asked in both settings
 - Compare both data sets
 - Naive approach:
Average directed scores for each dyad
⇒ Data structure similar to consensus data
 - Results:
 - No consensus between both models in 6 out of 22 components
- ⇒ Etiology difference?
- Compute difference scores (naive data – consensus data)
 - Fit purely dyadic SRM on difference scores

Results:

- All three levels of analyses are important
- In general, over report how much they actually watched TV
- Within generations they under report how much they watched TV together

	Estimate	Std.err	Z-value	P(> z)		Estimate	Std.err	Z-value	P(> z)
Intercepts:					Variances:				
FE (m, FE)	0.323	0.086	3.754	0.000	FE (VAR. F)	0.103	0.084	1.219	0.223
I.M (m, I.M)	-0.095	0.073	-1.297	0.195	I. (VAR. I.M)	0.143	0.055	2.575	0.010
I.F (m, I.F)	0.070	0.079	0.883	0.377	I. (VAR. I.F)	0.233	0.073	3.180	0.001
I.O (m, I.O)	-0.025	0.063	-0.399	0.690	I. (VAR. I.O)	0.238	0.075	3.183	0.001
I.Y (m, I.Y)	0.050	0.059	0.851	0.395	I. (VAR. I.Y)	0.191	0.069	2.784	0.005
R.MF (m, R.MF)	-0.128	0.037	-3.499	0.000	R. (VAR. R.MF)	0.064	0.059	1.098	0.272
R.MO (m, R.MO)	0.057	0.041	1.386	0.166	R. (VAR. R.MO)	0.178	0.079	2.265	0.024
R.MY (m, R.MY)	0.072	0.042	1.720	0.085	R. (VAR. R.MY)	0.273	0.091	2.993	0.003
R.FO (m, R.FO)	0.072	0.042	1.720	0.085	R. (VAR. R.FO)	0.282	0.099	2.848	0.004
R.FY (m, R.FY)	0.057	0.041	1.386	0.166	R. (VAR. R.FY)	0.339	0.105	3.225	0.001
R.OY (m, R.O)	-0.128	0.037	-3.499	0.000	R. (VAR. R.O)	0.261	0.101	2.589	0.010

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		Intercepts:				Variances:				
		Estimate	Std.err	Z-value	P(> z)	Estimate	Std.err	Z-value	P(> z)	
Family level	FE (m. FE)	0.323	0.086	3.754	0.000	FE (VAR. F)	0.103	0.084	1.219	0.223
	I.M (m. I.M)	-0.095	0.073	-1.297	0.195	I. (VAR. I.M)	0.143	0.055	2.575	0.010
Individual level	I.F (m. I.F)	0.070	0.079	0.883	0.377	I. (VAR. I.F)	0.233	0.073	3.180	0.001
	I.O (m. I.O)	-0.025	0.063	-0.399	0.690	I. (VAR. I.O)	0.238	0.075	3.183	0.001
	I.Y (m. I.Y)	0.050	0.059	0.851	0.395	I. (VAR. I.Y)	0.191	0.069	2.784	0.005
Dyadic level	R.MF (m. R.MF)	-0.128	0.037	-3.499	0.000	R. (VAR. R.MF)	0.064	0.059	1.098	0.272
	R.MO (m. R.MO)	0.057	0.041	1.386	0.166	R. (VAR. R.MO)	0.178	0.079	2.265	0.024
	R.MY (m. R.MY)	0.072	0.042	1.720	0.085	R. (VAR. R.MY)	0.273	0.091	2.993	0.003
	R.FO (m. R.FO)	0.072	0.042	1.720	0.085	R. (VAR. R.FO)	0.282	0.099	2.848	0.004
	R.FY (m. R.FY)	0.057	0.041	1.386	0.166	R. (VAR. R.FY)	0.339	0.105	3.225	0.001
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R.	(VAR. R.O)	0.261	0.101	2.589	0.010

In a nutshell:

Purely Dyadic SRM

- Highly advisable for purely dyadic constructs
- Traditional (directed) SRM
 - Not appropriate
 - Different results

References

Kenny, D. A., & La Voie, L. (1984). The social relations model. *Advances in Experimental Social Psychology*, 18, 141-182. [http://dx.doi.org/10.1016/S0065-2601\(08\)60144-6](http://dx.doi.org/10.1016/S0065-2601(08)60144-6)

Constraints on directed model:

- Consensus score
- ⇒ $I.X$
 $A.X = P.X = AP.X$
- ⇒ $Rel.XY = Rel.YX$
- ⇒ No generalized reciprocities