

A1. Annotated Mplus-Input for the CTC( $M-1$ ) model and the LD MTMM model  
comments to the input begin with an exclamation mark ("!")

A1.1 CTC( $M-1$ ) model

! title of the analysis

TITLE: CTC( $M-1$ ) model

! specification of the data file:

DATA: FILE = "dark\_triad.dat";

## A1.2 LD MTMM model

! title of the analysis

TITLE: LD MTMM model

! specification of the data file:

DATA: FILE = "dark\_triad.dat";

! List of variables in the data file (NAMES = ) and list of used variables (USEVARIABLES =)

VARIABLE:

NAMES =

SNAR1 SNAR2 SNAR3 PANAR1 PANAR2 PANAR3 FRNAR1 FRNAR2 FRNAR3

SMAC1 SMAC2 SMAC3 PAMAC1 PAMAC2 PAMAC3 FRMAC1 FRMAC2 FRMAC3

SPSY1 SPSY2 SPSY3 PAPSY1 PAPSY2 PAPSY3 FRPSY1 FRPSY2 FRPSY3;

USEVARIABLES =

SNAR1 SNAR2 SNAR3 PANAR1 PANAR2 PANAR3 FRNAR1 FRNAR2 FRNAR3

SMAC1 SMAC2 SMAC3 PAMAC1 PAMAC2 PAMAC3 FRMAC1 FRMAC2 FRMAC3

SPSY1 SPSY2 SPSY3 PAPSY1 PAPSY2 PAPSY3 FRPSY1 FRPSY2 FRPSY3;

ANALYSIS: ! TECHNICAL SPECIFICATION FOR THE ANALYSIS

TYPE = GENERAL; ! standard CFA / SEM specification

MODEL: ! Specification of the statistical model (here CTC(*M*-1)

! definition of the three indicator-specific trait-variables for Narcissism

NAR1 by SNAR1@1 PANAR1@1 FRNAR1@1;

NAR2 by SNAR2@1 PANAR2@1 FRNAR2@1;

NAR3 by SNAR3@1 PANAR3@1 FRNAR3@1;

! LD-factor for parent-report of Narcissism

LDPANAR by PANAR1@1 PANAR2 PANAR3;

! LD-factor for friend-report of Narcissism

LDFRNAR by FRNAR1 FRNAR2 FRNAR3;

! common factor narcissism

NAR by NAR1 NAR2 NAR3;

! Restricting intercepts to 0 to identify latent mean of NAR, NAR1, LDPANAR, LDFRNAR

[SNAR1@0];

[NAR1@0];

[PANAR1@0];

[FRNAR1@0];

! Calling for the latent means of NAR, LDPANAR, LDFRNAR

[NAR];

[LDPANAR];

[LDFRNAR];

! measurement invariance restriction for 2nd and 3rd indicator

[SNAR2 ENAD2 FNAD2](101);

[SNAR3 ENAR3 FNAR3](102);

! Specification of Machiavellianism (trait-variable)

MACH by SMAC1 PAMAC1@1 FRMAC1@1

SMAC2 PAMAC2 FRMAC2 (201)

SMAC3 PAMAC3 FRMAC3 (202);

! LD-factor for parent-report of Machiavellianism

LDPAMACH by PAMAC1 PAMAC2 PAMAC3;

! LD-factor for friend-report of Machiavellianism

LDFRMACH by FRMAC1 FRMAC2 FRMAC3;

! Restricting intercepts to 0 to identify latent means of MACH, LDPAMACH, LDFRMACH

[SMAC1@0];

[PAMAC1@0];

[FRMAC1@0];

! measurement invariance restriction for 2nd and 3rd indicator

[SMAC2 PAMAC2 FRMAC2] (211);

[SMAC3 PAMAC3 FRMAC3] (212);

! Calling for latent means of MACH, LDPAMACH, LDFRMACH

[MAC];

[LDPAMACH];

[LDFRMACH];

! Specification of Psychopathy (trait-variable)

PSY by SPSY1@1 PAPSY1@1 FRPSY1@1

SPSY2 PAPSY2 FRPSY2 (301)

SPSY3 PAPSY3 FRPSY3 (302);

! LD-factor for parent-report of Psychopathy

LDPAPSY by PAPSY1 PAPSY2 PAPSY3;

! LD-factor for friend-report of Psychopathy

LDFRPSY by FRPSY1 FRPSY2 FRPSY3;

! Restricting intercepts to 0 to identify latent means of PSY, LDPAPSY, LDFRPSY

[SPSY1@0];

[PAPSY1@0];

[FRPSY1@0];

! measurement invariance restriction for 2nd and 3rd indicator

[SMAC2 PAMAC2 FRMAC2] (311);

[SMAC3 PAMAC3 FRMAC3] (312);

! Calling for latent means of MACH, LDPAMACH, LDFRMACH

[MACH];

[LDPAMACH];

[LDFRMACH];

! Output options calling for standardized model parameters

OUTPUT: STDYX;

## A2. Building test parcels.

We used a stepwise procedure to build homogeneous test parcels (three per construct-method unit: TMU).

Step 1a: Exploratory Factor Analysis for self-report items of one trait with only 1 extracted factor, rank ordering of items according to their standardized loading parameters

Step 1b: repeat step 1a for parent reports

Step 1c: repeat step 1a for friend reports

Step 2: Compare rank ordering of all items according to their standardized factor loadings, minimally permute rank ordering to achieve exactly the same rank order across raters

Step 3: Build test parcels according to the following rationale:

	Item rank (according to standardized loading parameter)	Item rank (according to standardized loading parameter)	Item rank (according to standardized loading parameter)	Item rank (according to standardized loading parameter)	Sum of ranks
test parcel 1	1	6	7	12	26
test parcel 2	2	5	8	11	26
test parcel 3	3	4	9	10	26

These test parcels are in most applications homogenous representations of the same construct.

We acknowledge that the use of item parcels prohibits from drawing conclusions at the level of item. Item-level analyses would bear the advantage of being able to compare standardized loading parameters and inspect differential effects of items for the different types of raters.

A4. Formal definition (measurement models) of the CTC(M-1) and LD MTMM models. Trait, Reputation, and Identity components, Consistency and Method Specificity

	Model Equations	
Rater:	CTC(M-1) model	LD MTMM model
target / self-report ( $k=1$ )	$y_{ij1} = \alpha_{ij1} + \lambda_{ij1}T_j + \varepsilon_{ij1}$	$y_{ij1} = \alpha_{ij1} + \lambda_{ij1}T_j + \varepsilon_{ij1}$
Parent report ( $k=2$ )	$y_{ij2} = \alpha_{ij2} + \lambda_{Tij2}T_j + \lambda_{Mij2}MF_{j2} + \varepsilon_{ij2}$	$y_{ij2} = \alpha_{ij1} + \lambda_{Tij1}T_j + \lambda_{LDij2}LD_{j2} + \varepsilon_{ij2}$
Friend report ( $k=3$ )	$y_{ij3} = \alpha_{ij1} + \lambda_{Tij3}T_j + \lambda_{MFij3}MF_{j3} + \varepsilon_{ij3}$	$y_{ij3} = \alpha_{ij1} + \lambda_{Tij1}T_j + \lambda_{LDij3}LD_{j3} + \varepsilon_{ij3}$
Trait / Identity	$T_j$	$T_j$
Reputation	$Cor(MF_{j2}, MF_{j3})$	
Consistency	$Con(Y_{ijk}) = \frac{\lambda_{Tijk}^2 Var(T_j)}{\lambda_{Tijk}^2 Var(T_j) + \lambda_{Mijk}^2 Var(M_{ijk})}$	--
Method-Specificity	$MS(Y_{ijk}) = \frac{\lambda_{Mijk}^2 Var(M_{ijk})}{\lambda_{Tijk}^2 Var(T_j) + \lambda_{Mijk}^2 Var(M_{ijk})}$	--

*Notes.* The model equation are presented as general measurement equations. In order to identify, common identification restrictions of confirmatory factor analysis have to be imposed.  $y_{ijk}$  : response variable  $y$  being indicator  $i$  for trait  $j$  measured by method  $k$ . T: Trait variable; I: (Identity) and R (Reputation) present the variance components as defined in the TRI model with SR as source-specific reputation. MF: method factor; LD: Latent Difference variable. For the CTC(M-1) and LD MTMM model, the trait variable comprises trait and identity influences. SR: source-specific reputation. Consistency and Method-Specificity are only meaningful for  $k \neq 1$ . In the LD MTMM model, intercepts and trait loading parameters do not show the index  $k$  as the loading parameters for indicators sharing the same indices  $i$  and  $j$  are restricted to be identical.

Table A5

Admissible Correlations in the CTC( $M-1$ ) and LD MTMM models

	CTC( $M-1$ ) model	LD MTMM model
Correlation of Trait variables	Admissible (discriminant validity)	Admissible (discriminant validity)
Correlation of source-specific variables / method factors	Correlations between $MF_{jk}$ with identical index $k$ (generalizability of rater-specific method effects)	Correlations between $LD_{jk}$ with identical index $k$ (association of rater-specific deviations)
	Correlations between $MF_{jk}$ with different indices $k$ but identical index $j$ (generalizability of other ratings for a given trait)	Correlations between $LD_{jk}$ with different indices $k$ but identical index $j$ (associations of other-rating deviations for a given trait)
	Correlations between $MF_{jk}$ with different indices $k$ and different indices $j$ (association of under- and overestimation across traits and raters)	Correlations between $LD_{jk}$ with different indices $k$ and different indices $j$ (association of deviations across traits and raters)
Correlations of trait variables with source-specific variables / method factors	Correlations of $T_j$ and $MF_{jk}$ are only admissible for variables <i>not</i> sharing the same index $j$ [association of parent- or friend under- or overestimation for a given trait with another trait (dark halo)]	Correlations of $T_j$ and $LD_{jk}$ for variables <i>not</i> sharing the same index $j$ (association of parent- or friend deviation with "other" trait)
		Correlations of $T_j$ and $LD_{jk}$ for variables sharing the same index $j$ (association of parent- or friend deviation with trait; effect of the trait on the other-reports)



## A6 – TRI model

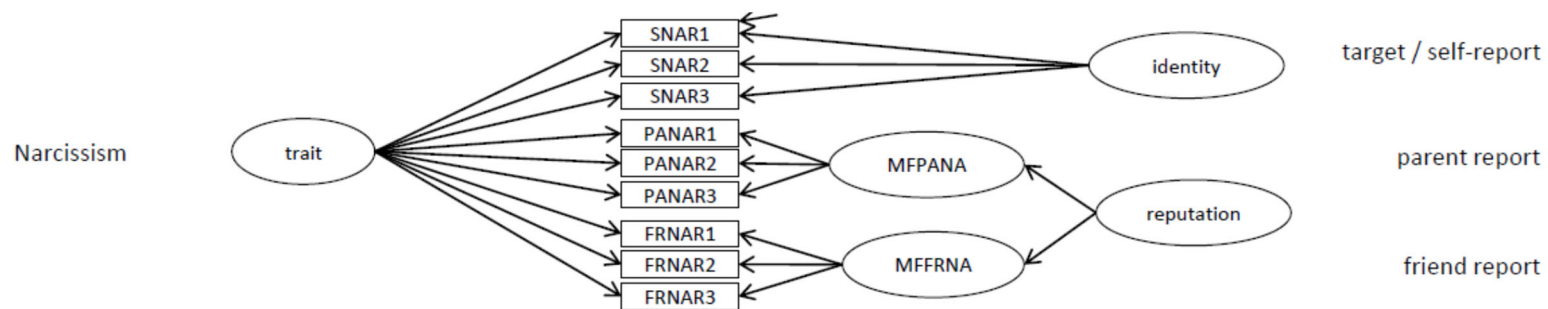


Figure A6.

The TRI model for narcissism.

Trait, reputation and identity: components of the TRI model; MFPANA: systematic residual variance of the parent report – method factor for parent ratings; MFFRNA: systematic residual variance of the friend report – method factor for friend ratings; SNAR to FRNAR: three (1-3) indicators of narcissism in self- (S), parent (PA), and friend (FR) report. For the sake of accessibility, the measurement residual is only depicted for SNAR1 but estimated for all indicators.

## A7 – LD Model

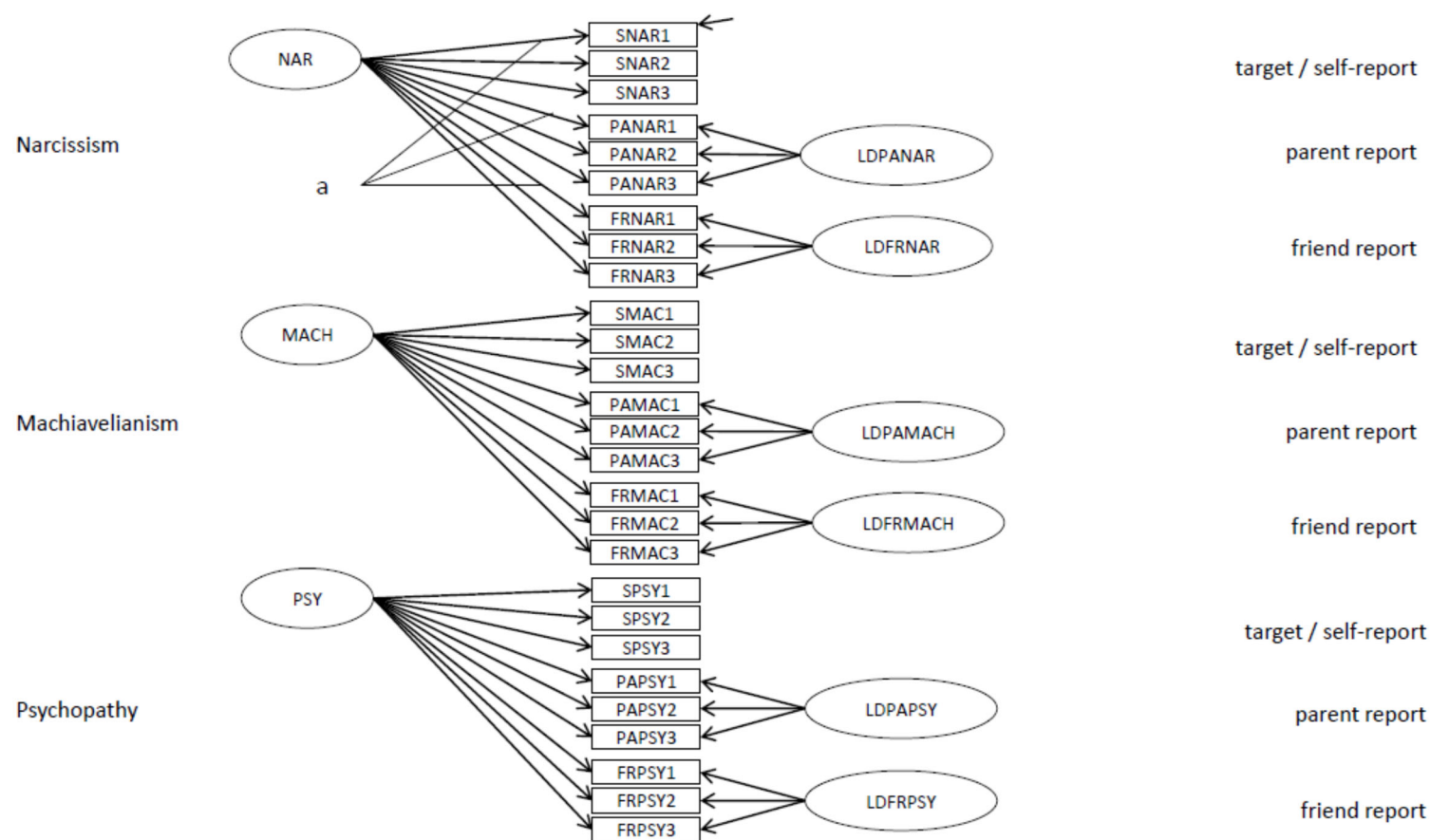


Figure A7.

LD MTMM model. NAR: Narcissism, MACH: Machiavellianism; PSY: Psychopathy; LDPANAR, LDPAMACH, LDPAPSY: method factors for parent reports; LDFRNAR, LDFRMACH, LDFRPSY: method factors for friend reports; SNAR1 to FRPSY3: indicators (3 per trait and method combination); For the sake of accessibility, the measurement residual is only depicted for SNAR1 but estimated for all indicators; all latent variables may correlate (not depicted). a: trait loadings of identical indicators (e.g., SNAR1, PANAR1, FRNAR1) are restricted to be identical.

# A8 empirical CTC(M-1) model

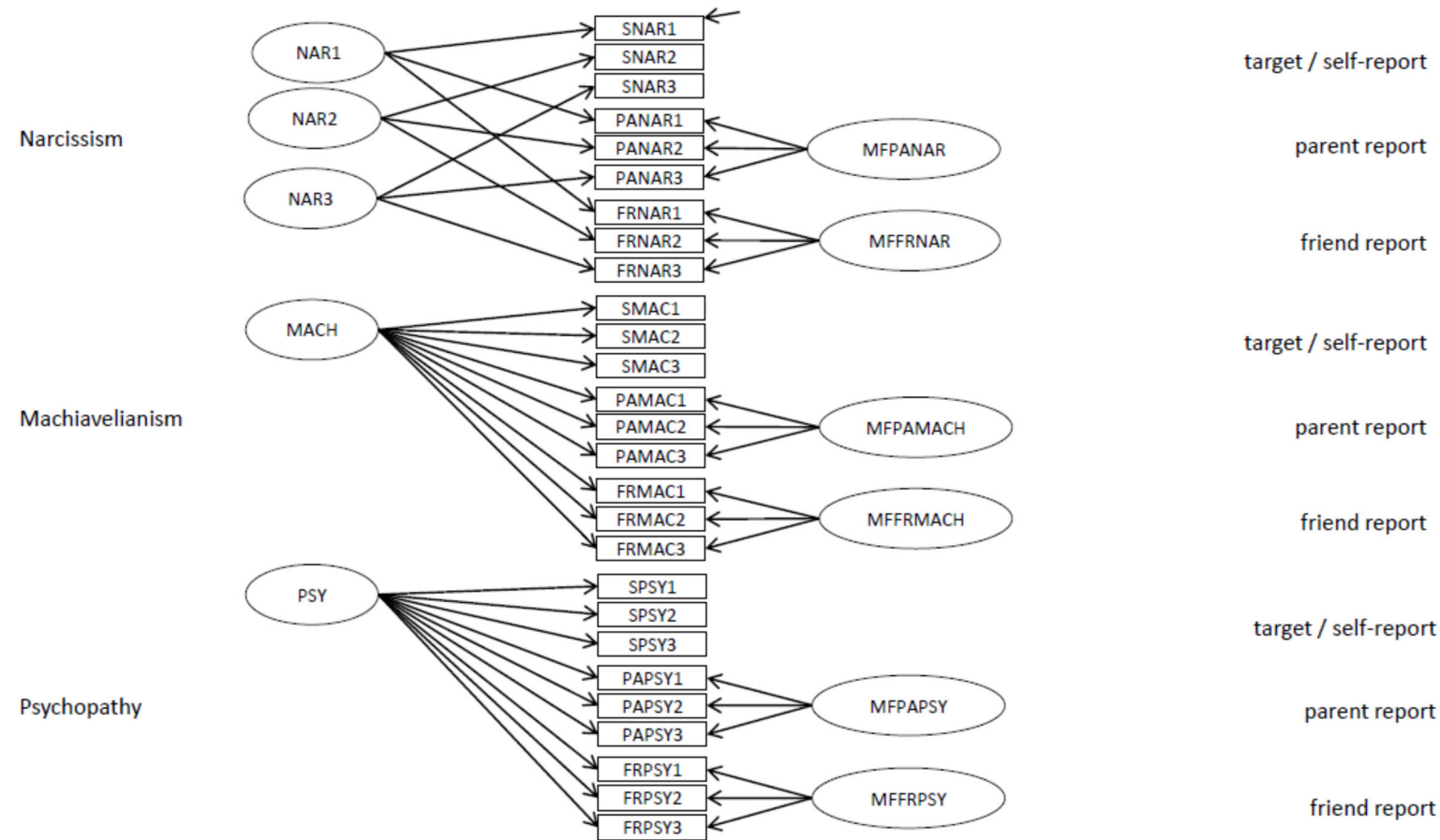


Figure A8.

CTC(M-1) model. NAR1 to NAR3: parcel-specific Narcissism factors, MACH: Machiavellianism; PSY: Psychopathy; MFPANAR, MFPAMACH, MFPAPSY: method factors for parent reports; MFFRNAR, MFFRMACH, MFFRPSY: method factors for friend reports; SNAR1 to FRPSY3: indicators (3 per trait and method combination); For the sake of accessibility, the measurement residual is only depicted for SNAR1 but estimated for all indicators; trait variables may correlate (not depicted), all method factors may correlate (not depicted), method factors may correlate with traits not belonging to the same trait-method-unit.

# A9 – empirical LD MTMM model

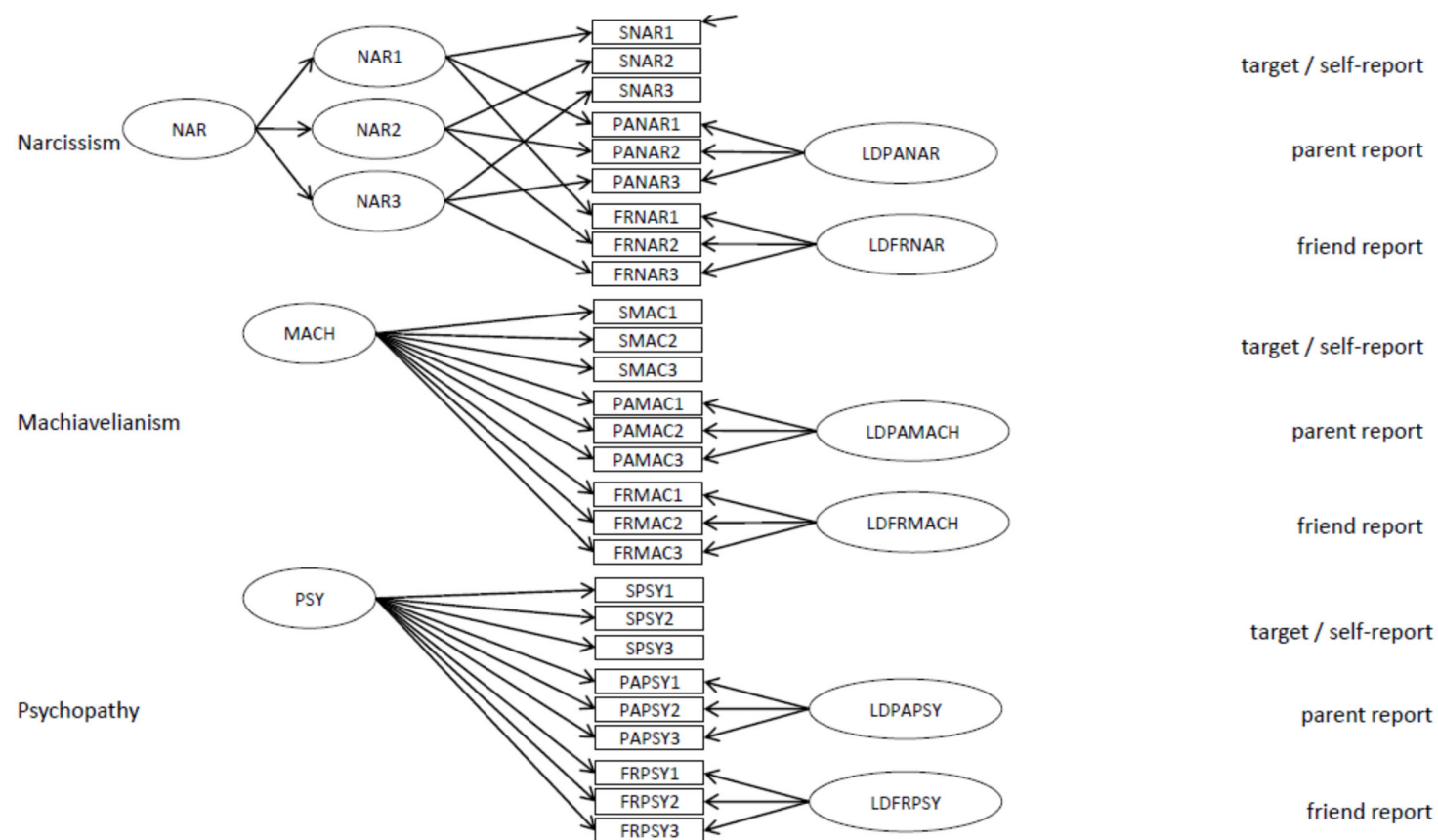


Figure A9.

Empirical LD MTMM model. NAR: Narcissism (2<sup>nd</sup> order), NAR1, NAR2, NAR3: parcel-specific Narcissism factors; MACH: Machiavellianism; PSY: Psychopathy; LDPANAR, LDPAMACH, LDPAPSY: method factors for parent reports; LDFRNAR, LDFRMACH, LDFRPSY: method factors for friend reports; SNAR1 to FRPSY3: indicators (3 per trait and method combination); For the sake of accessibility, the measurement residual is only depicted for SNAR1 but estimated for all indicators; all latent variables may correlate (not depicted). a: trait loadings of identical indicators (e.g., SNAR1, PANAR1, FRNAR1) are restricted to be identical.