



Evidence2Success: Improving Our Children's Futures

Similarities and Differences in Risk and Protection across Ethnic Groups: Tests of Invariance in Predicting Problem Behaviors in Adolescence

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Research Question

Are relationships of risk and protective factors with adolescent problem behaviors similar across ethnic groups?



The Value of this Question

Communities employing established surveys of risk and protective factors must have confidence that measures are reliable and valid for all members of the community

**** We are *not examining* similarities and differences in *mean levels* of risk, protection and problem behaviors across ethnic groups**



Previous Studies

Gottfredsen & Koper (1997)

- **Groups:** African Americans and Whites; grades 6-10 combined
- **Results:** similar reliability for 12 risk factors; similar validity predicting measures of drug use

Rosay, Gottfredson, Armstrong & Harmon (2000)

- **Groups:** 5 ethnic groups; gender; grades 6-12 combined
- **Results:** replication of Gottfredsen & Koper found no substantive differences in reliability or validity by ethnicity; some trivial differences in validity by gender

Glaser, Van Horn, Arthur, Hawkins & Catalano (2005)

- **Groups:** 5 ethnic groups; gender; grades 6, 8, 10 & 12 separated
- **Results:** similar reliability of risk and protective factors from Communities that Care survey by gender and ethnicity; reliability varied across grades



What this Study Adds

Separate analyses for **middle and high school** to address differences in reliability of risk and protective factor across grades

More comprehensive list of risk and protective factors

Simultaneous comparison of risk or protective factors with problem behaviors

Analyses with **measured variables** as opposed to latent constructs is more representative of how communities use survey results



Sample

All 6 – 12 grade students that reported White, African American or Latino as “best” description of self

Within Grade Percentages by Ethnicity

Grade	White	African American	Latino	Total
6	11%	17%	72%	1057
8	9%	20%	71%	1069
10	13%	16%	70%	887
12	10%	24%	66%	774
All Grades	11% 400	19% 729	70% 2648	100% 3777

Reliabilities

ASB = antisocial behavior

MS **HS**

PS = Prosocial

MS **HS**

Risk Factors

alpha

	MS	HS
Community		
Low neighborhood attachment	.80	.82
Community disorganization	.85	.86
Transitions and mobility	.53	.51
Perceived availability of drugs	.84	.87
Perceived availability of guns	-	-
Racial discrimination	-	.68
School		
Academic failure	-	-
Low commitment to school	.73	.77
Past grade retention	-	-
Family		
Poor family management	.80	.82
Family conflict	.81	.81
Household adult involved in ASB	-	.72
Parents favoring drug use	.74	.74
Parents favoring ASB	.78	.81
Rebelliousness	.77	.76
Early initiation of ASB	-	.62
Early initiation of drug use	.67	.74
Low perceived risk for drug use	.93	.84
Peer / Individual		
Friends involved in ASB	.76	.85
Friends involved in drugs	.80	.77
Friends involved in gangs	-	-
Victim of bullying	.80	.86
Dating violence	-	-
Employed >20 hrs	-	-

Protective Factors

alpha

	MS	HS
Comm.		
PS opportunities	.79	.81
Rewards for PS involvement	.85	.90
Collective efficacy	-	.77
School		
PS opportunities	.64	.69
Rewards for PS involvement	.68	.69
Academic self-efficacy	.88	.91
Attachment to parents	.77	.74
Family		
PS opportunities	.85	.87
Rewards for PS involvement	.72	.73
Positive discipline	.61	.58
Parent involvement in education	.74	.77
Clear standards for behavior	.55	.53
Peer / Ind.		
Social skills	.46	.52
PS friends	.60	.72
PS involvement	.68	.69
Rewards for PS involvement	.64	.76
Exercise / Physical activity	-	-

Problem Behaviors

alpha

	MS	HS
Ind.		
Antisocial behavior	.55	.51
Delinquency	.81	.88
School suspensions	-	-



Defining Approaches

Equivalent = Invariant

Non-Equivalent = Non-Invariant

Reliability = Factorial Invariance

Measurement Models compared across groups

Validity = Structural Invariance

Covariance Matrices compared across groups



Multiple Group Structural Equation Models

Tested the equivalence of covariance structure for 41 risk and protective factors in predicting 3 problem behaviors: delinquency, antisocial behavior and school suspensions across three ethnic groups

Separate models for risk and protective factors in middle school (grades 6 & 8) and high school (grades 10 & 12)

- All variables were standardized within grade prior to combination across grades

12 models were tested across ethnic groups



Multiple Group Structural Equation Models

Step 1

Estimate an ***unconstrained model*** where all relationships (covariances) among risk or protective factors and problem behaviors are estimated freely

Step 2

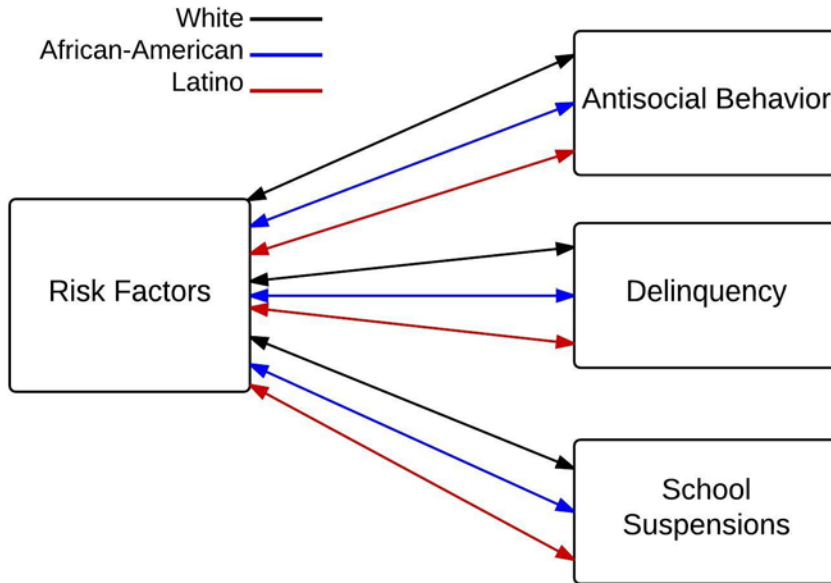
Estimate a ***constrained model*** where relationships between risk or protective factors and problem behaviors are held equal across the groups being compared

Step 3

Compare ***fit statistics*** for constrained and unconstrained models
Models that are ***equally valid*** (structurally invariant) across groups ***will not show differences*** in fit between models



Testing Differences in Validity for Risk Factors



Middle School

Model 1: **Latino** vs. White

Model 2: **African American** vs. White

Model 3: **Latino** vs. **African American**

High School

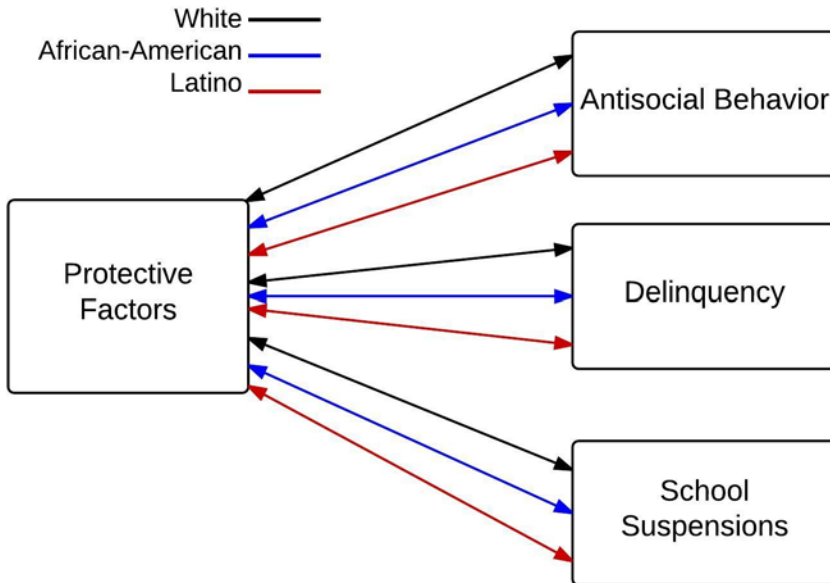
Model 4: **Latino** vs. White

Model 5: **African American** vs. White

Model 6: **Latino** vs. **African American**



Testing Differences in Validity for Protective Factors



Middle School

Model 7: **Latino** vs. White

Model 8: **African American** vs. White

Model 9: **Latino** vs. **African American**

High School

Model 10: **Latino** vs. White

Model 11: **African American** vs. White

Model 12: **Latino** vs. **African American**



Model Results

Comparative Fit Index

Risk Factors with Problem Behaviors

Middle School

High School

	Latino vs. White	African American vs. White	Latino vs. African American	Latino vs. White	African American vs. White	Latino vs. African American
CFI	.998	.999	.999	.997	.986	.996
Δ CFI	.002	.001	.001	.003	.014	.004

Protective Factors with Problem Behaviors

Middle School

High School

	Latino vs. White	African American vs. White	Latino vs. African American	Latino vs. White	African American vs. White	Latino vs. African American
CFI	.999	.996	1.00	.999	.996	.999
Δ CFI	.001	.004	.000	.001	.004	.001

* CFI = 1 for all unconstrained models



Model Results

11 of 12 models fully equivalent

1 model suggested partial non-equivalence:

Model 5: High school risk factors with problem behaviors across African Americans and Whites

Non-equivalence was primarily produced by the relationship of one risk factor with one out of three problem behaviors:

Friends in Gangs with Delinquency

When this model was re-estimated with one path free to vary across groups, no differences were found between African Americans and Whites



Model Results

High School Friends in Gangs with Delinquency

Stronger relationship between friends in gangs and delinquency for African Americans than Whites

	White			African American		
	<u>Mean</u>	<u>SD</u>	<u>Covariance</u>	<u>Mean</u>	<u>SD</u>	<u>Covariance</u>
Delinquency	-.016	.96	.192	.146	1.03	.505
Friends in Gangs	-.192	.80		.086	1.08	

Relationships are in the theoretically expected direction



Conclusions

Across three ethnic groups and between middle and high school, measures were similarly reliable

Across three ethnic groups, risk and protective factors were equally valid predictors of delinquency, antisocial behavior and school suspensions

11 of 12 models were fully equivalent (structurally invariant) across ethnic groups

1 model was partially non-equivalent across African American and White High School students

All relationships in the theoretically expected direction



Implications

If differences in mean levels of risk, protection and problem behaviors are observed across ethnic groups, communities can be confident that these results are providing important information for differential targeting of interventions

Communities should be aware of developmental differences between Middle and High School that may influence targeting of interventions



THANK YOU!

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