

Sibling Influences on Adolescents'
Substance Use Orientations:
Testing Competing Pathways of
Social Influence

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Sibling Similarities in Substance Use

- Siblings have a marked influence on adolescents' alcohol and substance use (e.g., Conger & Rueter, 1996; Duncan et al., 1996; Rowe & Gulley, 1992)
- Sibling effects are greater than parental influences and possibly on a par with peer influences (e.g., Ary et al., 1993; Fagan & Najman, 2005; Windle, 2000)
- Sibling linkages are above and beyond contributions of shared genetics (e.g., McGue et al., 1996; Rende et al., 2005; Slomkowski et al., 2005)

Processes of Sibling Influence

- Social Learning Processes
 - Similarities in smoking and sexual activities most evident in dyads high in warmth and closeness (Rowe & Gulley, 1992; Slomkowski et al., 2005)
 - Similarities in alcohol use greatest for same gender pairs who were close in age (Boyle et al., 2001; Trim et al., 2006)
 - Modeling processes predictive of sibling similarities in youths' interests, activities, competencies, and risky behaviors (Whiteman et al., 2007a; 2007b; 2010)

Processes of Sibling Influence

- Sibling Conflict
 - Predicts deviancy and substance use (Bank et al., 2004; Brody et al., 2003; East & Khoo, 2005; Yeh & Lempers, 2004)
- Shared Peer Networks
 - Siblings' patterns of use are more strongly correlated when they share friends (Rende et al., 2005; Rowe & Gulley, 1992)

Study Goals

- Examine the relative contribution of different influence processes
 - Warmth and conflict would be positively related to sibling similarities
 - Similarities would be greatest when youth modeled and/or shared friends
 - Modeling and shared friends may interact

Participants

- One parent and two siblings from 326 families (978 participants)
 - Older siblings age ($M = 17.17, SD = .94$)
 - Younger siblings age ($M = 14.52, SD = 1.27$)
- 71% White, 23% African American
- Household income ranged from working to upper class

Procedure

- Families were identified from purchased marketing lists
- Telephone interviews with parents and youth interviewed separately.
- Participants received honorarium of \$35 (total of \$105 per family)

Measures

Construct	Source
Alcohol Use (Youth and Parents)	NIAAA Task Force on Recommended Alcohol Questions (2003)
Cigarette Use (Youth and Parents)	Monitoring the Future (Johnston et al., 2006)
Peer Alcohol and Cigarette Use	Youths' perceptions of frequency of peer use
Marijuana Use (Youth)	Monitoring the Future (Johnston et al., 2006)
Sibling Modeling	Whiteman et al. (2007b; 2010)
Sibling Intimacy	Blyth et al. (1982)
Sibling Negativity	Furman & Buhrmester (1985)
Shared Peer Networks	Trim et al. (2006)
Parents' Knowledge	Stattin & Kerr (2000); Kerr & Stattin (2000)

Analytic Strategy

- Series of logistic regression models
 - Model 1: Controls and IVs were entered
 - Controlled for parent education, family structure, age spacing, gender, gender composition, parental knowledge, peers' use, parents' use
 - Model 2: Three two-way interactions between older siblings' use, modeling, and shared friends
 - Model 3: Three-way interaction (older siblings' use X sibling modeling X shared friends)

Results: Alcohol Use

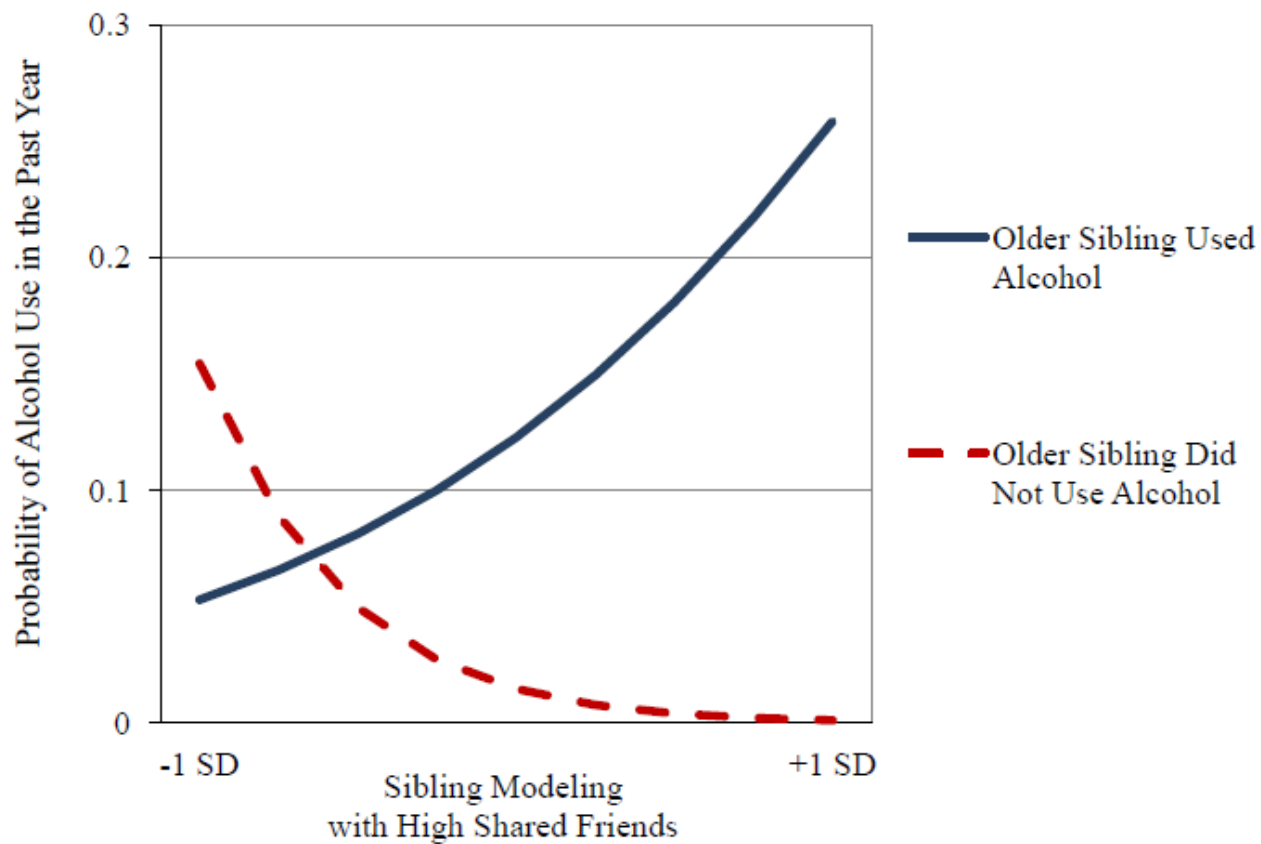
Table 1
Summary of Logistic Regression Analysis for Variables Predicting Younger Siblings' Alcohol Use (N=321)

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	<i>OR</i>	<i>B</i>	<i>SE B</i>	<i>OR</i>	<i>B</i>	<i>SE B</i>	<i>OR</i>
Intercept	-3.66***	.55		-4.01***	.65		-3.89***	.66	
Family Structure	.29	.39	1.35	.33	.39	1.39	.55	.42	1.73
Sex Composition (SC)	.38	.37	1.46	.39	.38	1.45	.64	.41	1.90
Friends' Alc Use	1.24***	.19	3.46	1.32***	.20	3.76	1.56***	.24	4.76
Sib's Alc Use (Sib Alc)	1.85***	.41	6.33	2.17***	.47	8.72	1.75***	.46	5.63
Parent's Alc Use	.31†	.19	1.37	.27	.20	1.31	.16	.22	1.18
Sibling Intimacy	.02	.40	1.03	.19	.41	1.21	.26	.43	1.30
Sibling Negativity	.14	.29	1.15	.14	.29	1.15	.23	.32	1.26
Parental Knowledge	-1.03**	.39	.36	-1.08**	.40	.34	-1.04*	.42	.36
Shared Friends (Shr Fr)	.14	.22	1.15	.41	.37	1.50	-.34	.43	.71
Sib Modeling (Mod)	-.13	.30	.88	-1.45*	.59	.23	-1.49†	.67	.23
Sib Alc X Mod				1.64**	.63	5.15	1.73*	.71	5.63
Sib Alc X Shr Fr				-.29	.45	.75	.53	.51	1.70
Mod X Shr Fr				.35	.27	1.42	-2.23**	.86	.11
Mod X Sib Alc X Shr Fr							3.38***	.97	29.40
χ^2		107.81			116.18*			133.95***	
<i>df</i>		13			16			17	

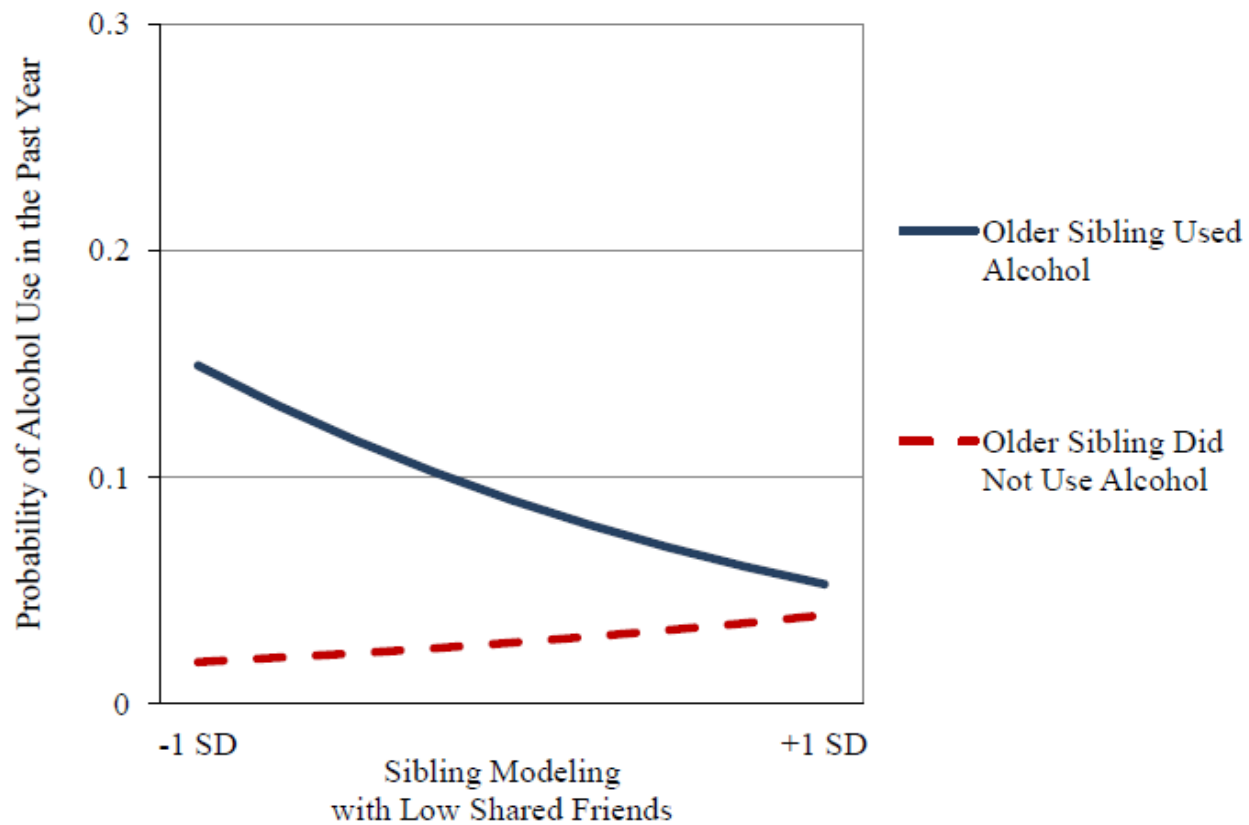
Note: Non-significant controls omitted from table: parent education, age spacing and gender. OR = Odds Ratio

†*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

Results: Alcohol Use



Results: Alcohol Use



Results: Cigarette Use

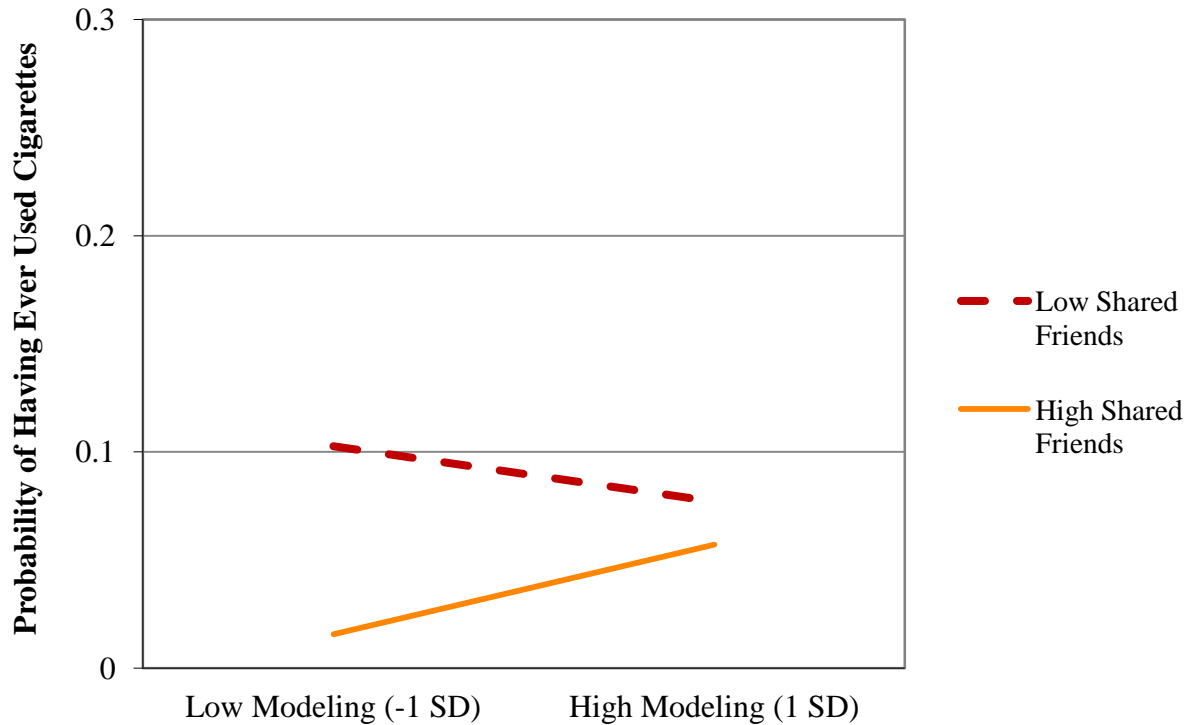
Table 2
Summary of Logistic Regression Analysis for Variables Predicting Younger Siblings' Cigarette Use (N=322)

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	<i>OR</i>	<i>B</i>	<i>SE B</i>	<i>OR</i>
Intercept	-2.72***	.41		-2.90***	.43	
Family Structure	1.05**	.38	2.87	1.10**	.39	2.99
Gender Composition	-.01	.38	.98	-.01	.39	1.00
Friends' Cigarette Use	.80***	.15	2.22	.82***	.15	2.26
Sib's Cigarette Use (Sib Cig)	.73†	.38	2.08	.84*	.41	2.31
Parent's Cigarette Use	.47	.47	1.60	.36	.49	1.43
Sib Intimacy	.29	.43	1.34	.29	.44	1.34
Sib Conflict	-.02	.38	.98	.01	.30	1.01
Parental Knowledge	-.97**	.37	.38	-.99**	.38	.37
Shared Friends	-.45†	.26	.64	-.63†	.35	.54
Sib Modeling	-.16	.32	.85	.36	.44	1.44
Sib Cig X Sib Modeling				-.68	.55	.51
Sib Cig X Shared Friends				.37	.50	1.45
Sib Modeling X Shared Friends				.64*	.30	1.89
χ^2		74.27			79.27	
<i>df</i>		13			16	

Note: Non-significant controls omitted from table: parent education, age spacing and gender. OR = Odds Ratio

†*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

Results: Cigarette Use



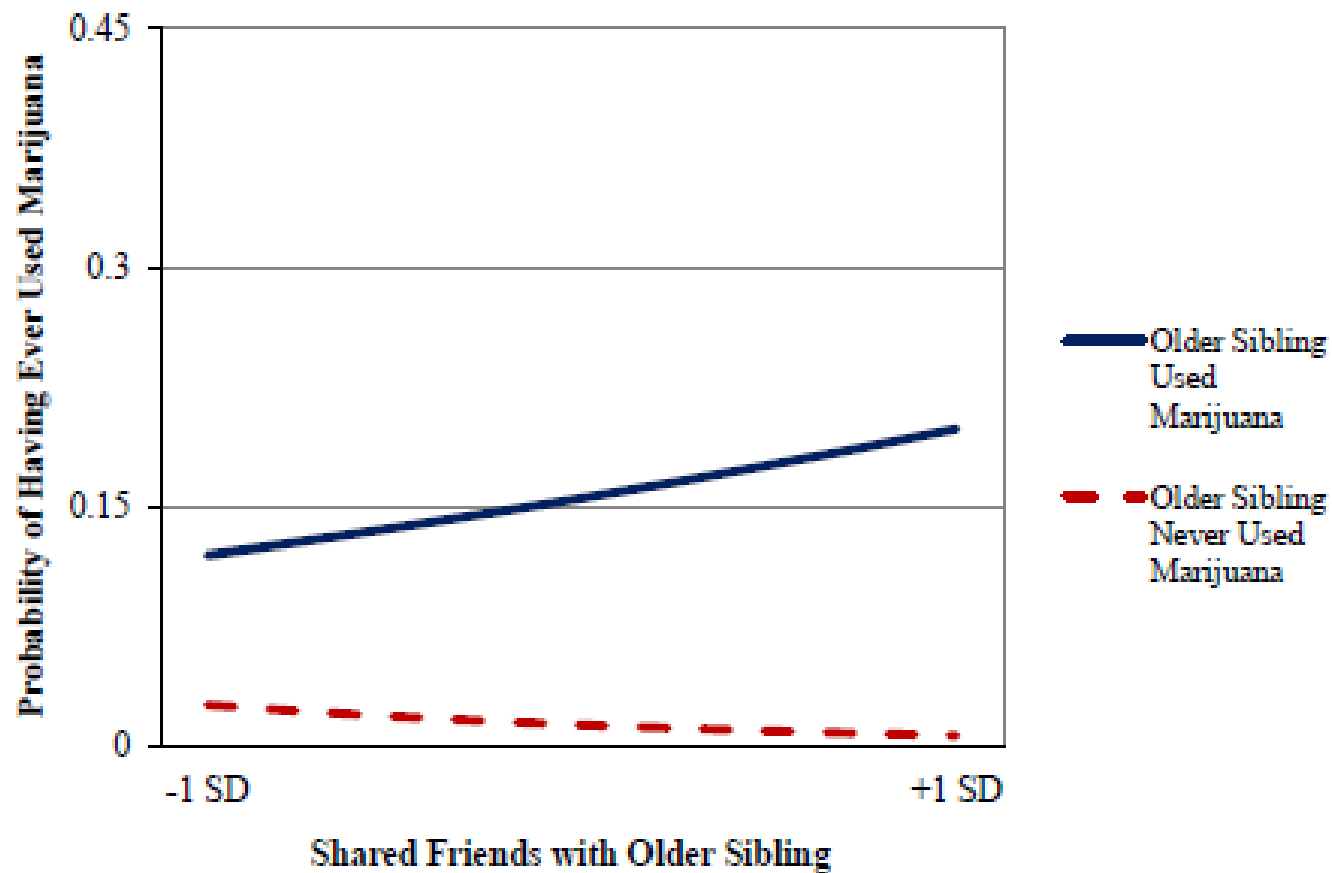
Results: Marijuana Use

Table 3
Summary of Logistic Regression Analysis for Variables Predicting Younger Siblings' Marijuana Use (N=322)

Variable	Model 1			Model 2		
	B	SE B	OR	B	SE B	OR
Intercept	-3.86***	.56		-4.27***	.64	
Family Structure	.81†	.43	2.25	.94*	.45	2.55
Gender Composition	.01	.43	1.01	.12	.44	1.12
Friends' Cig Use	.86***	.16	2.37	.91***	.17	2.47
Sib's Marijuana Use (Sib Marij)	2.15***	.48	8.62	2.58***	.56	13.24
Parent's Cig Use	.29	.54	1.33	.19	.55	1.21
Sib Intimacy	.29	.47	1.33	.22	.48	1.25
Sib Conflict	.52	.36	1.68	.56	.36	1.75
Parental Knowledge	-.78†	.43	.46	-.80†	.44	.45
Shared Friends	-.28	.29	.76	-.73	.50	.48
Sib Modeling	-.12	.36	.89	-.15	.62	.86
Sib Marij X Sib Modeling				.28	.71	1.32
Sib Marij X Shared Friends				.64†	.36	1.89
Sib Modeling X Shared Friends				1.06†	.60	2.87
χ^2		88.19			96.47*	
df		13			16	

Note: Non-significant controls omitted from table: parent education, age spacing and gender. OR = Odds Ratio
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Results: Marijuana Use



Discussion

- Older siblings' substance use was strongly related to younger siblings' use
 - For alcohol, sibling effects were greater than effects of both peers and parents
 - Modeling predicted similarities in alcohol use net of variables used as proxies for social learning in the past
 - Sibling conflict did not predict substance use
 - Sibling similarities in alcohol use were greatest when youth modeled and shared friends

Discussion

- Low modeling: Evidence for sibling differentiation?
- Modeling and peer network effects were more robust for alcohol.

Acknowledgements

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