Twin-Youth Report: Mother Knows Best (Almost)

Alicia Doyle, B.A.[1], James J Hudziak, M.D.[1], Bartels, Meike , Ph.D.[2], David C. Rettew, M.D.[1,] Richard, Todd, M.D.[3], Althoff, Robert, M.D.[4], Achenbach, Thomas M., M.D.[5], Boomsma, Dorret, I., Ph.D.[2]

[1]University of Vermont College of Medicine, [2]Vrije University, [3]Washington University School of Medicine, [4]Massachusetts General Hospital, [5]University of Vermont

Objective

We tested phenotypic correlations between self, mother, father and sibling (co-twin) reports on internalizing and externalizing behaviors on the Child Behavior Checklist (CBCL; Achenbach, 1991).

Introduction

- Although the use of parent, teacher, and self report is now a standard approach to the assessment of children and adolescents with behavioral problems, there has been little work done on utilizing siblings as a potential important source of diagnostic information.

-We created a version of the CBCL for members of twin pairs to report on their co-twin behavior (see Figures 1 & 2). This checklist, called the Twin Youth Report (TYR) was specifically developed to determine if monozygotic (MZ) or dizygotic (DZ) twin pairs could provide more insights into their co-twin's behavioral profile than self reports (Youth Self Report – YSR) or parent reports (CBCL).

- In this initial set of studies we collected CBCL (mother and father), TRF, YSR, and TYR data on 148 same sex twin pairs in order to test, using genetically informative approaches, the contributions of this additional informant (a co-twin, the closest of siblings) to our multi-informant approach.

- We report the genetic architecture of the TYR and on the phenotypic correlations across the TYR with self report data (YSR), teacher report data (TRF), and parent report data (mothers and fathers on the CBCL).

Sample

148 same sex twin pairs from the Washington University Twin Study (WUTS; Todd, R. P.I.). The twins ranged in age from 11-17.

MZ pairs: 71 (39 male, 32 female)
DZ pairs: 77 (53 male, 24 female)

Measures

The CBCL family if instruments measures child and adolescent emotional and behavioral problems on 8 syndromes and two broad based scales, Internalizing (INT) and Externalizing (EXT) problem behavior.

Analyses

Genetic modeling was performed using the statistical package MX (Neale, 2003). These procedures allowed for the estimation of the magnitude of influence from additive genetics (A), shared environment (C), and unshared environment (E).

Figure 1: The mother report version of the CBCL.

Figure 2: The twin report version of the CBCL.

Table 1: Phenotypic correlations in internalizing and externalizing scores by informant

	TYRt1	CBDt1	CBMt1	TRFt1	YSRt1	TYRt2	CBDt2	CBMt2	TRFt2	YSRt2
TYRt1		**0.2903**	**0.5431**	**0.1859**	**0.5651**	**0.4884**	**-0.0466**	**0.2766**	**0.0186**	**0.5550**
CBDt1	0.2297		**0.6627**	**0.1179**	**0.2836**	**0.3053**	**0.4755**	**0.3868**	**0.1189**	**0.2182**
CBMt1	0.5156	0.4766		**0.2793**	**0.4832**	**0.4615**	**0.2678**	**0.5332**	**0.1446**	**0.3703**
TRFt1	0.0449	-0.0259	0.0581		**0.3180**	**0.2344**	**-0.0272**	**0.0679**	**0.6358**	**0.1531**
YSRt1	0.5354	0.5203	0.5286	-0.0105		**0.6767**	**0.1496**	**0.3076**	**0.2543**	**0.5609**
TYRt2	0.3685	0.2858	0.4131	0.1548	0.5636		**0.4677**	**0.6466**	**0.3080**	**0.6271**
CBDt2	0.0211	0.4611	0.1041	0.2157	0.1603	0.3801		**0.6351**	**0.4092**	**0.4431**
CBMt2	0.2301	0.2477	0.4154	0.1334	0.3011	0.5162	0.5946		**0.3655**	**0.5525**
TRFt2	-0.0256	0.0705	0.0488	0.6036	-0.0380	0.1858	0.2413	0.3362		**0.2970**
YSRt2	0.5207	0.1598	0.2023	0.0340	0.3146	0.4551	0.3013	0.4589	0.0181	

***Bold** numbers report correlations for externalizing scores; non-bold numbers report correlations for internalizing report scores*

TYR = Twin Youth Report; CBD = Child Behavior Checklist, father report; CBM = Child Behavior Checklist, mother report; TRF = Teacher Report Form; YSR = Youth Self Report; t1 = Twin 1; t2 = Twin 2

Table 2: Univariate model fitting for internalizing problems according to the Twin Youth Report. Bold print indicates best fitting model.

Model	-2LL	ΔX^2	df	P	AIC	a^2	c^2 (M/F)	e^2 (M/F)	Comparison
1. ACE	1695.98	-	245	-		0.2	0.3	0.53	-
2. CE	**1696.32**	**0.34**	**246**	**0.56**	**-1.67**	**0**	**0.42**	**0.53**	**1**
3. AE	1697.32	1.3.41	246	0.25	-0.66	0.5	0	0.5	1

Results

- The correlation between a child's self report (YSR) and that given by his or her twin was similar to the correlation between self-report and the child's mother report (see Table 1).

- For externalizing problems, there was some evidence that a child's twin may observe behavior not reported by parents – particularly with MZ twins.

-Univariate model fitting revealed differences between the reporting of internalizing versus externalizing problems.

-For internalizing problems using the TYR, the best fitting was a CE model (see Table 2).

-For CBCL mother and father reports, ACE models were the best fitting.

-For externalizing problems, an ACE model was best for the TYR as well as CBCL mother and father reports.

Conclusions

-For internalizing problems, twins (MZ or DZ) are no more aware of their co-twin's symptoms than their mother.

-For externalizing problems, MZ twins may be more aware of their co-twin's behaviors than DZ twins.

-Obtaining information from co-twins may be a useful datapoint in the assessment of externalizing symptoms as twins may be better than parents at recognizing certain externalizing behaviors.

-Model fitting results of the TYR indicate internalizing symptoms are influenced by shared and unshared environmental factors, although additive genetic influences cannot be ruled out because of our relatively small sample size.

References

Achenbach, TM (1991). Manual for the Child Behavior Checklist/4-18 and 1991 Profile. Burlington, VT: University of Vermont Department of Psychiatry.

Neale, M, Boker, SM, Xie, G, Maes H (2003). Mx: Statistical Modeling (6th edition). Richmond, VA: VCU Box 900126: Department of Psychiatry.