

Correlates of Socioemotional and Neurocognitive Outcomes: Racial Disparities

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Outline

- Background
 - SE development: a framework for life outcomes
 - Lifecourse Model
 - Allostatic Load
- SE outcomes at one year by race
 - Bivariate relationships
 - Multivariable models
- Cognitive outcomes at two years by race
 - Multivariable models
- Hair cortisol in subsample at one year by race

Background

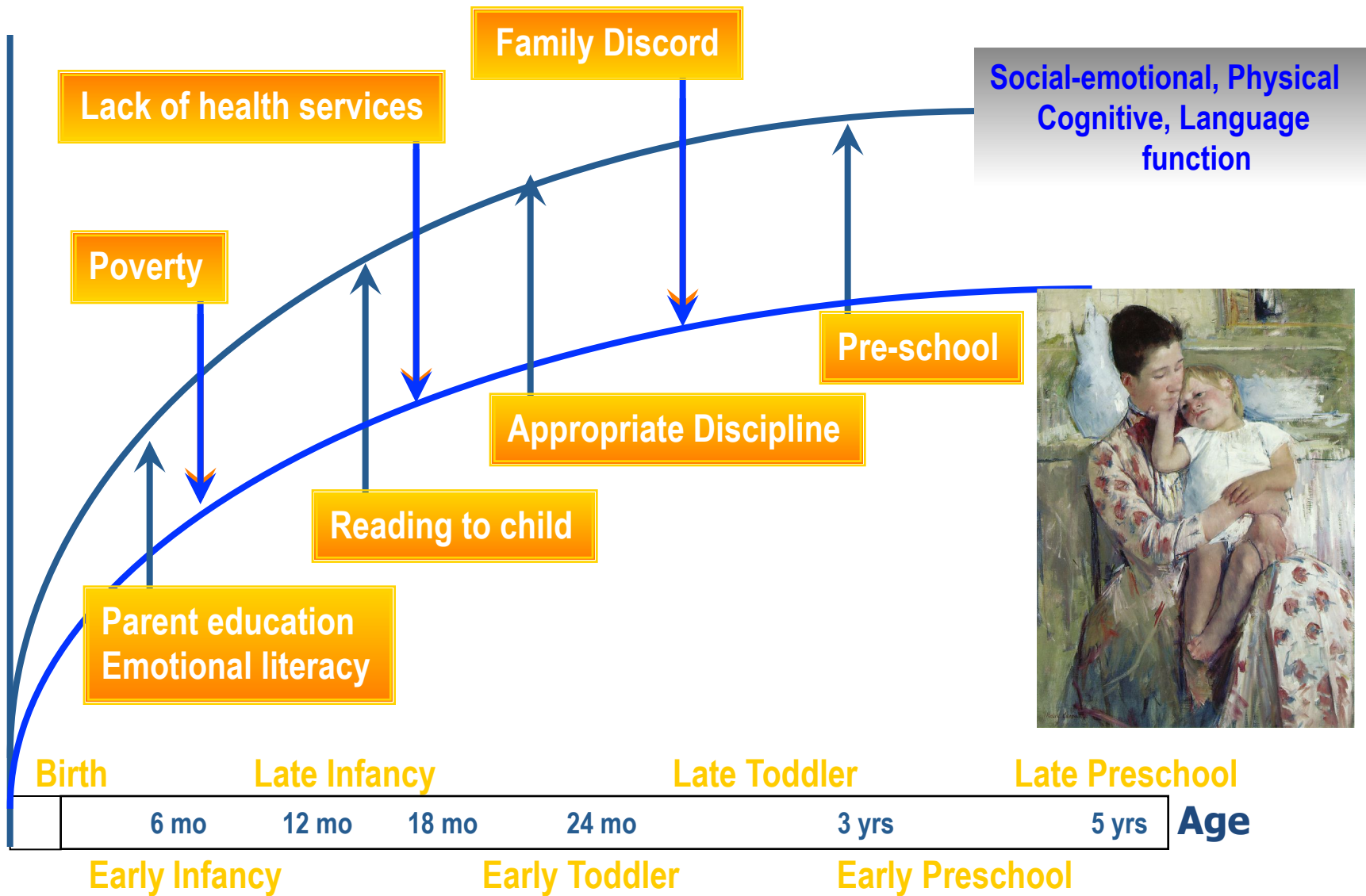
- Socioemotional development in infancy builds a framework for future social, cognitive, behavioral and emotional outcomes.
- SE competence is shown to be needed for:
 - Cognitive development & school readiness Yeung, 2009
 - Successful school performance Briggs-Gowan, 2008
 - Employment success and family income Goodman, 2011
 - Marriage/partner stability

Background

- SE development is influenced by
 - Socioeconomic variables such as income, wealth, parent education and occupation, home and neighborhood characteristics. Adler, 2010; To, 2004; Duncan, 1994; Hertzman, 2010
 - Maternal mental health Feldman, 2009
 - Parenting Ermisch, 2008
 - Stress on parents and/or infant Sturge-Apple, 2011

Lifecourse Model of Health and Development

- Today's experiences and exposures determine tomorrow's health
- Health and developmental trajectories are particularly affected during critical or sensitive periods
- The broader environment – biologic, physical, and social – strongly affects the capacity to be healthy
- Inequality in health reflects more than genetics and personal choice.



Mechanisms Influencing Lifecourse Model of Health and Development

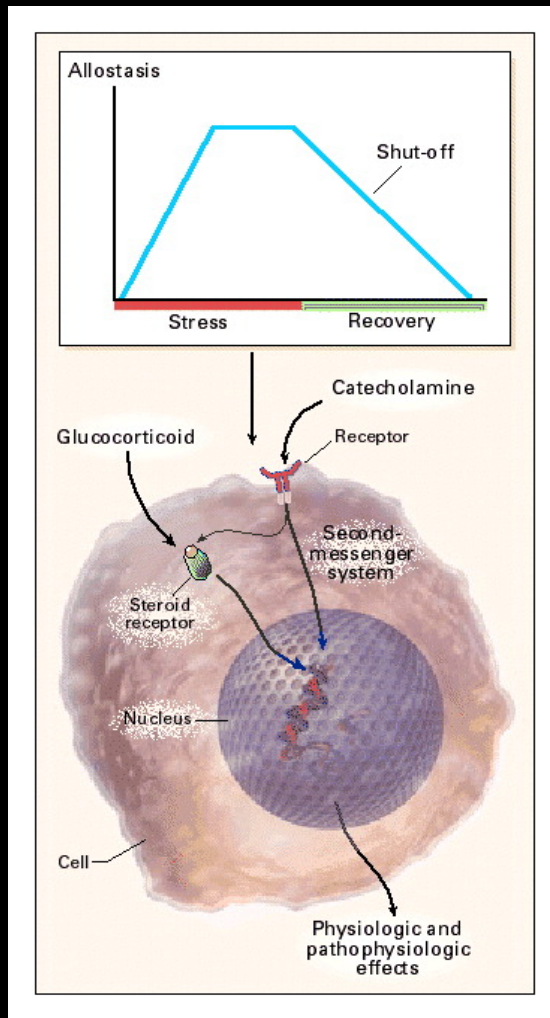
1. **Programming:** time-specific influence of stimulus or insult during a **sensitive period** on selection, adaptation, compensatory processes
2. **Predictable Pathways:** chains of (eco-culturally constructed) linked exposures that create a constrained conduit of **gene-environment transactions**

Mechanisms Influencing Lifecourse Model of Health and Development

3. **Effects are cumulative:** additive effect of multiple risks and protective factors: **“Weathering”**



Allostasis in the Autonomic Nervous System and the HPA Axis.

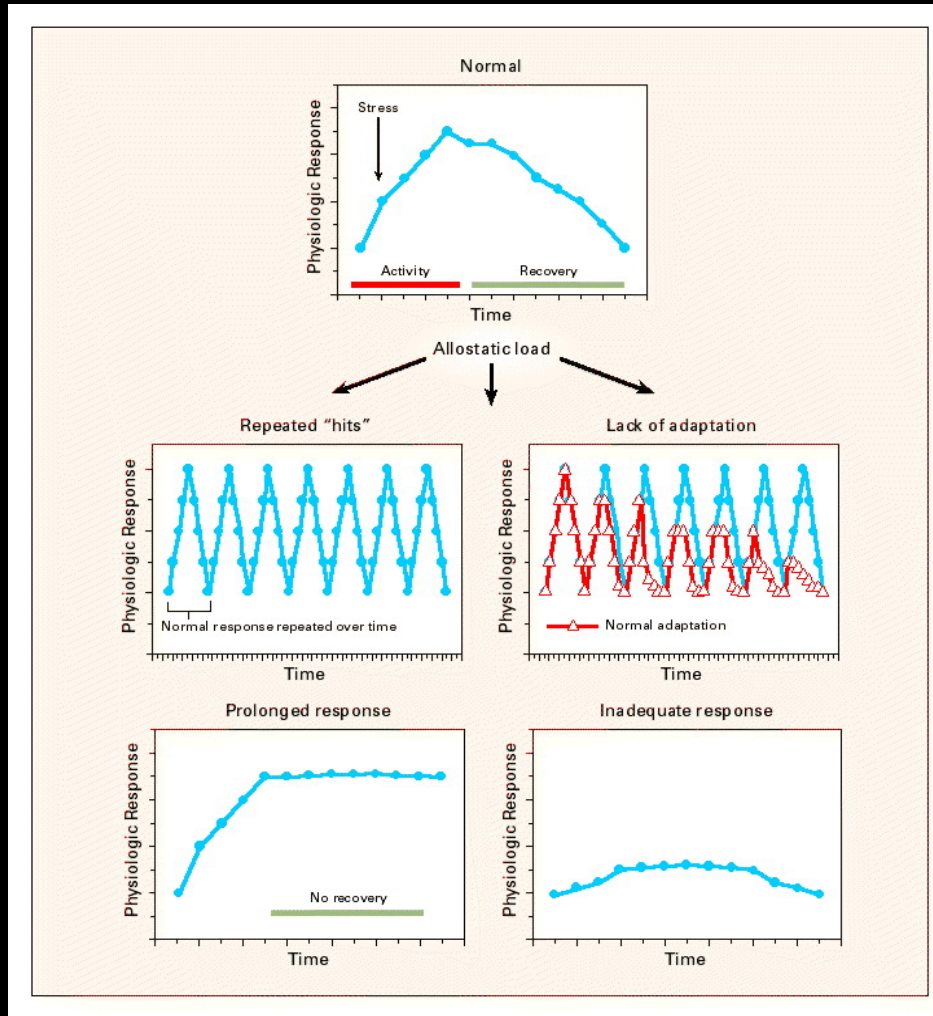


McEwen BS. N Engl J Med 1998;338:171-179.



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Three Types of Allostatic Load.



McEwen BS. N Engl J Med 1998;338:171-179.



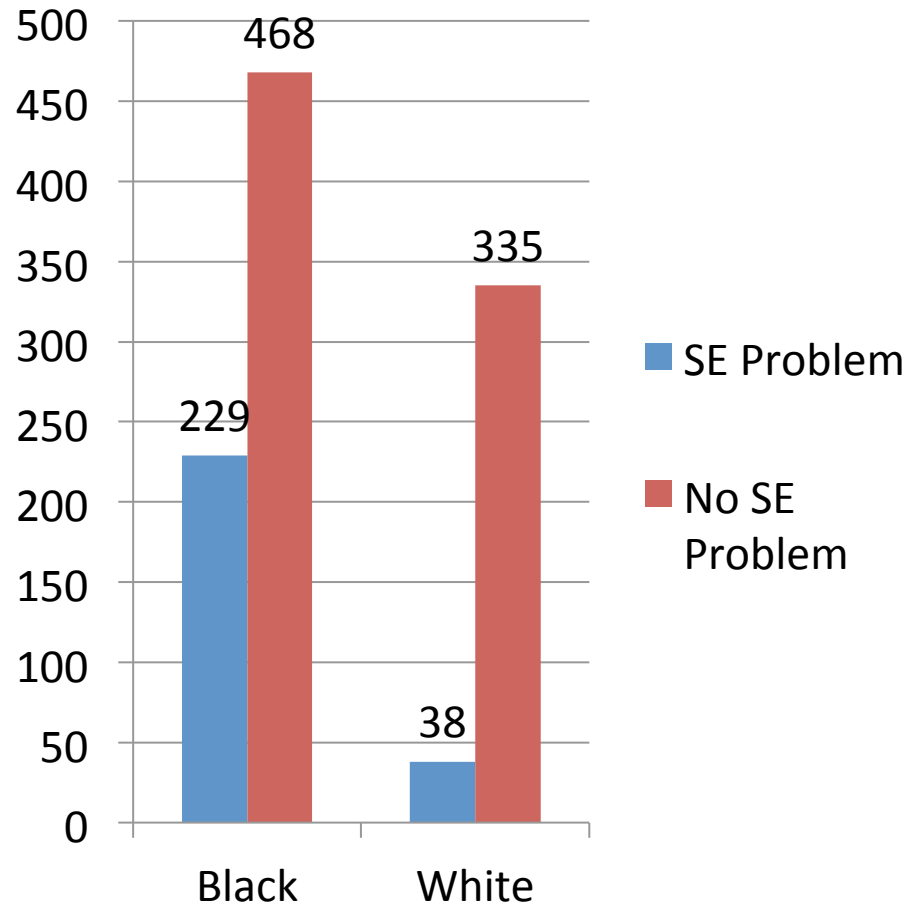
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CANDLE Child Outcome Measures

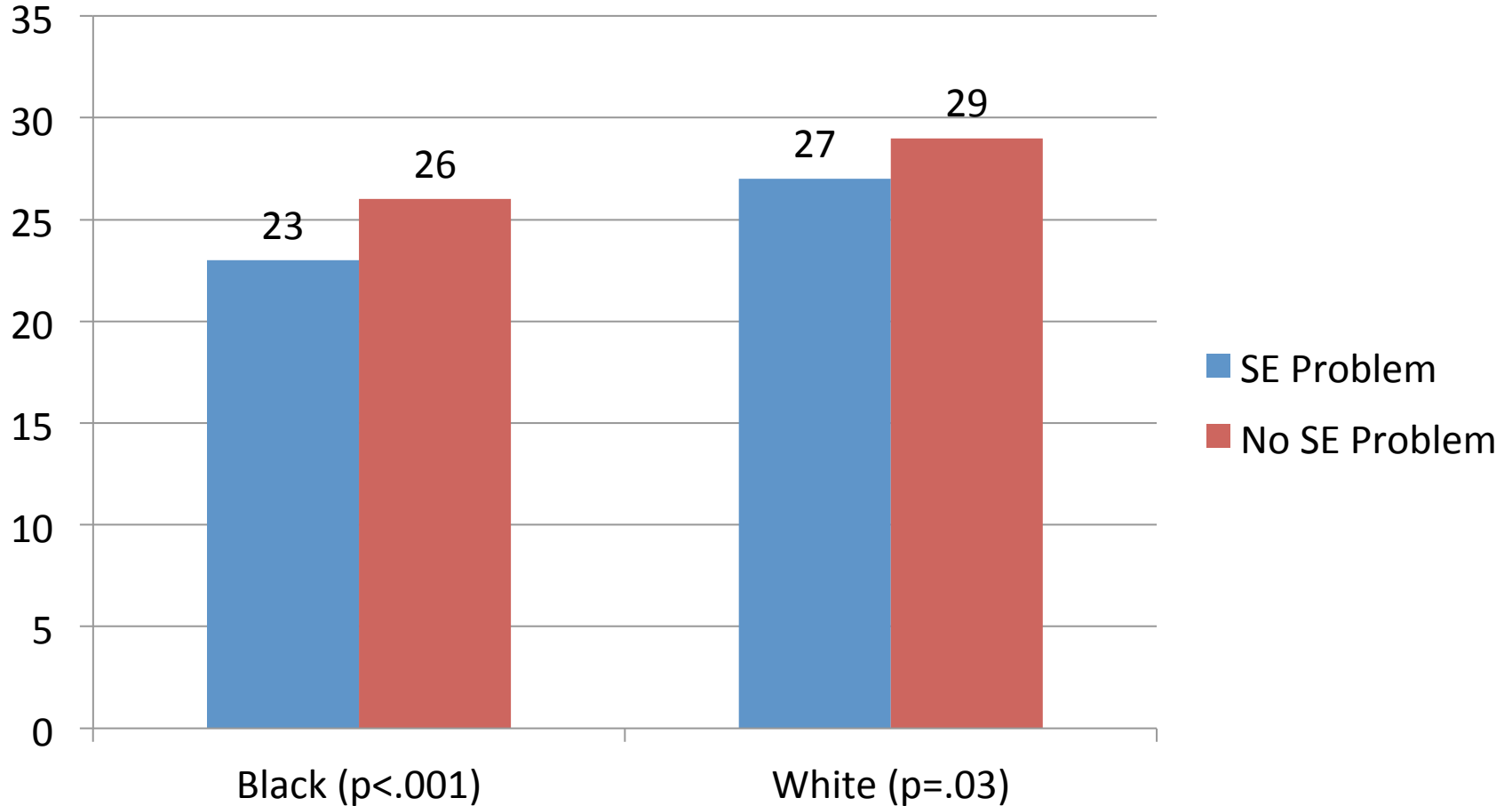
- Brief Infant Toddler Social Emotional Assessment (BITSEA)
 - Parent report, 42 items
 - Possible SE Problem at 12 months (25%ile)
- Bayley Scales of Infant and Toddler Development - III
 - At 12 months: screener (Risk/Emerging vs. Competent)
 - At 24 months: Standard scores
 - Cognitive Composite Score
 - Non-language Score
 - Language Composite Score

CANDLE Sample at One Year: SE Problem by Race

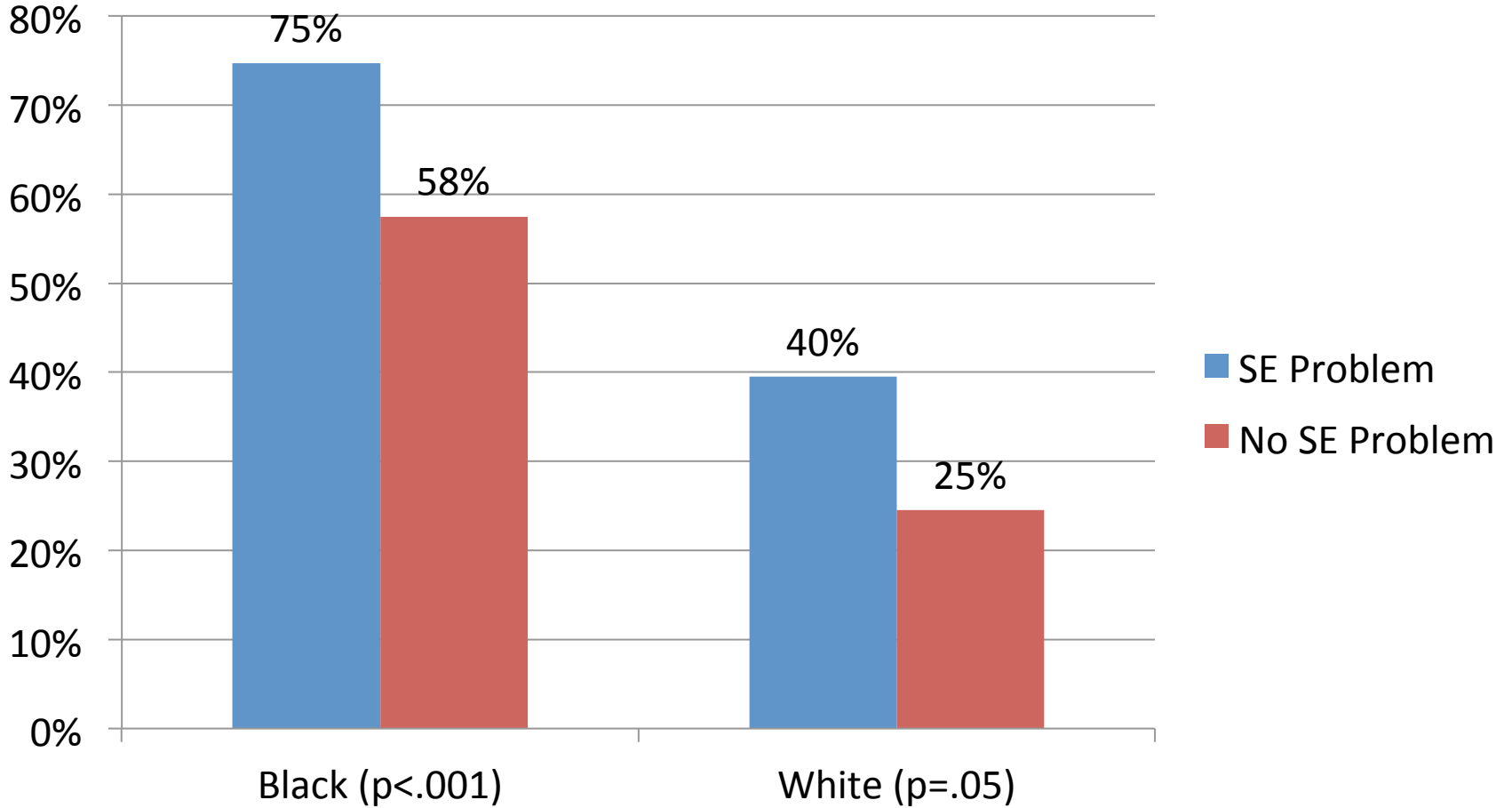
- N= 1070
 - Black 697
 - White 373
- SE Problems
 - Black 32.8%
 - White 10.2%



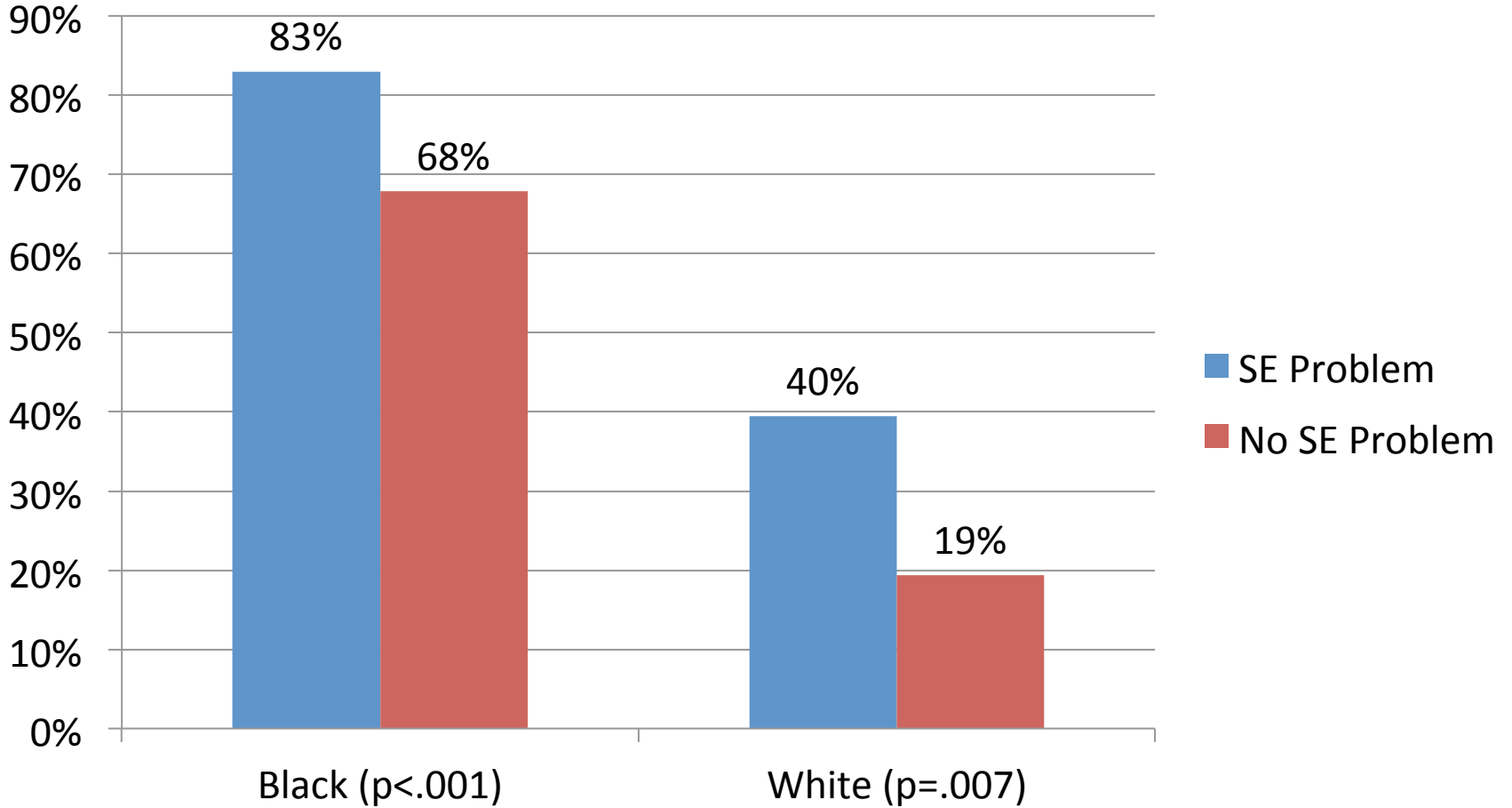
Maternal Age (Yrs) and SE Problem



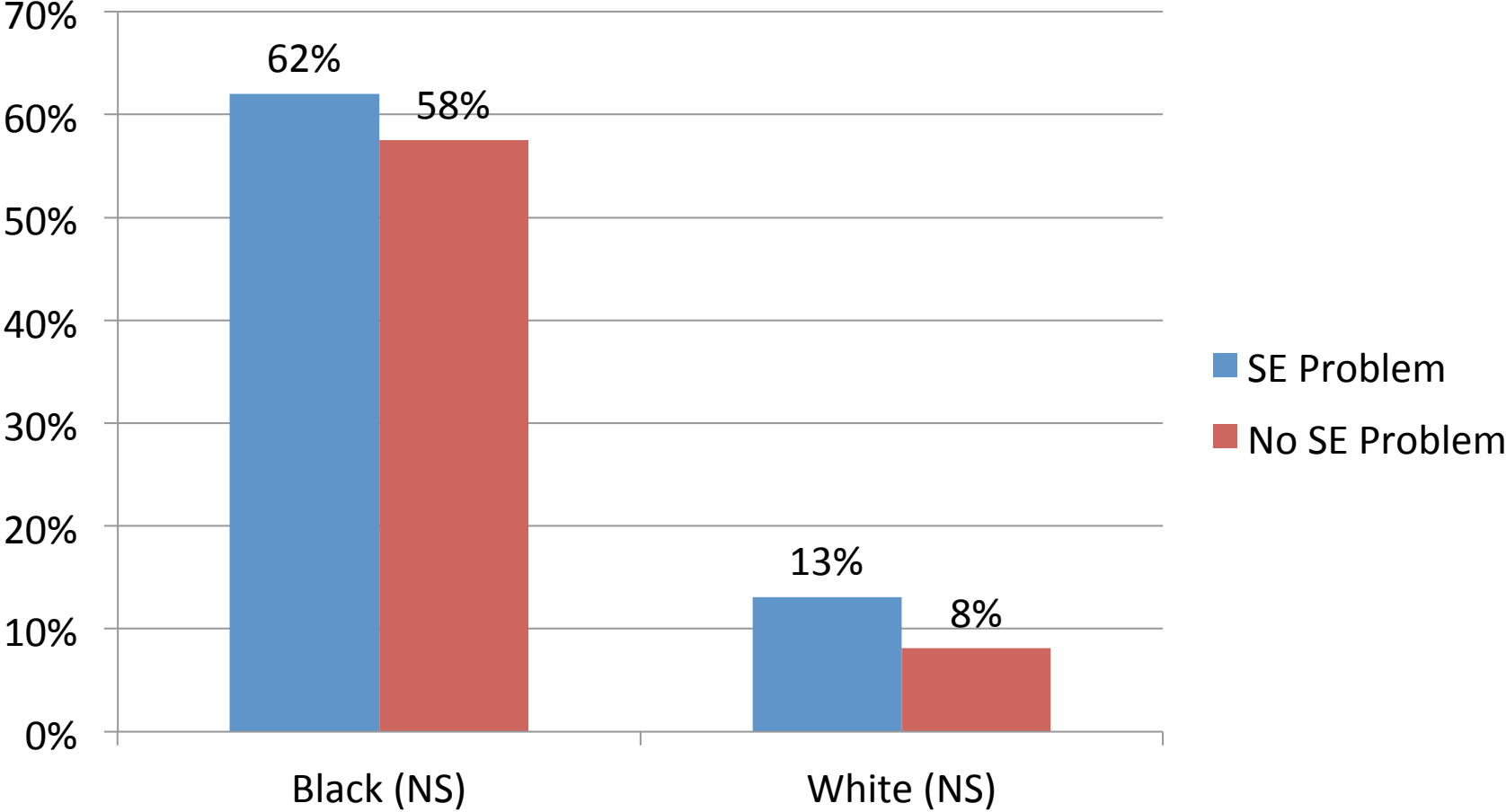
SE Problem and \leq HS Education (%)



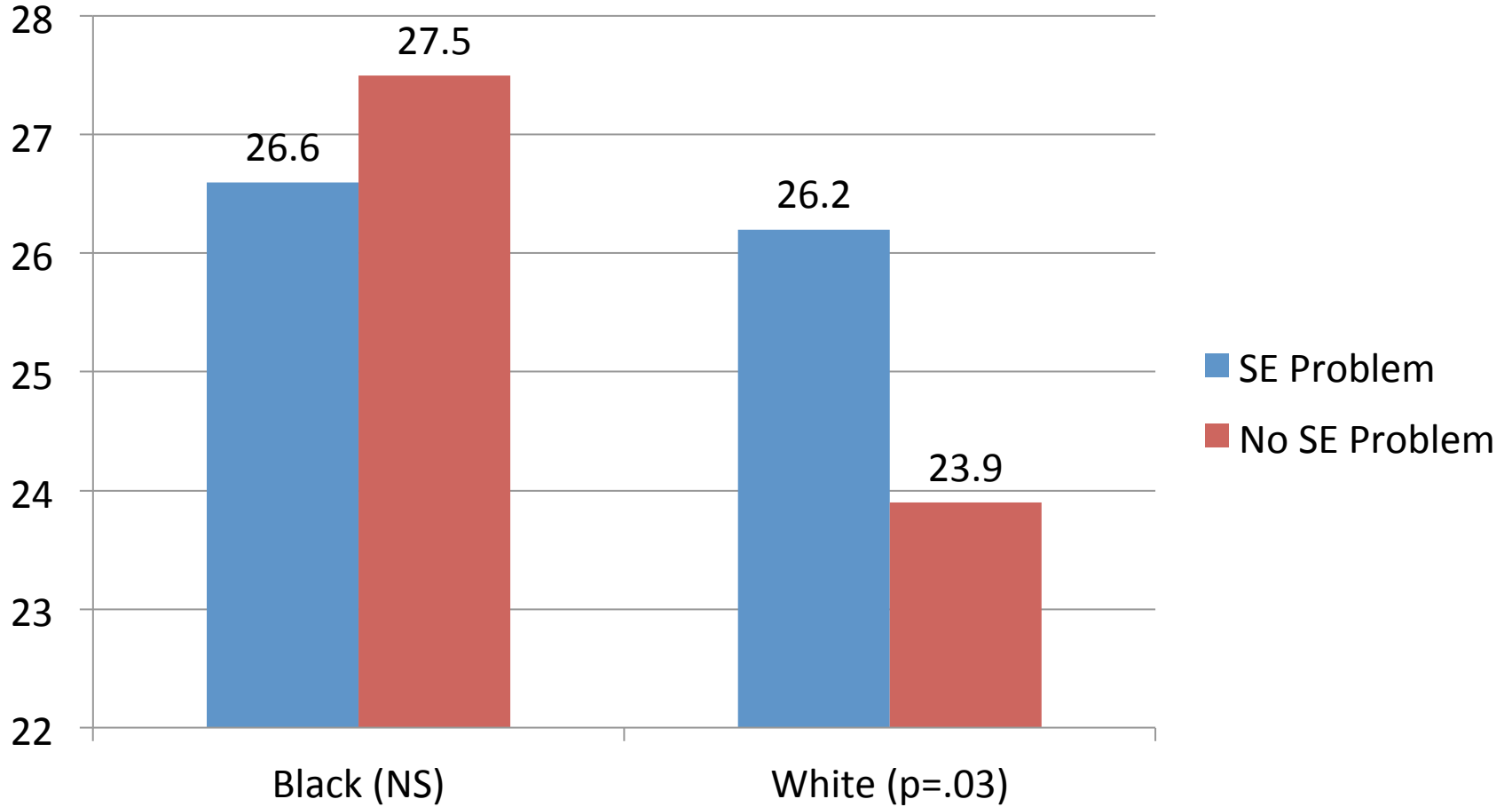
SE Problems and TennCare (%)



Family Structure and SE Problems: Mother Only (%)

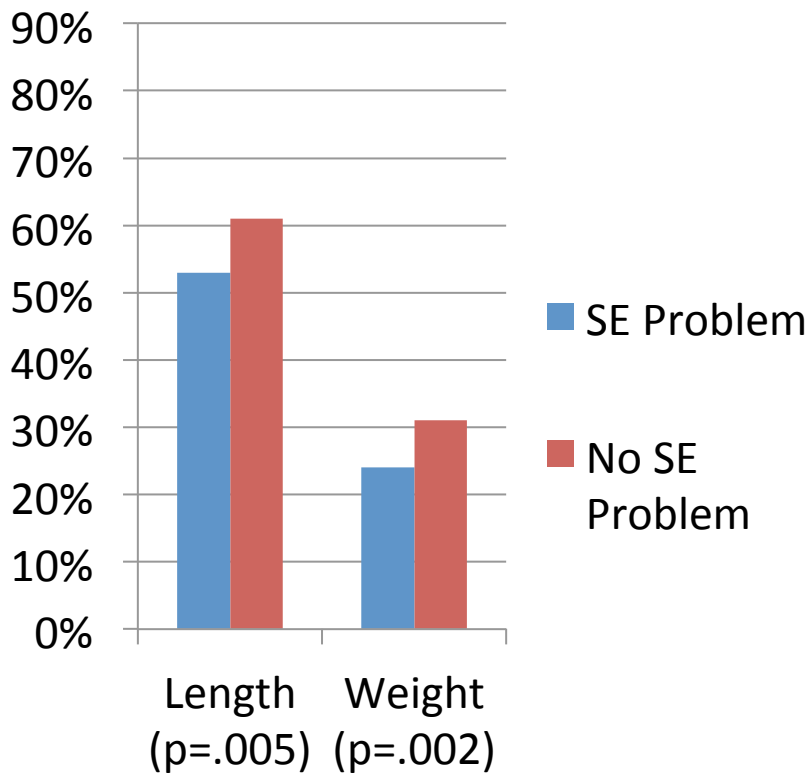


SE Problems and Maternal BMI

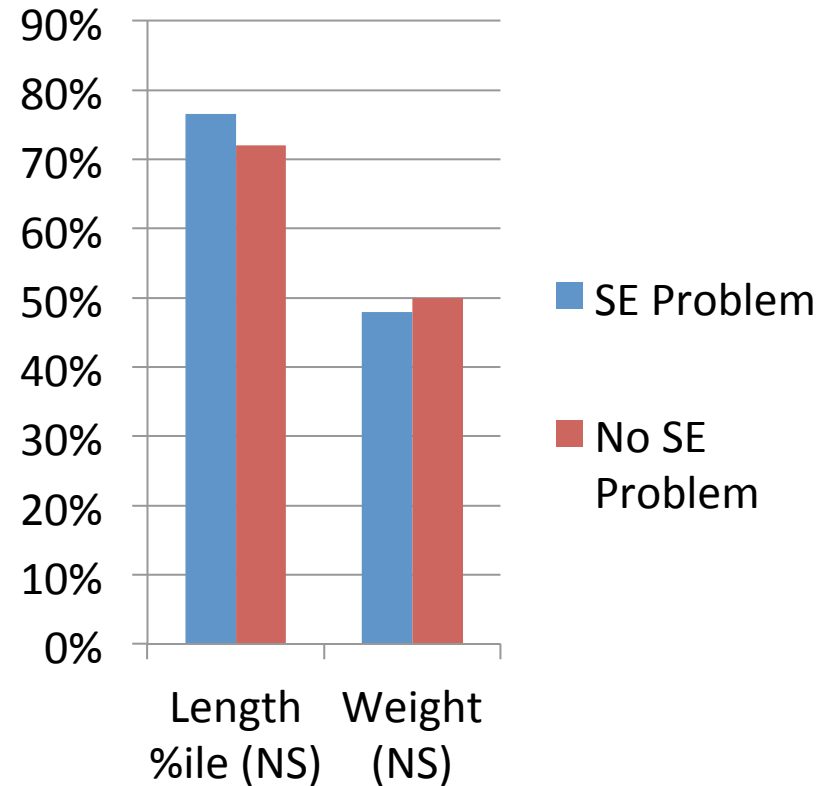


Intrauterine Growth (%ile at birth) and SE Problems

Black Newborns



White Newborns



Maternal Mental Health and SE Problems

Characteristics	Black (n=697)			White (n=373)		
	OR (95% CI)	SD/Unit	<i>P Value</i>	OR (95% CI)	SD/Unit	<i>P Value</i>
EPDS						
4 weeks	1.59 (1.35-1.89)	4.31	<.001	1.98 (1.42-2.77)	3.46	<.001
1 year	1.81 (1.53-2.14)	4.26	<.001	1.80 (1.35-2.39)	3.88	<.001
TEMPS (Scaled Score)						
Cyclothymic	1.68 (1.43-1.98)	2.78	<.001	2.00 (1.54-2.60)	2.68	<.001
Dysthymic	1.32 (1.13-1.54)	1.29	<.001	1.67 (1.20-2.31)	1.43	.002
Hyperthymic	0.72 (0.61-0.84)	1.96	<.001	0.59 (0.43-0.80)	2.35	<.001
Irritable	1.48 (1.26-1.73)	1.54	<.001	1.80 (1.36-2.38)	1.28	<.001
CAPI : Risk for Abuse cutoff (Ref normal)	3.30 (2.09-5.23)	1	<.001	4.54 (1.74-11.89)	1	.002
Parenting Stress Index	2.39 (2.00-2.84)	31.64	<.001	2.38 (1.67-3.38)	28.31	<.001
Global Severity Index	1.65 (1.38-1.96)	9.64	<.001	2.02 (1.39-2.93)	8.77	<.001

- All maternal MH variables were associated with SE Problem status in bivariate analyses

Multivariable Models Predicting Likelihood of SE Problems

Variable	Black (N=697)			White (N=373)		
	OR (95%CI)	SD/Unit	p	OR (95%CI)	SD/Unit	p
Insurance	-	-	-	3.4 (1.3-9.4)	1	.002
Mat Ed	1.9 (1.2-3.0)	1	.003	-	-	-
Sex	-	-	-	3.6 (1.3-9.7)	1	.01
EPDS@1y	-	-	-	0.5 (0.3-1.0)	3.9	.05
Total stress	1.8 (1.4-2.3)	31.6	<.001	2.5 (1.5-4.2)	28.1	<.001
Global Severity Index	1.3 (1.0-1.7)	10.5	.04	3.6 (1.7-7.9)	10.0	.001
Cyclothymic	1.4 (1.1-1.7)	2.8	.002	-	-	-
Dysthymic	-	-	-	1.7 (1.0-2.7)	1.4	.04

Multivariable Models Predicting Likelihood of SE Problems

Variable	Black (N=697)			White (N=373)		
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Insurance	-	-	-	3.4 (1.3-9.4)	1	.002
Mat Ed	1.9 (1.2-3.0)	1	.003	-	-	-
Sex	-	-	-	3.6 (1.3-9.7)	1	.01
EPDS@1y	-	-	-	0.5 (0.3-1.0)	3.9	.05
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Cyclothymic	1.4 (1.1-1.7)	2.8	.002	-	-	-
Dysthymic	-	-	-	1.7 (1.0-2.7)	1.4	.04

Conclusions: SE Development

- Increased parenting stress and severity of maternal psychological distress is associated with reported SE problems in one-year-olds.
- Temperamental styles are associated with SE problems
- Maternal education is associated, at least in blacks
- Lower income (TennCare) is associated, at least in whites.
- Interventions should target risk groups. High index of suspicion.
 - Younger mothers
 - \leq HS education
 - Mothers reporting parenting stress or MH symptoms
- Bi-generational approaches to treatment should be evaluated, supported

Predictors of Verbal Cognition at 2 Years

Variable	Black (N=556)			White (N=267)		
	Estimate	SE	p	Estimate	SE	p
Mat Ed	-	-	-	-8.30	3.18	.001
BMI	-	-	-	-0.57	0.19	.003
EPDS @ 4w	-0.42	0.17	.017	-	-	-
Abuse Risk	-5.47	2.45	.026	-	-	-
Sex	5.17	1.41	<.001	5.63	2.35	.018
RC Risk 1yr	-5.48	1.62	<.001	-6.80	2.97	.023

Predictors of Nonverbal Cognition at 2years

Variable	Black (N=556)			White (N=267)		
	Estimate	SE	p	Estimate	SE	p
Mat Cogn	0.14	0.04	.001	0.29	0.08	<.001
BMI	-	-	-	-0.31	0.15	.042
Total Stress	-	-	-	-0.07	0.03	.030
HOME total	-	-	-	0.55	0.24	.021
Abuse Risk	-4.85	1.76	.006	-	-	-
Sex	2.26	1.09	.040	-	-	-
Gest Age	0.82	0.34	.018	-	-	-

Predictors of Composite Cognitive Development at 2 Years

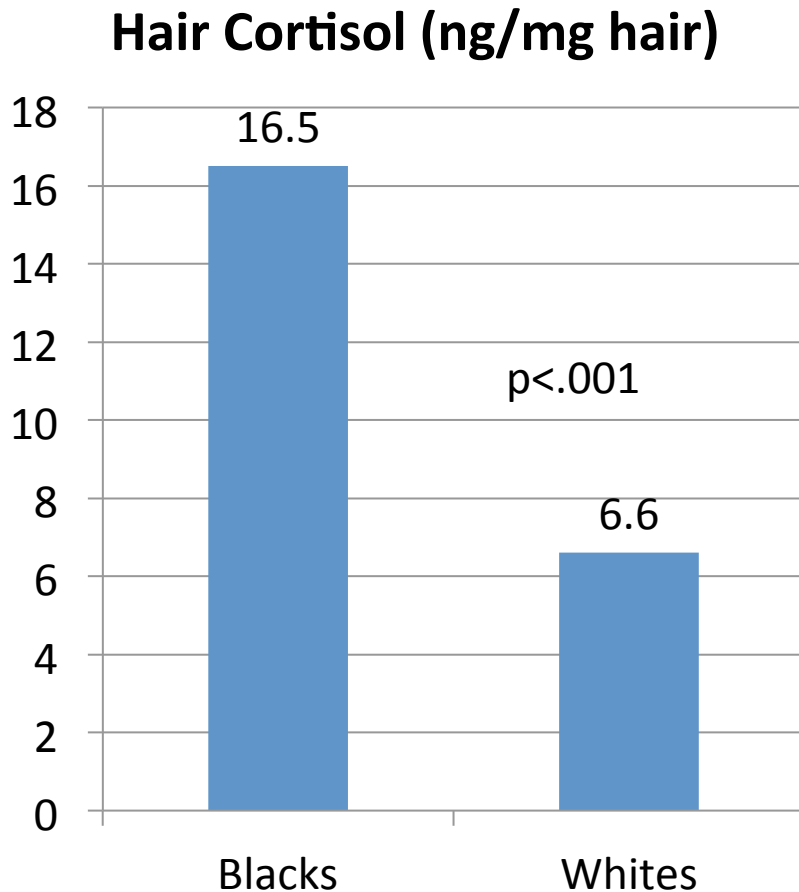
Variable	Black (N=556)			White (N=267)		
	Estimate	SE	p	Estimate	SE	p
Mat Ed	-	-	-	-5.23	2.43	.033
Mat Cogn	-	-	-	0.22	0.09	.012
BMI	-	-	-	-0.39	0.15	.010
Total Stress	-	-	-	-0.06	0.03	.031
HOME total	-	-	-	0.46	0.23	.045
Abuse Risk	-6.11	2.06	.003	-	-	-
Sex	2.94	1.19	.014	3.73	1.76	.036
BW %ile	-	-	-	0.09	0.03	.008
W/H @ 2y	-	-	-	-0.06	0.03	.040
RC Risk 1yr	-4.65	1.39	<.001	-	-	-
Insurance	-3.37	1.22	.006	-	-	-

Conclusions: Cognitive Development

- Associated factors in both races
 - Boys
 - Early language dev
 - Mat cognitive abilities
- In Whites:
 - Maternal education
 - Parenting stress
 - BMI
 - HOME resources
- In Blacks
 - Abuse risk
 - Medicaid
- Language risk can be identified in one-year-olds
- Parent “risk for abuse” is a potential marker for child cognitive effects
- Boys



Hair Cortisol in One-Year-Olds



- B: N=175; W: N=122
- Higher hair cortisol in Black one-year-olds
- Higher hair cortisol with
 - Lower birth length, 1y hgt
 - Greater parenting stress
 - Greater maternal psychological distress (Whites only)
- Lower hair cortisol
 - Higher maternal depression score (Blacks only)

Multivariate Models Predicting Hair Cortisol in One-Year-Olds

Variable	Black (N=175) R-square=0.0786			White (N=122) R-square=0.2139			Entire Sample (N=297) R-square=0.1082		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
BL %ile	-0.421	.204	.04	-0.519	.139	<.001	-0.475	.126	<.001
Hgt %ile 1y	0.358	.202	.08	0.258	.123	.04	0.363	.122	.003
Parenting Stress	0.435	.203	.03	0.449	.150	.004	0.440	.135	.001
EPDS 1y	-3.611	1.450	.01	-2.500	1.428	.08	-2.493	.966	0.10
GSI	-	-	-	1.298	.583	.03	-	-	-

Special thanks to CANDLE study mothers, children and their families

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