Confirmatory factor analysis: Revising a parenting outcome expectancy scale for sex-related discussions with adolescents

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Parent-Adolescent Communication About Sex

- Parents have long been recognized as the primary sexuality educators of their children
- Some studies indicate that adolescents who report more discussions with parents are more likely to delay intercourse [1-3]
- It has been demonstrated that when parents are open, skilled, and comfortable, adolescents are less likely to practice risky sexual behavior [4,5]

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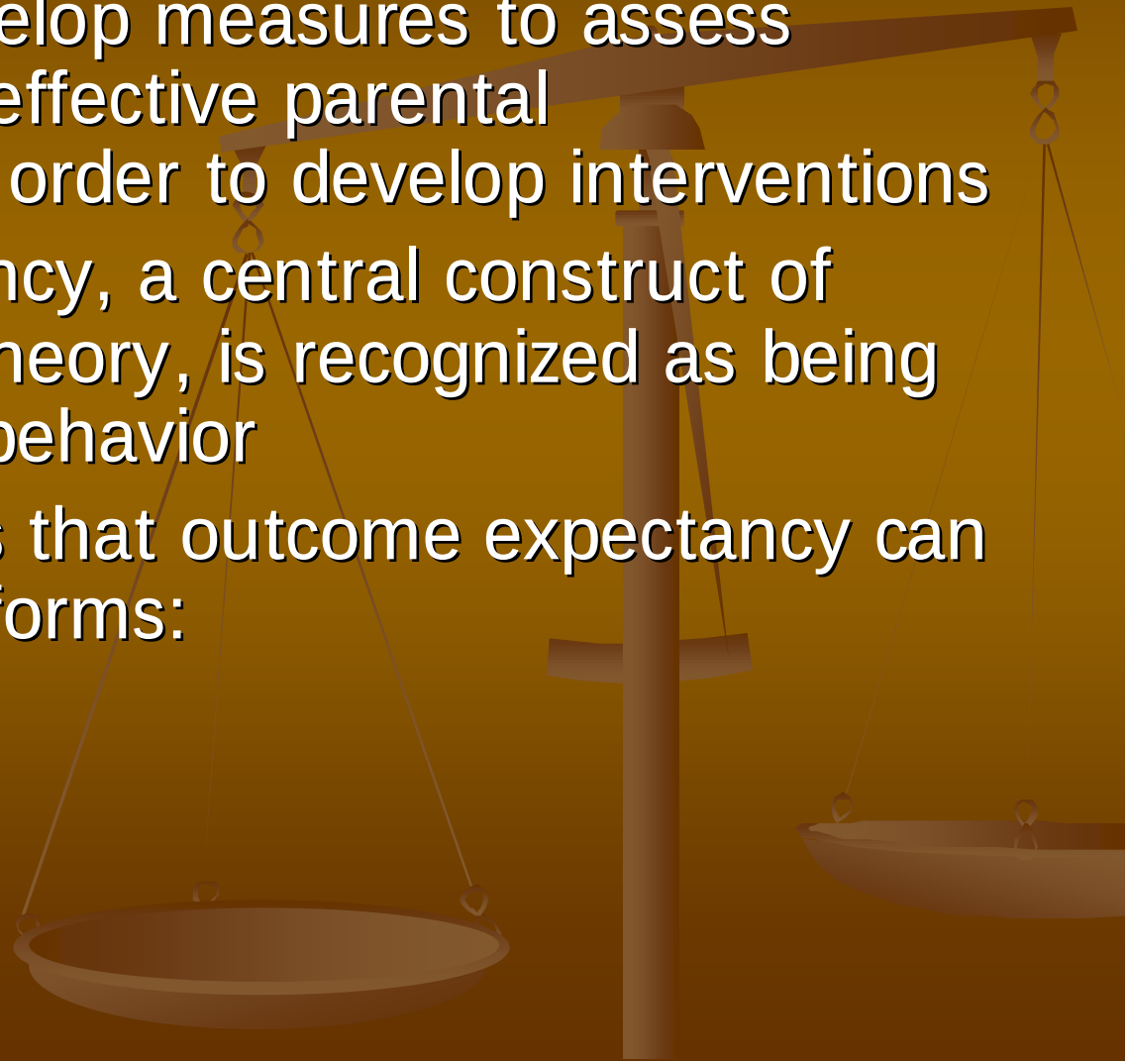
Measurement of Parental Characteristics

- It is critical to develop measures to assess characteristics of effective parental communication in order to develop interventions
- Outcome expectancy, a central construct of Social Cognitive Theory, is recognized as being useful to explore behavior
- Bandura [6] notes that outcome expectancy can take three major forms:
  - Self-evaluative
  - Social
  - Physical



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Theoretical Basis for Structure

- In 2001 exploratory factor analysis was performed on a 15 item scale assessing parental outcome expectancy related to discussions about sex [7]
  - 494 mothers and children of both sexes aged 11-14
- Three factors emerged:
  - Cognitive self-evaluative outcome expectancy
  - Emotional self-evaluative outcome expectancy
  - Social outcome expectancy

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The Results [7]

	Factor		
	1	2	3
If you talk with your adolescent about sex topics			
you will feel like a responsible parent	.944		
you will feel that you did the right thing	.903		
you will be proud	.526		
you will be embarrassed		.737	
you will feel comfortable		.676	
you would finds some things difficult to talk about		.632	
it would be unpleasant		.473	
you will feel ashamed		.470	
you will find these issues easy to talk about		.467	
you think he or she will listen		.204	.217
your adolescent will be less likely to get pregnant/get a girl pregnant			.700
your adolescent will be less likely to have sexual intercourse as a young teen			.667
you think it will do some good			.411
you will feel relieved			.382
your adolescent will do what he/she wants no matter what you say			.275

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Update Scale, Two New Samples

- Eight items were added in response to recommendations made in the earlier study [7]
  - Two cognitive self-evaluative outcome expectancy items
  - Six social outcome expectancy items
- A sample of 281 mothers with children of both sexes as part of an educational intervention designed to prevent sexual risk-taking among children ages 6-12 (Final n=263) [8]
- A sample of 250 fathers with sons aged 11-14 as part of an intervention designed to promote father-son communication about HIV-prevention behaviors (Final n=201) [9]

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Added Questions

- Two questions were added to Cognitive [8,9]
  - You will have done what parents should do
  - Your adolescent will know where you stand on teens having sex
- Six questions were added to Social [8,9]
  - Your adolescent will be embarrassed
  - Your adolescent will not want to talk to you
  - Your adolescent will remember your discussion when he is older
  - Your adolescent will appreciate your willingness to provide further information
  - Your adolescent will be uncomfortable during your discussions
  - Your adolescent wil be more able to resist peer pressure to have sex

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The Analysis

- Tasks
  - Confirm the existing scale (3 items removed)
  - Confirm the scale with the additional items
- The response categories have five levels
- The data were skewed
- Requires
  - Data coded as ordinal
  - Method of Estimation: Diagonally Weighted Least Squares (DWLS) [10]
  - Analysis of a polychoric correlation matrix
    - Output a correlation matrix of the data
    - Output an asymptotic covariance matrix of the sample correlations

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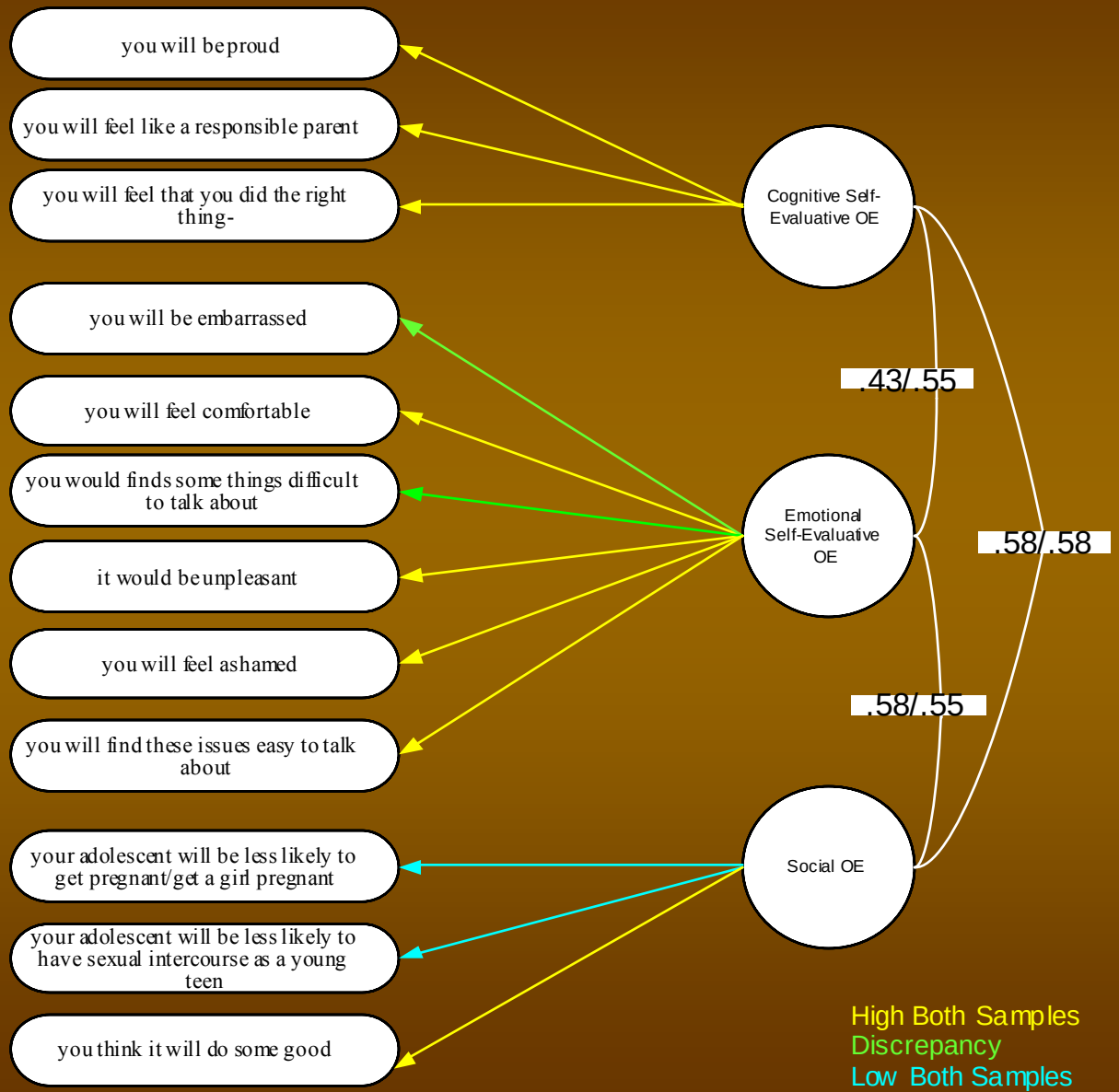
The 12 Item Scale



Model Fit/Reliability/Validity

Measure	Mothers	Fathers
X^2/df	2.03	1.36
GFI	.99	.98
RMSEA	.063	.043
Scale α	.81	.80
F1 α	.81	.77
F2 α	.85	.79
F3 α	.53	.68
Talk About Sex	.45**	.22**
Intend to Talk About Sex	.15	.38**
Talk About Other Topics	.26**	.29**

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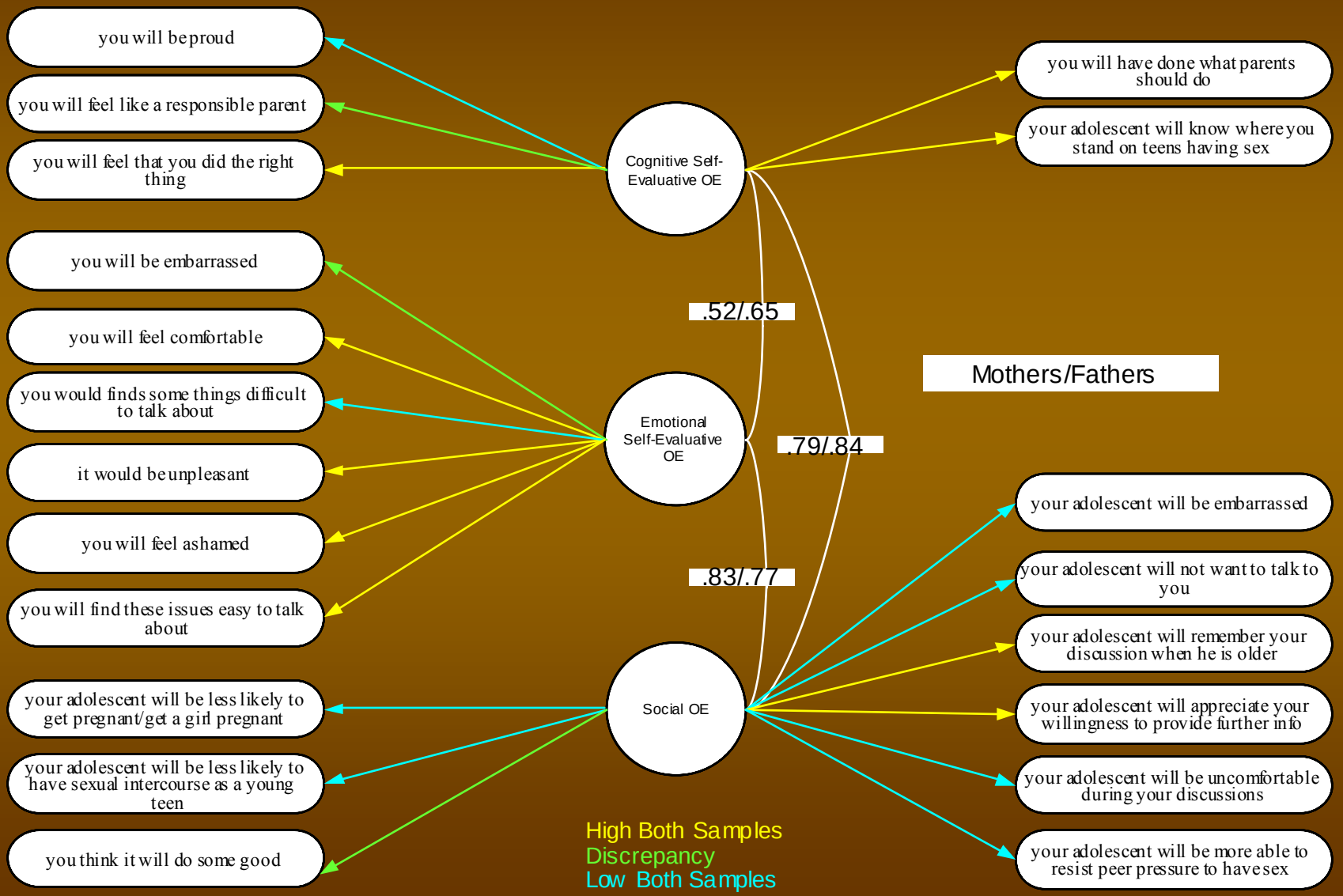
The 20 Item Scale



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Results

Model Fit/Reliability/Validity		
Measure	Mothers	Fathers
X^2/df	3.31	2.77
GFI	.95	.94
RMSEA	.09	.09
Scale α	.88	.87
F1 α	.81	.74
F2 α	.85	.79
F3 α	.75	.75
Talk About Sex	.46**	.26**
Intend to Talk About Sex	.21**	.40**
Talk About Other Topics	.30**	.29**

- The fit indices indicate that the model is approaching a less than acceptable fit (RMSEA > .08) [11]
- Correlations between the scale and having talked about sex were significant and positive
- Internal consistency was acceptable to high across both groups
- Many of the items under social outcome expectancy loaded quite low
- There is a high correlation between factors:
  - Between Social and Cognitive (r=.79/84)
  - Between Social and Emotional (r=.83/77)

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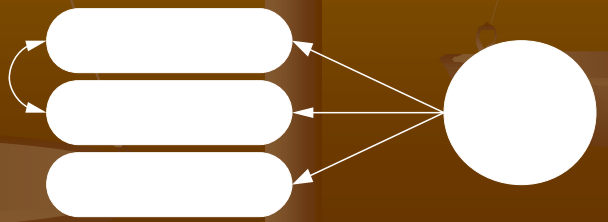
What Else Can Be Done?

Leaving Confirmatory Factor Analysis…Entering Exploratory Factor Analysis

- Modification Indices
  - Indicate additional parameters that would improve the fit of the model
  - There were no factor loadings—only correlated measurement error between items
- Next Step
  - Examine questions for similarities
  - Examine modification indices—high correlated measurement error may be a sign that there is relationship between the two items that has not been accounted for in the model [12]



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Social Outcome Expectancy Items

- Your adolescent will be less likely to get pregnant/get a girl pregnant
- Your adolescent will be less likely to have sexual intercourse as a young teen
- Your adolescent will be able to resist peer pressure to have sex
- You think it will do some good
- Your adolescent will remember your discussion when he is older
- Your adolescent will appreciate your willingness to provide further information
- Your adolescent will be uncomfortable during your discussions
- Your adolescent will be embarrassed
- Your adolescent will not want to talk to you

	d11	d12	d13	d14	d16	d17
d13	33.9	0.8	- -			
d14	0.0	4.9	0.0	- -		
d16	1.5	- -	4.7	- -		
d17	8.3	2.4	6.0	1.0	- -	
d18	0.7	2.6	1.3	0.2	17.1	0.8
d19	0.0	2.9	0.5	0.2	19.7	5.9
d20	12.7	3.1	0.5	0.2	17.5	10.7
d21	1.9	16.9	4.6	0.2	- -	91.1
d22	16.1	1.4	24.7	0.2	2.5	5.2
d23	6.6	3.3	15.0	0.9	1.5	0.4

	m11	m12	m13	m14	m16	m17
m13	32.1	0.6	- -			
m14	0.1	14.6	0.9	- -		
m16	4.9	17.0	3.1	30.2	- -	
m17	8.8	21.7	2.5	3.0	40.9	- -
m18	4.2	5.6	1.3	3.7	10.0	1.3
m19	1.1	1.1	2.1	0.2	13.4	2.4
m20	3.4	0.2	4.0	0.1	14.5	0.8
m21	9.9	208.8	2.3	109.0	312.9	- -
m22	140.8	1.6	85.3	8.5	5.3	11.0
m23	17.9	8.0	0.0	7.4	17.7	2.1

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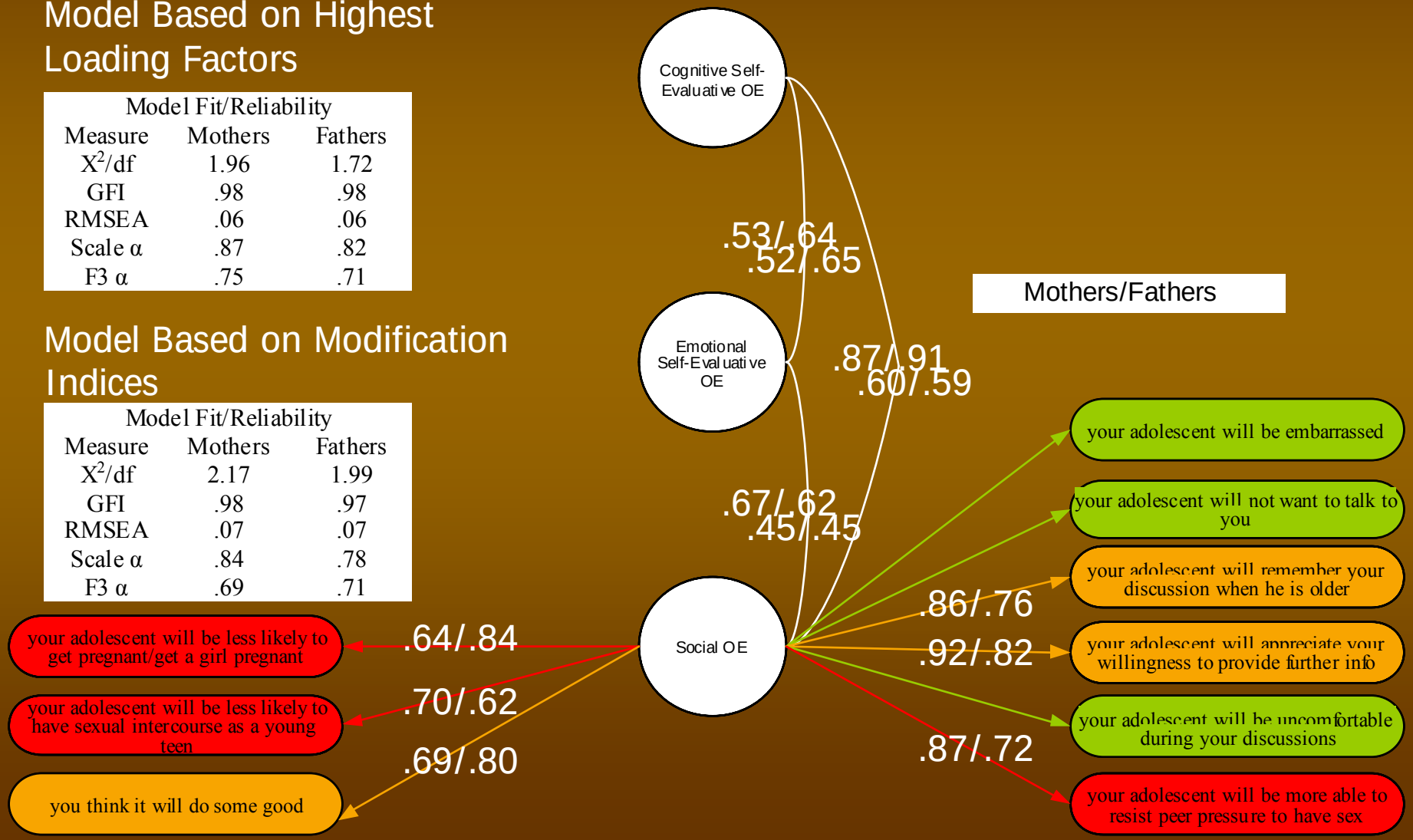
Testing Model Modifications—Effect of Altering the Third Factor

Model Based on Highest Loading Factors

Model Fit/Reliability		
Measure	Mothers	Fathers
X^2/df	1.96	1.72
GFI	.98	.98
RMSEA	.06	.06
Scale α	.87	.82
F3 α	.75	.71

Model Based on Modification Indices

Model Fit/Reliability		
Measure	Mothers	Fathers
X^2/df	2.17	1.99
GFI	.98	.97
RMSEA	.07	.07
Scale α	.84	.78
F3 α	.69	.71



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Conclusions

- The 12 item version of the scale performs very well across mothers of adolescents, mothers of children 6 -12, and fathers of adolescents
- The 20 item scale introduced items to the social outcome expectancy factor that may be closely related to the cognitive self-evaluative outcome expectancy factor
- Further research is needed to refine the social outcome expectancy factor

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Implications

- Outcome expectancy is a key construct in Social Cognitive Theory, one of the most often applied theories in behavioral change interventions
- The 12 item or the 20 item scale may be used to measure outcome expectancy for mothers and fathers in intervention research aimed at increasing sex-based communication between parents and children or adolescents

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