Genetic Similar among Best Adolescent Friends (rough draft)

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Hypothesis. Empirically, two sets of well-established findings suggest the hypothesis of a genetic similarity among close friends, at least with respect to certain attitudes, traits, and behaviors: (1) friends share certain attitudes, traits and behaviors (e.g., Bearman & Bruckner, 2000; Berelson et al., 1954; Duncan et al., 1972; Matsueda, 1982; Matsueda & Heimer, 1987); (2) many of these attitudes, traits, and behaviors have been shown to be partially genetic (e.g., Plomin et al., 2003; Plomin et al., 2001; Rodgers et al., 1999). These findings point to the possibility of a genetic similarity among best friends because they are similar in certain characteristics and because the source of the similarity is partially genetic.

Friend Selection. Earlier psychological literature often considered social or peer pressure the primary process of influence between friends. Bronfenbrenner (1967, 1970) argued that peers can change children's behavior because they put pressure on them. Later work has demonstrated a whole spectrum of influence mechanisms from coercive pressure at one extreme to something very close to a reasoned debate at the other extreme (Bandura, 1977; Berndt, 1999; Dishion et al., 1999; Dishion et al., 2001; Hartup, 1983; Piaget, 1932/1965). Most researchers acknowledge that not all the similarity among friends is due to friend influence (second interpretation). Two individuals may become friends because they are similar in some characteristics to each other (see review by Berndt et al., 2002; Kandel, 1978). Scarr and McCartney (1983) argued that children are not only influenced by environment, they also actively participate in the creation of their own environment. Children tend to seek the right environment that matches their own genetic propensities. Friends and peers are a natural part of an adolescent's environment. Part of the similarity between friends may thus be due to selection rather than influence. Researchers generally use the term 'selection' to describe all processes, conscious or not, in which individuals similar in certain characteristics become friends (Berndt et al., 2002). Sociological (Bearman & Bruckner, 2000; Kandel, 1978) and

epidemiological (Bauman & Ennett, 1996) literature also refer to this as an issue of friends versus selection effects.

Evidence for our hypothesis will have implications for the debate of friends versus selection effects. If best friends are, indeed, to some extent, genetically similar, it would suggest a genetic role in friendship selection and formation even though our data can't inform on the mechanisms of the selection and formation.

Data and Measures. Our project draws data from Add Health Waves I-II. At both Waves I and II, Add Health respondents were asked to nominated friends. Saliva DNA was collected among these Add Health respondents at Wave III and subsequently, a genotyping project was carried with support from the National Science Foundation that measured 1536 SNPs for each individual. Excluding missing and ancestral informative markers, we were left with about 1,000 SNPs to analyze.

Preliminary Findings. The enclosed table describes our preliminary findings. We calculate the correlation of each SNP between friend pairs. For each SNP we also calculated the correlation between pairs chosen randomly from the same dataset for comparison. For quality control, we calculated the correction of the SNPs between MZ twins, DZ twins and full siblings. These known relatives are correlated as expected. The table shows only the top ten SNPs from the ranking by the size of the correlation coefficient.

Preliminary Conclusions. Best friends among adolescents in the United States do appear to share some genes although this sharing seems to be limited only to certain locations and the sharing also appears to be moderate in strength.

		wave I or II reciprocal friends (N=256)			stable friends (N=242)			wave I nominated friends (N=694)		
Gene	SNP	rho	ProbZ	p	rho	ProbZ	p	rho	ProbZ	p
ALDH2	rs2158029	0.41654	<.0001	0	0.4918	<.0001	0	0.1017	0.0302	0.05853
ALDH2	rs10849970	0.3124	0.0004	0.00016	0.431	<.0001	0	0	.	1
ADCY3	rs17046666	0.23736	0.0046	0.00553	0	.	1	0.01741	0.3732	0.74889
COMT	rs174697	0.236	0.005	0.00583	0.2093	0.0135	0.02007	0.07212	0.0967	0.18628
CCKBR	rs7951875	0.2308	0.0057	0.00711	0.232	0.0078	0.00942	0.09295	0.0445	0.08754
OPCML	rs7129438	0.22457	0.0078	0.00897	0.2264	0.0076	0.00981	0.04059	0.226	0.4497
TCF7L2	rs2094405	0.21792	0.0098	0.0114	0.1106	0.114	0.22261	0.03023	0.2871	0.57376
OPCML	rs4937752	0.19707	0.0164	0.02302	0.0725	0.2143	0.42453	0.13042	0.0083	0.01396
OPCML	rs7935421	0.19153	0.0173	0.02741	0.1516	0.0498	0.09056	0.04612	0.1958	0.39028
TBC1D7	rs2496130	0.19043	0.0178	0.02836	0.0352	0.3507	0.70146	0.02556	0.318	0.63633

		wave I or II reciprocal friends (N=256)			random pairs (N=1000)			MZ(N pairs=256)	DZ(N pairs=104)	FS(N pairs=743)
Gene	SNP	rho	ProbZ	p	rho_Mean	p_Mean	prob_Mean	Rho	Rho	rho
ALDH2	rs2158029	0.41654	<.0001	0	0.0018149	0.954837	0.419847	0.59643	1	0.7003
ALDH2	rs10849970	0.3124	0.0004	0.00016	0.0031488	0.921675	0.430443	0.64967	1	0.70526
ADCY3	rs17046666	0.23736	0.0046	0.00553	0.019463	0.714707	0.190092	0.48275	1	0.48803
COMT	rs174697	0.236	0.005	0.00583	0.0298082	0.483565	0.141924	0.47831	1	0.56776
CCKBR	rs7951875	0.2308	0.0057	0.00711	0.0024045	0.940769	0.394547	0.4919	1	0.48666
OPCML	rs7129438	0.22457	0.0078	0.00897	0.025192	0.565336	0.198255	0.48073	1	0.54682
TCF7L2	rs2094405	0.21792	0.0098	0.0114	0.006684	0.858061	0.228383	0.63311	1	0.50668
OPCML	rs4937752	0.19707	0.0164	0.02302	0.0273615	0.551493	0.187231	0.509	1	0.47195
OPCML	rs7935421	0.19153	0.0173	0.02741	0.0342151	0.618342	0.061101	0.50332	1	0.47684
TBC1D7	rs2496130	0.19043	0.0178	0.02836	0.0183064	0.589276	0.308088	0.43885	1	0.578