

# Temperament and the Relation Between Sleep Disruption and Toddler Negative Emotion



Angela Dawn Staples\*, Amanda Hyde\*, John E. Bates\*, Claire Novosad\*\*

Indiana University, Bloomington\*, Southern Connecticut State University\*\*

## INTRODUCTION

- Poor sleep can interfere with the neural processes central in developing self-regulation (Dahl 1996).
- Deficits in sleep may be related to the impulsivity and mood swings that characterize bad behavior in young children.
- Poor quality of sleep has been related to bad behavior both at school (Bates, 2002) and at home (Minde, 1994).
- Recently, Bates et al. (2003) reported that sleep was particularly important for temperamentally challenging children.
- Children who show an unadaptable/anxiety prone temperament may be more sensitive to sleep deprivation.
- The present study considers the role of temperamental unadaptability as a moderator of the relation between sleep and negative affect in toddlers.

## METHODS

### Participants:

- 34 2.5 year old children
- 18 boys, 16 girls

### Measurements:

- **Sleep Disruption:** Composite of variability of bedtime (**diary**), total sleep (**actigraph**), and lateness of bedtime (**diary**)
  - **Actigraph:** worn for four to six nights
  - **Diary:** Mother reported sleep information
- **Child Behavior Checklist:** Aggression scale was subdivided into Negative Affect and Aggressive Behavior
- **Infant Characteristics Questionnaire:** Mother reported Unadaptability (distress to novel people and situations)

## RESULTS

- The original CBCL Aggression scale [adj.  $R^2 = .25$ ;  $F(3, 34) = 4.77$ ,  $p < .01$ ] and the Negative Affect subscale [adj.  $R^2 = .36$ ;  $F(3, 34) = 7.38$ ,  $p < .01$ ] were significantly predicted in multiple regression by Unadaptability, sleep, and the Unadaptability-sleep interaction terms.
- The Aggressive Behavior subscale was not significantly predicted [adj.  $R^2 = .06$ ;  $F(3, 34) = 1.72$ ,  $p > .05$ ].
- For high Unadaptable children (+1.5 SD) high levels of sleep disruption were associated with high Negative Affect.
- For low Unadaptable children (-1.5 SD) high levels of sleep disruption were associated with low levels of Negative Affect.

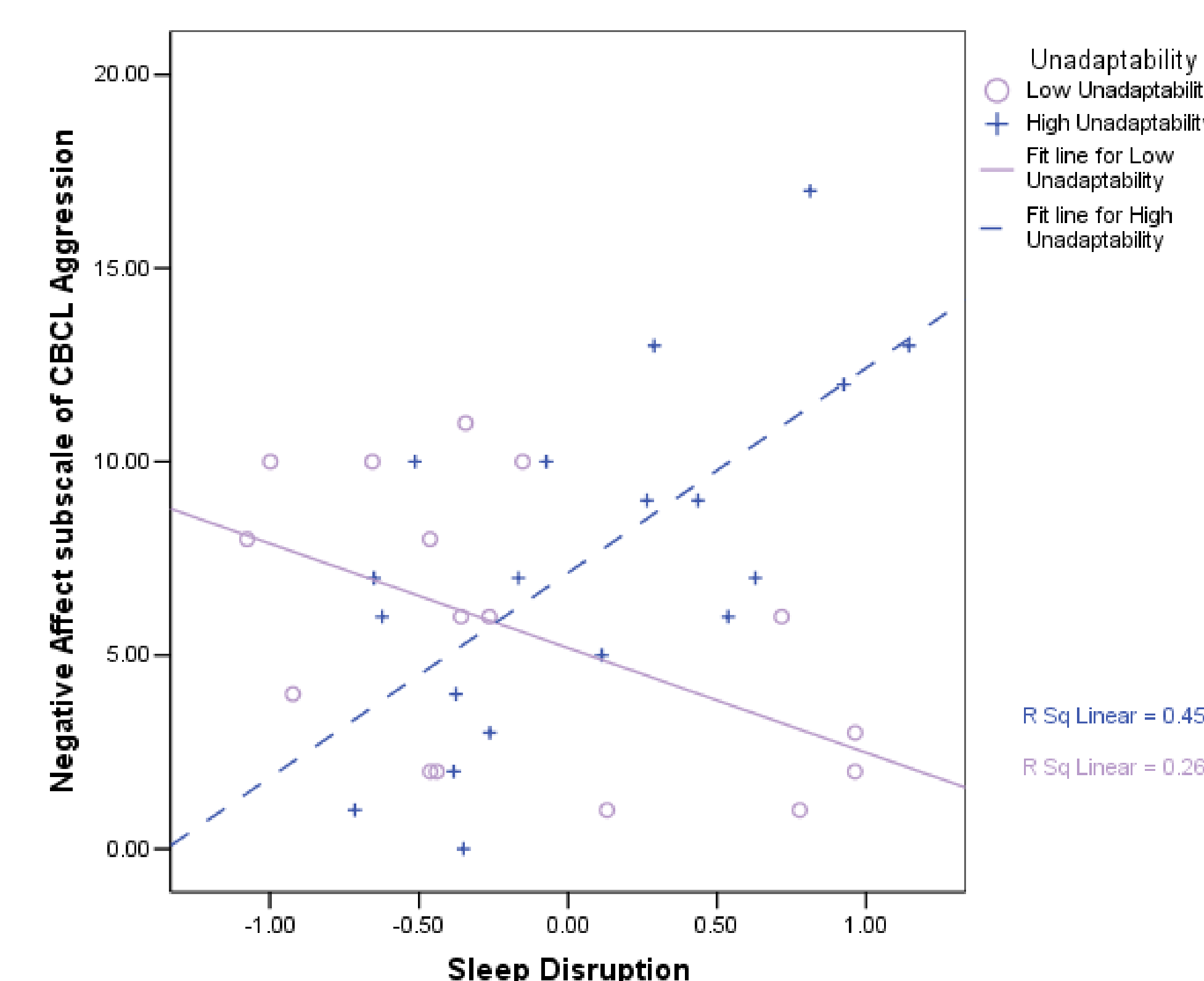
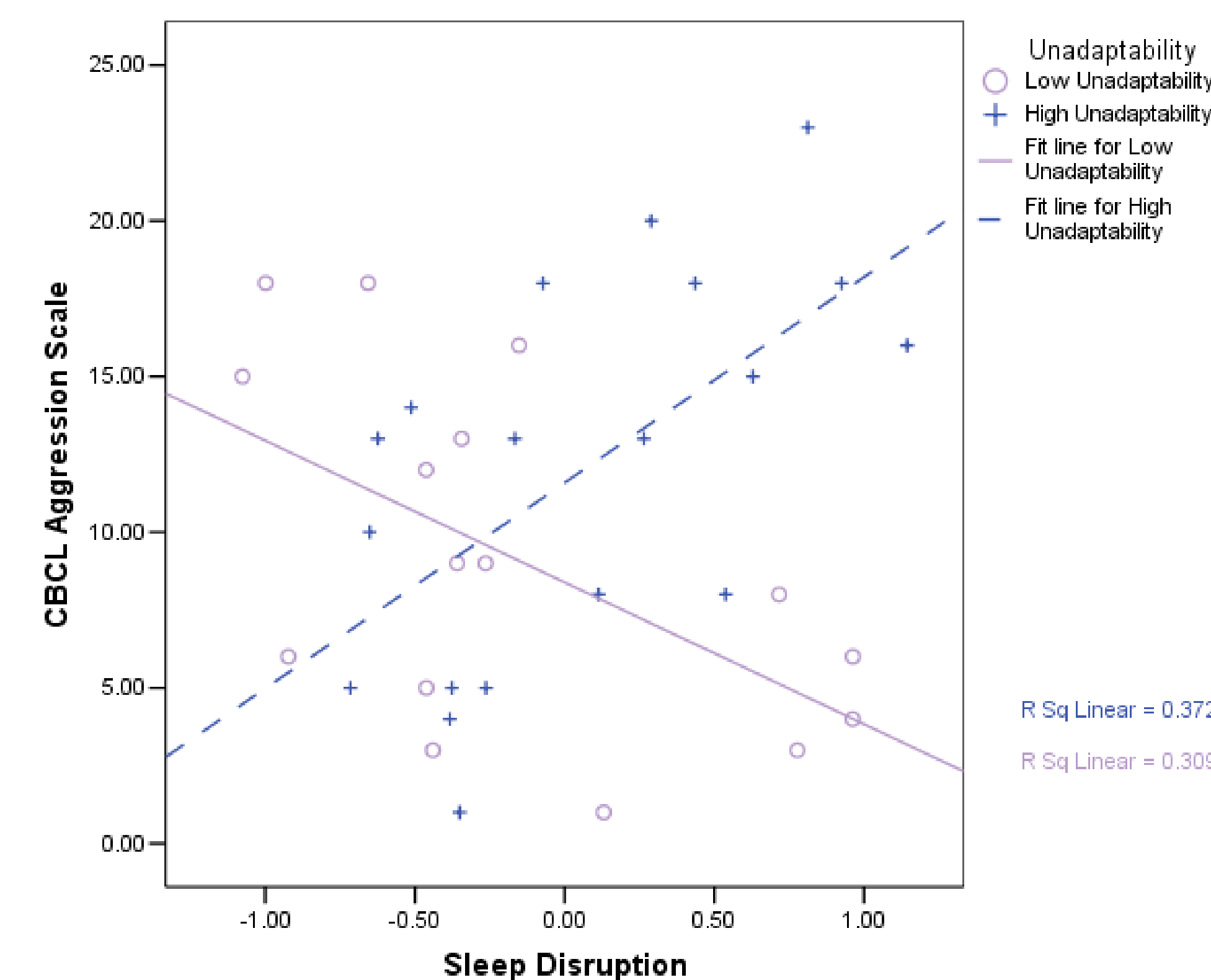
Variable	N	M	SD	Range
Bedtime	34	21:17	1:00	19:33 – 24:38
Amount of Sleep (h:mm)	34	9:29	0:44	7:50 – 10:34
Variability in amount of sleep (h:mm)	34	0:40	0:21	0:10 – 2:04
Variability of Bedtime (h:mm)	34	0:34	0:21	0:00 – 1:30
ICQ – Unadaptable	34	14.62	4.31	7 – 26
CBCL – Aggression	34	10.39	6.06	1 – 23
Negative Affect	34	6.39	1.93	0 – 17
Aggressive Behavior	34	1.67	4.15	0 – 7

Variable	1	2	3	4
1. Bed time	--	-.01	-.18	.42**
2. Bed time - variability		--	.55**	.80**
3. Amount of sleep - variability			--	.72**
4. Sleep disruption				--

Note.  $p < .05$  \*,  $p < .01$  \*\*

Variable	Model					
	B	SE B	$\beta$	adj $R^2$	F	p
<b>CBCL Aggression Scale</b>						
Unadaptable	-0.63	1.03	-0.11	0.25	4.77*	0.01
Sleep Disruption	0.17	1.53	0.02			0.91
Unadaptable x Sleep Disruption	3.07	0.86	0.59*			0.00
<b>Negative Affect Subscale</b>						
Unadaptable	-1.01	0.65	-0.03	0.36	7.38*	0.00
Sleep Disruption	0.79	0.97	0.12			0.42
Unadaptable x Sleep Disruption	2.26	0.54	0.63*			0.00
<b>Behavioral Aggression Subscale</b>						
Unadaptable	-0.76	0.36	-0.42*	0.06	1.72	0.19
Sleep Disruption	-0.77	0.54	-0.26			0.16
Unadaptable x Sleep Disruption	0.34	0.30	.211			0.26

Note.  $df(3, 34)$ ,  $p < .05$  \*



## DISCUSSION

### Summary of Results:

- Adequate sleep is especially important to reduce negative emotionality in toddlers who are more unadaptable, which is conceptually linked to fearfulness (Kagan 1998).
- Adequate sleep may allow children high in unadaptability to better regulate their anxiety in face of novel situations, which would reduce the amount of expressed negative affect.
- Low-fear children who get adequate sleep exhibit more negative emotionality than those who are sleep deprived.
  - This could occur because fearless toddlers may seek excitement or novelty in ways that are dangerous (e.g., jumping off furniture, running in a store), which likely would evoke more parental restrictions thus frustrating the child.

### Limitations and Future Directions:

- The generalizability of these results is limited due to the small predominately middle class, European American sample.
- The unexpected finding that low unadaptable children with high sleep quality expressed high negative affect may be due to a third variable such as the influence of older siblings or peers.

## FOR FURTHER INFORMATION

Please contact [ahyde@indiana.edu](mailto:ahyde@indiana.edu).

More information on this and related projects are available at [www.indiana.edu/~batesddl/](http://www.indiana.edu/~batesddl/)