

**ENVIRONMENTAL-RISK (E-RISK) LONGITUDINAL TWIN STUDY  
CONCEPT PAPER FORM**

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Provisional Paper Title: The association between mother- and self-reported pubertal development and adolescent victimization among girls, an integrative approach.

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**Objective of the study and its significance**

Background: The relationship between pubertal development and victimization has been examined across criminology and psychology, with many studies establishing an association between early pubertal development and victimization, especially in girls. What remains unclear are the mechanisms behind the puberty-victimization link. The mechanisms behind the puberty-victimization association may be best understood by uniting the criminological literatures on victimization and the psychological literatures on pubertal risks for psychopathology.

Another key, often neglected, aspect in the puberty-victimization literature is how puberty is measured. Distinctions between different measures of pubertal development have been discussed (see Dorn et al. 2006), yet few studies use multiple measures of pubertal development and discuss the implications of those measures. Finally, studies on the puberty-victimization relationship often fail to account for the role of the family, which could, for reasons of the familial environment or genetics, explain the association between puberty and victimization.

It would seem that there is a need for a genetically sensitive study that identifies constructs from criminology and psychology and, in a longitudinal design, tests personal constructs (personal accentuation theory), contextual constructs (contextual amplification theory), potential mediators in the form of psychopathology & personal interaction, and potential confounders in an integrative theory of how different measures of pubertal development are associated with victimization among girls. Such a study may identify risks for victimization beyond, simply, early pubertal development and be used to improve interventional strategies aimed at preventing adolescent victimization.

Aims: The first aim of this proposed study is to test the relationship between two measures of pubertal development, mother-reported pubertal status (as assessed through Tanner scales) and self-reported pubertal timing (as assessed through self-reports of age of menarche), and adolescent victimization (all type, violent, and non-violent) among girls in an integrative theoretical framework.

The second aim of this proposed study is to evaluate the influence of, broadly, familial factors and, specifically, genes and the environment in the integrative theoretical model of puberty and victimization.

Reference:

Dorn LD, Dahl RE, Woodward HR, Biro F. Defining the Boundaries of Early Adolescence: A User's Guide to Assessing Pubertal Status and Pubertal Timing in Research With Adolescents. *Appl Dev Sci*. 2006;10(1):30-56.

Statistical analyses:

This study proposes to use correlational methods and regression methods to test an integrative theoretical model of puberty and adolescent victimization. Proposed model inputs have been drawn from the literature and are described below. This study proposes step-wise regression, adjusting standard errors for twin clustering, to evaluate the theoretical mechanisms in the puberty-victimization association.

After empirically evaluating and finalizing the integrative model, this study proposes to control for genetic and environmental selection using behavioral genetic methods. The proposed behavioral genetic methods include family-adjusted models (discordant twin designs which control for familial confounding) and quantitative genetic models (which estimate the variance of a phenotype attributable to genetic and environmental factors). Through the use of a quantitative genetic model we propose to decompose the variance in our modeled associations into genetic, shared environmental, and unique environmental factors.

Variables (select references denoted by superscript):

Construct	E-Risk variable(s)	E-risk variable name(s)	Age(s)
<b>Outcome</b>			
Adolescent victimization	JVQ Items	JVQ1e18-JVQ6e18, JVQ8e18-JVQ11e18, JVQ15e18-JVQ17e18, JVQ20e18, JVQ25e18-JVQ28e18, JVQ38e18-JVQ40e18, polyvctze18, VCTZDICONE18, VCTZDIMALE18, VCTZDIPERE18, VCTZDISEXE18, VCTZDIFAME18, VCTZDIINTE18, VCTZDINEGE18	18
<b>Main exposure</b>			
Pubertal development	Mother-rated Tanner stage	PF5EM12, PF6EM12	12
	Mother-reported age at menarche	PF3AGEM12	12
	Self-reported age at menarche		18
<b>Theoretical mediators</b>			
Psychological distress/internal psychopathology <sup>1,2</sup>	Depression scale (mother-reported)	DEPRSE12	12
	Depression scale (twin-reported)	CDIE12	12

Poor social interaction <sup>2</sup>	Social problems subscale (mother-reported)	SPEM12	12
	Problems with friends (twin-reported)	STR05EC12	12
	Social isolation	SISOCE5	5
		SISOCE12	12
<b>Theoretical moderators</b>			
<i>Contextual</i>			
School sex composition <sup>3</sup>	What type of school does twin attend? (teacher-reported)	SCHGENE12	12
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Delinquent peers <sup>4,5</sup>	If you wanted to [be delinquent] could you do them with your twin? (twin-report)	CON25EC12	12
	Do you have a friend (not your twin) who you could [be delinquent] with? (twin-report)	CON26EC12	12
	Have an older sibling, or even a cousin who you could [be delinquent] with? (twin-report)	CON27EC12	12
Parental monitoring <sup>6</sup>	Mother-reported parental monitoring	CONTEM12	12
	Twin-reported parental monitoring	CONTEC12	12
<i>Personal</i> <sup>7</sup>			
Pre-pubertal conduct disorder	Conduct disorder symptoms	CDTOTCRIT_EMT5, CDTOTCRIT_EMT7, CDTOTCRIT_EMT10	5, 7, 10
Pre-pubertal low self-control	Low self-control	LOWSC510E	5-10
Pre-pubertal depression	Depression scale	DEPRSE5, DEPRSE7, DEPRSE10	5, 7, 10
Polygenic score for social wellbeing			
Polygenic score for education			
<b>Theoretical confounders</b>			
Childhood victimization <sup>8</sup>	Physical abuse	PABSEVTYE12	12
	Sexual abuse	SASEVTYE12	12
	Bullying	BULLSEVE12	12
Childhood father absence <sup>9,10</sup>	Proportion of time spent without biological parent up to age 10 years	BIOPARPROPL10	birth-10
<b>Covariates</b>			
Sex (study of females only)		SAMPSEX	
Childhood SES	SES Disadvantage	SESDISM5	5
Maternal depression	From 5-12	TOTDEPM512	5-12
		RECDEPM512	5-12
	Past year	MDEPM5, MDEPM7,	5, 7, 9,

Obesity	Research worker rated obesity	MDEPM10, MDEPM12	12
IQ	Full scale IQ	PAE2C12	12
		FSIQ12e	12
Adolescent delinquency <sup>11,12</sup>	Conduct disorder computer questionnaire	CD1E18 – CD39E18, CD43E18, CD44E18	18
Adolescent delinquent peers <sup>4,5</sup>	Conduct disorder computer questionnaire	CD40E18-CD42E18	18
Romantic attachments <sup>13</sup>	Life history chart – Living with #14 girlfriend/boyfriend/spouse		18
Polygenic score for menarche			

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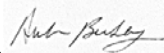
### Data Security Agreement

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Proposing Author	Amber L. Beckley
Today's Date	10/31/2017

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- I will not post data online or submit the data file to a journal for them to post. Some journals are now requesting the data file as part of the manuscript submission process. The E-Risk Study cannot be shared because the Study Members have not given informed consent for unrestricted open access. Speak to Terrie or Avshalom for strategies for dealing with data sharing requests from Journals.
  
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- I will ensure geographical location information, including postcodes or geographical coordinates for the E-Risk study member's homes or schools, is never combined or stored with any other E-Risk data (family or twin-level data)

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