LONGITUDINAL PREDICTORS OF PARENTAL INVOLVEMENT AND TYPE 1 DIABETES MANAGEMENT ACROSS ADOLESCENCE

DEBORAH J. WIEBE[1], PHD, CHONG CHOW[2], PHD

JONATHAN BUTNER[3], PHD, DEBRA PALMER[4], PHD,

NATHAN STORY[3], MA, PETER OSBORN[3], MA, &

CYNTHIA BERG[3], PHD

[1]UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL CENTER

[2]UNIVERSITY OF WISCONSIN, OSHKOSH

[3]UNIVERSITY OF UTAH

[4]UNIVERSITY OF WISCONSIN, STEVENS POINT

Adolescent Diabetes Management

- Diabetes management deteriorates during adolescence
- May reflect transfer of responsibility for diabetes management from parent to child
  - Parental responsibility declines with age
  - Lower responsibility is associated poorer diabetes management, particularly if premature
- How do parents and adolescents make decisions of when to transfer responsibility for diabetes care?

Anderson et al. (1997; 2000); Wiebe et al. (2005); Wysocki et al. (1996)

Developmental Factors Associated with Declines in Parental Responsibility

- Age

- Efficacy for diabetes management
  - Transfer of responsibility that reflects growth in efficacy may be most effective for maintaining adherence

- Pubertal status
  - Transfer of responsibility that reflects pubertal maturation may be problematic for diabetes management

Palmer et al. (2004; 2009)

Need for longitudinal research

- Few longitudinal studies of transfer of diabetes responsibility from parent to child

- Cross-sectional studies do not tell us:
  - How responsibility changes across time
    - Linear vs nonlinear change
  - What predicts changes in parental responsibility across time
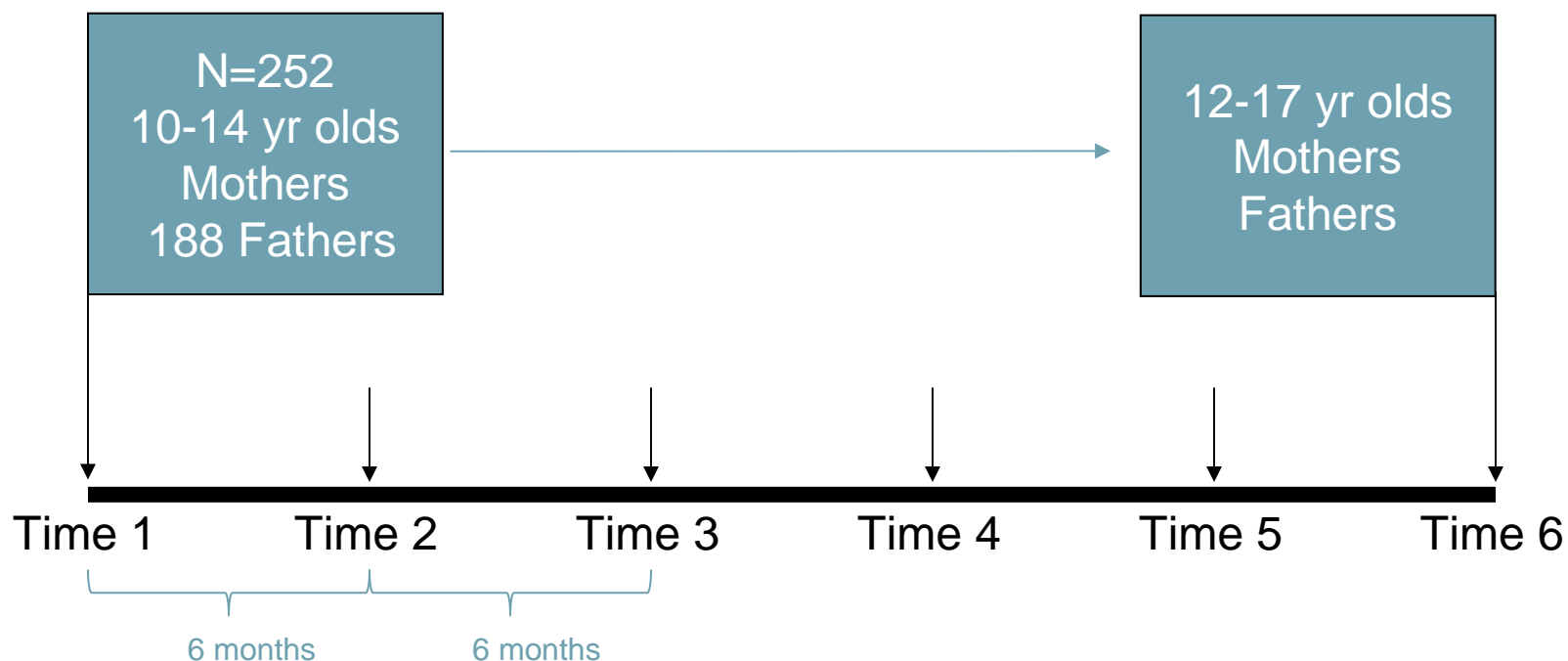
Objectives of Study

- To examine <u>longitudinal</u> declines in parental responsibility across adolescence
  - To determine whether decline is linear or nonlinear

- To identify the developmental predictors of longitudinal declines in responsibility
  - Adolescent age, efficacy for diabetes management, and pubertal status

- To explore which predictors are better markers for maintaining adherence across adolescence

ADAPT
Adolescents with Diabetes and Parents Together
NIH RO1 DK063044

N=252
10-14 yr olds
Mothers
188 Fathers

12-17 yr olds
Mothers
Fathers

Time 1   Time 2   Time 3   Time 4   Time 5   Time 6

6 months   6 months

TIME 1:   54.4% Female
M (sd) Age = 12.5 (1.5) yrs old   51.2% on insulin pump
M (sd) time since dx = 4.7 (3.0) years   92.8% Caucasian

Measures

- ## Parental Responsibility for Diabetes (Rubin et al., 1989)
  - *Who is responsible for deciding insulin dose?*
  - *Who is responsible for checking blood glucose levels? Etc...*
  - *(1 = child alone, 3 = parent/child share equally, 5 = parent alone)*

- ## Pubertal Status (Petersen et al., 1988)
  - Self-reports of extent of pubertal maturation
  - *(1 = has not yet started, 4 = seems completed)*

- ## Self-Efficacy for Diabetes (Iannotti et al. 2006)
  - *How sure are you that you/your child can adjust insulin correctly?*
  - (1 = not at all sure, 10 = completely sure)

- ## Self Care Inventory (La Greca et al.)

Analyses for Objective 1

- To examine <u>longitudinal</u> declines in parental responsibility across adolescence, and determine whether declines are linear or nonlinear

- Latent univariate growth models of longitudinal declines in parental responsibility for each reporter
  - Time points 1-6 was the marker of time
 - Linear and nonlinear models were tested and compared

Linear Growth Model for Parental Diabetes Responsibility across Reporters

|	Teen Report	Mother Report	Father Report
Mean (SE)			
Initial Status	2.591 (.039)**	2.886 (.036)**	2.938 (.045)**
Linear Change	-.091 (.007)**	-.109 (.005)**	-.103 (.008)**
Fit Statistics			
Chi Sq/df	25.918/21	103.997/21	47.650/21
RMSEA	.030	.125	.079
CFI	.995	.936	.967
TLI	.997	.954	.976

**p < .01

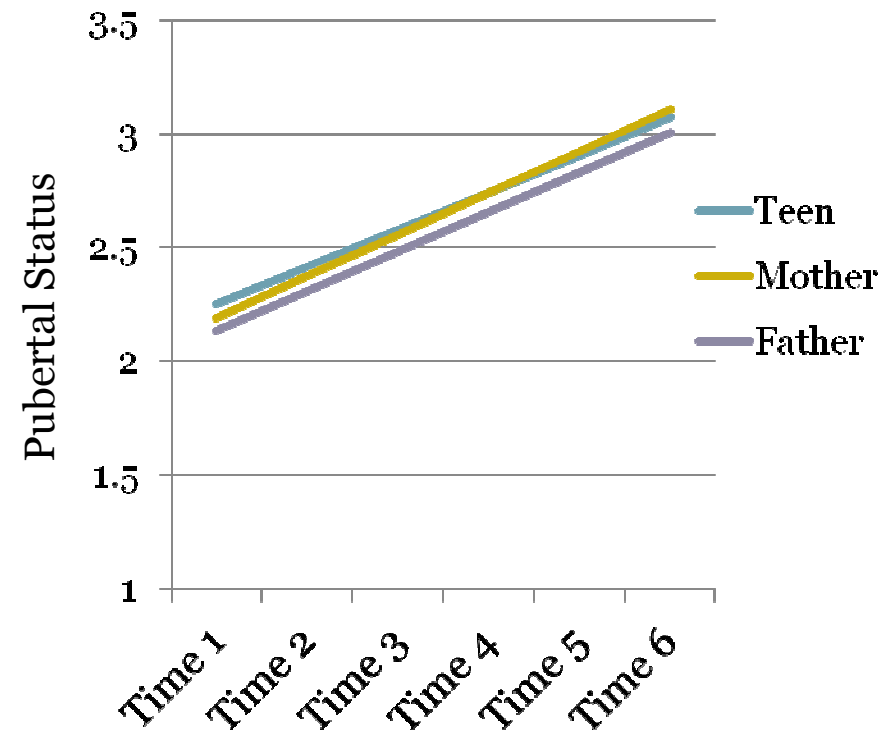# Linear Declines in Parental Responsibility across Time
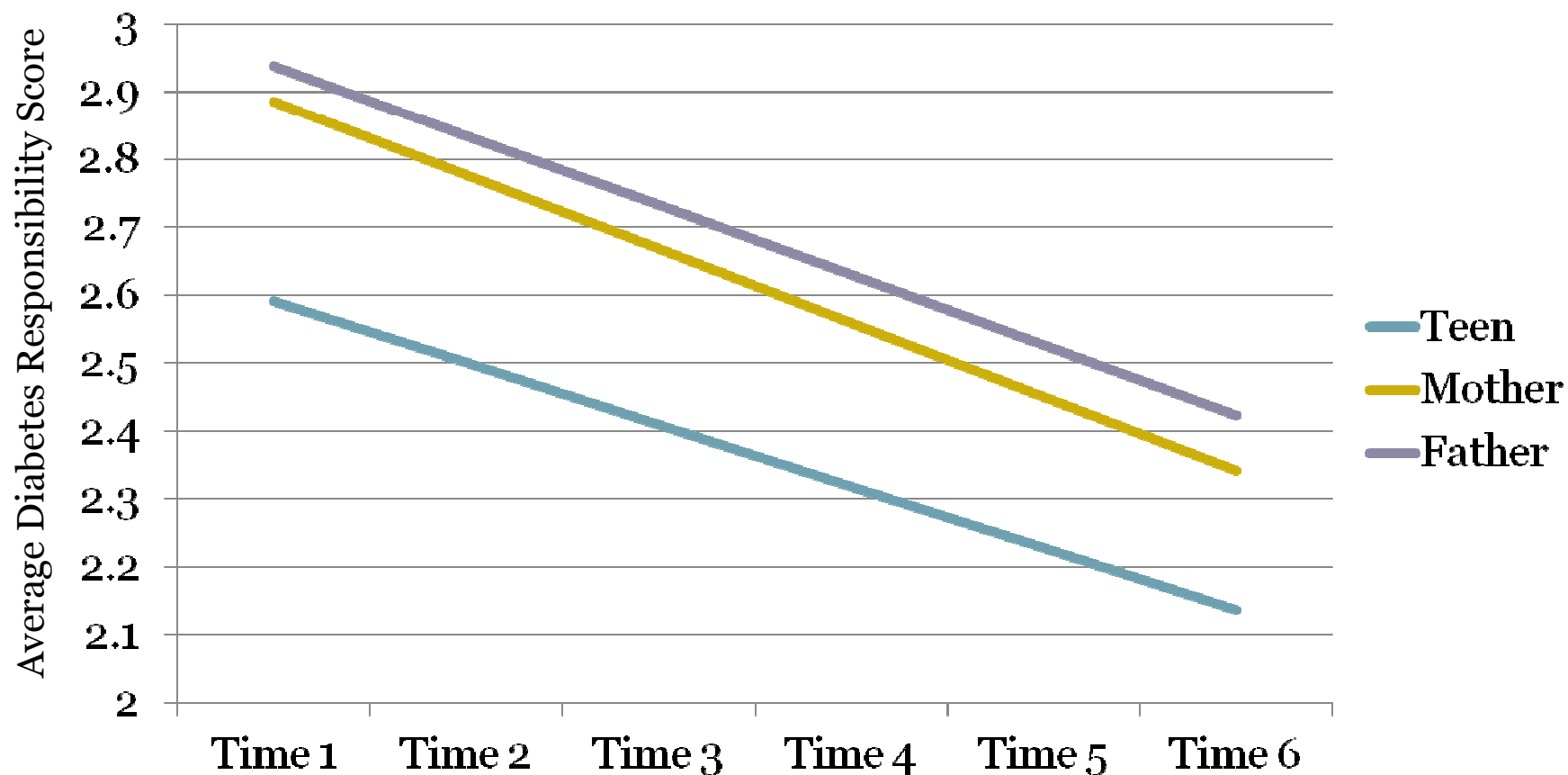
DRS: 1 = Child alone; 2 = Mostly child; 3 = Shared; 4 = Mostly parent; 5 = Parent alone

Longitudinal Growth in Developmental Predictors

Linear increase in efficacy across reporter
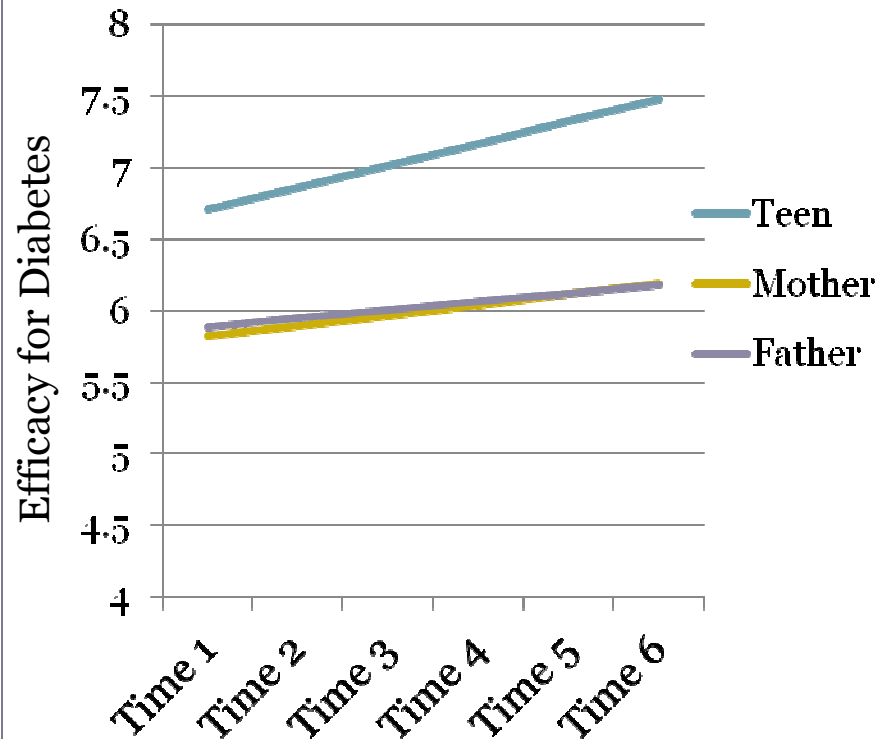
Linear increase in pubertal status across reporter

Analyses for Objective 2

- To identify longitudinal predictors of declines in parental responsibility

- Parallel process growth models were tested where change in parental responsibility across time was predicted from:
  - Covariates (Age at Time 1; Sex; Time since diagnosis)
  - Initial values of parental responsibility
  - Initial values of efficacy and <u>change</u> in efficacy
  - Initial values of pubertal status and <u>change</u> in pubertal status

Developmental Predictors of Transfer of Responsibility (Teen Report)

	Change in Responsibility
Teen Sex	.008 (.015)
Age at Time 1	.003 (.007)
Time since diagnosis	-.001 (.002)
Efficacy – Initial	-.014 (.007)*
Linear Change	-.079 (.042)^{m}
Pubertal Status - Initial	-.049 (.015)**
Linear Change	-.300 (.074)**
Fit Statistics	
Chi sq/df	361.060/197
RMSEA	.057
CFI	.953
TLI	.951
	**$p < .005$; *$p < .05$

Developmental Predictors of Transfer of Responsibility (Teen Report)

	Change in Responsibility
Teen Sex	.008 (.015)
Age at Time 1	.003 (.007)
Time since diagnosis	-.001 (.002)
Efficacy – Initial	-.014 (.007)*
Linear Change	-.079 (.042)^m
Pubertal Status - Initial	-.049 (.015)**
Linear Change	-.300 (.074)**
Fit Statistics	
Chi sq/df	361.060/197
RMSEA	.057
CFI	.953
TLI	.951

**$p < .005$; *$p < .05$

Developmental Predictors of Transfer of Responsibility (Teen Report)

	Change in Responsibility
Teen Sex	.008 (.015)
Age at Time 1	.003 (.007)
Time since diagnosis	-.001 (.002)
Efficacy – Initial	-.014 (.007)*
Linear Change	-.079 (.042)^m
Pubertal Status - Initial	-.049 (.015)**
Linear Change	-.300 (.074)**
Fit Statistics	
Chi sq/df	361.060/197
RMSEA	.057
CFI	.953
TLI	.951

**$p < .005$; *$p < .05$

Developmental Predictors of Transfer of Responsibility (Mother Report)

|	Change in Responsibility
Teen Sex	-.015 (.018)
Age at Time 1	.001 (.008)
Time since diagnosis	-.001 (.003)
Efficacy – Initial	.006 (.006)
Linear Change	-.198 (.098)*
Pubertal Status - Initial	.009 (.017)
Linear Change	-.218 (.105)*
Fit Statistics	
Chi sq/df	429.069 / 197
RMSEA	.068
CFI	.945
TLI	.942

Analyses for Objective 3

- Are some developmental predictors better "markers" of readiness to transfer responsibility?

- Are declines in parental responsibility associated with declines in adherence across time?

- Is that association weaker if declines in responsibility are matched by growth in efficacy?
  - Moderation analysis - interaction between ΔResponsibility and ΔEfficacy

Δ Involvement X Δ Efficacy predicting Adherence

	Δ Adherence (Teen)	Δ Adherence (Mother)	Δ Adherence (Father)
Initial Adherence	-.108 (.047)*	-.020 (.043)	-.045 (.046)
Initial Efficacy	.033 (.016)*	.008 (.014)	.021 (.013)
Initial Responsibility	.034 (.020)	.022 (.028)	.010 (.029)
Δ Efficacy	.092 (.065)	.178 (.258)	-.308 (.311)
Δ Responsibility	.266 (.138)^m	.558 (.691)	-.051 (.338)
ΔEfficacy X ΔResponsibility	-1.56 (.457)**	-2.01 (1.19)^m	-7.66 (3.74)*
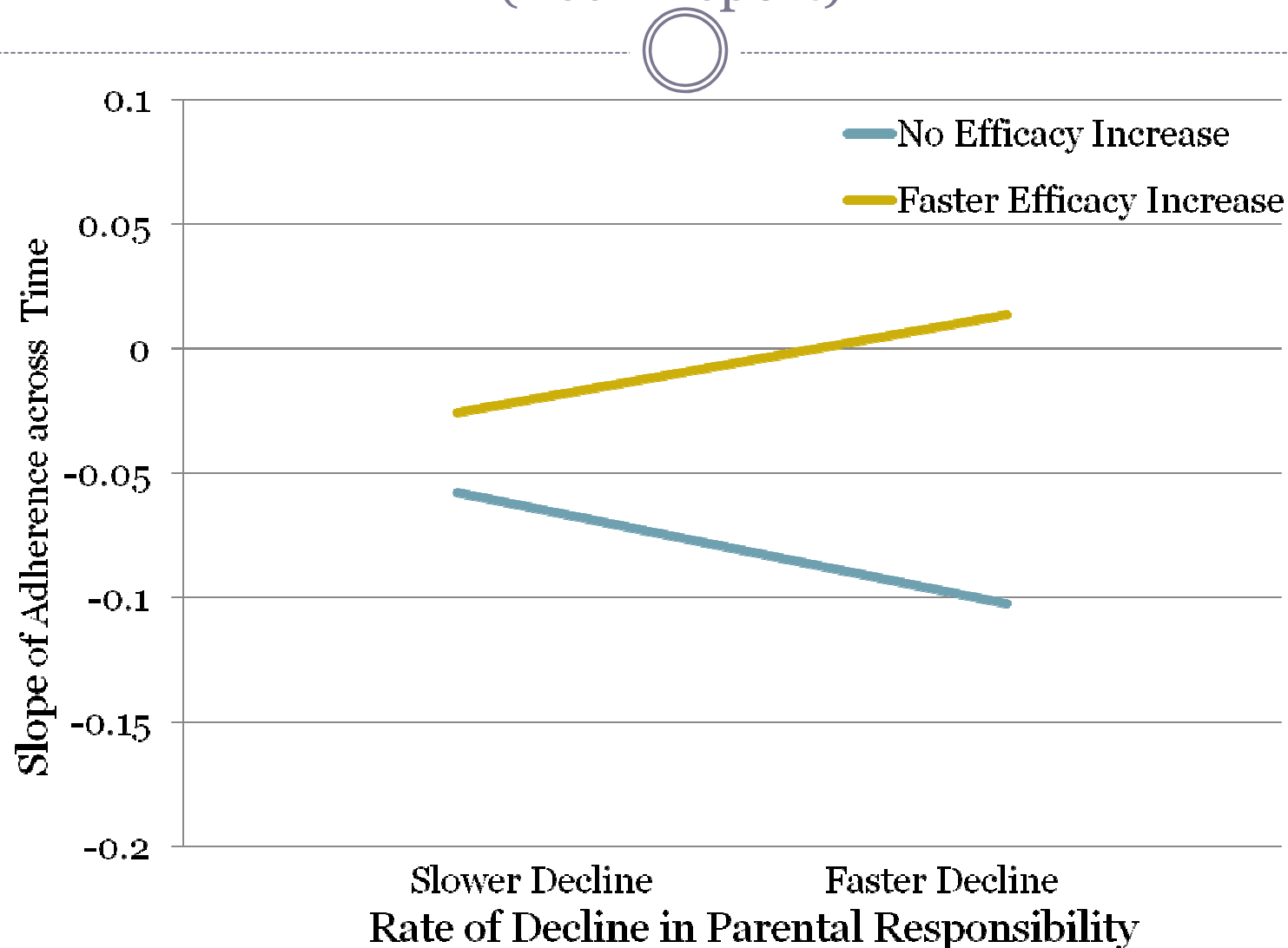
Puberty , Responsibility, and Adherence

- Increases in pubertal maturation predicted decreases in adherence
  - Mother report = -.521 (.234)*
  - Father report = -.980 (.408)*

- Pubertal maturation did not moderate links between declines in parental involvement and poorer adolescent adherence

Conclusions

- Parental responsibility gradually declines in linear fashion across adolescence

- Transfer of responsibility from parent to child reflects change in multiple developmental processes

- Transfer of responsibility that reflects growth in efficacy for diabetes management may be particularly helpful

Acknowledgements

- <u>COLLABORATORS</u>
- Cynthia Berg, Ph.D.
- Jonathan Butner, Ph.D.
- David Donaldson, MD
- Rob Lindsey, MD
- Mary Murray, MD
- Michael Swinyard, MD
- Debra Palmer, Ph.D.

- <u>POST-DOCS & STUDENTS</u>
- Jorie Butler, Ph.D.
- Pamela King, Ph.D.
- Many graduate and undergraduate assistants
- Families and Staff at Utah Diabetes Center