

## Supplemental Information

### Michigan Longitudinal Study Measures

**Drinking and Drug History Form.** This questionnaire incorporates items from an earlier National Institute on Drug Abuse national survey, Veterans Affairs questionnaires, and the University of Michigan Monitoring the Future survey (1-3). The measure has items assessing past year consumption levels of alcohol, frequency, and duration of a variety of alcohol problem indicators, frequency of other drug use, and troubles related to the use of substances. These data were collected as part of the ongoing Michigan Longitudinal Study (MLS), and are therefore not contemporaneous with the imaging data. On average, these data were collected within 7 months (mean  $\pm$  SD = 0.62  $\pm$  0.61 years) of the scanning session. Data for 7 of the participants were collected over 1 year before the scan and these were distributed equally across all three groups. There were no differences between groups in the amount of time between drinking and drug history (DDHx) data collection and fMRI data collection ( $p > .8$ ).

The alcohol problem score was the number of different drinking-related problems out of a possible 37 ever reported by the subject since the age of 11 (total sample mean  $\pm$  SD: 4.9  $\pm$  5.7). Specific items endorsed are included in the table below. “Problem” alcohol involvement was defined as a score above the mean for the entire sample. Participants were asked how many days a month they have had a drink for the past 6 months and the 6 months previous. They were also asked about the amount they usually drank on a drinking day. Drinking quantity was calculated by summing drinking days and multiplying by usual number of drinks per day. Participants were asked on how many occasions they have used marijuana or hashish in the past 12 months and this amount was used as an estimate of their frequency of marijuana smoking. In

addition, the number of different illicit drugs participants ever reported using over the assessment period was used to quantify illicit drug use.

**Table S1.** Alcohol problems from the Drinking and Drug History Form

<b>Alcohol Problem</b>	<b>%</b>
Once started drinking, kept on going till drunk	29.9
Thought I was drinking too much	16.9
Felt guilty about my drinking	16.4
Had days where I drank much more than I expected to when I began	15.3
Had blackouts	14.7
Gotten in trouble with my parents because of my drinking	13.6
Found that I tended to gulp my drinks rather than just drink them	13.6
Found that I was able to drink a lot more than I used to before I would get drunk	10.7
Got into difficulties of any kind with my friends because of my drinking	10.2
Restricted my drinking to certain times of day or week in order to control it	8.5
Driven a car when I'd had a good bit to drink	7.9
Been criticized by someone I was dating because of my drinking	6.8
Needed to drink a lot more in order to get an effect	6.2
Gone on a binge of constant drinking	5.6
Had the shakes till the morning after	5.6
Took a drink or two first thing in the morning	5.1
Gotten in trouble with the police because of my drinking	4.0
Been given a ticket for public intoxication, drunk and disorderly or other	4.0
Found that I had a strong need for a drink at some time each day	4.0
Found that I often continued drinking for more days in a row than I had planned to	4.0
Kept on drinking after I promised myself not to	3.4
My spouse or others in my family (parents or children) objected to my drinking	2.8
Missed school (or time on job) because of my drinking	2.3
Lost friends because of my drinking	2.3
Heard or saw or felt things that weren't there several days after drinking	1.7
Been arrested for a drinking related offense	1.7
Had to go to a hospital because of my drinking	1.1
Had to stay in a hospital overnight because of my drinking	1.1
Been put on probation or parole for a drinking related offense	1.1
Been court ordered to get alcohol treatment	0.6

% refers to percentage of entire sample who endorsed each problem.

**Youth Self Report.** Behavior problems were assessed with the Youth Self-Report (YSR) (4) as part of the ongoing MLS. Self report was used because it has greater validity than parent or teacher reports for externalizing behavior and drug use (5) in adolescence and thereafter. The YSR yields scores on eight narrow band and two broad band subscales (externalizing and internalizing behavior) and was completed by each participant when they were between 15 and 17 years old, as part of the MLS assessments conducted every three years. On average, across the whole group, the YSR was completed 2.8 ( $\pm$  1.5) years before the scanning session. There were no differences between groups in the amount of time between YSR data collection and fMRI data collection ( $p > .4$ ). Furthermore, externalizing and internalizing problem behavior has been found in a number of studies to be stable through adolescence (6-9) suggesting that the data used is a reliable indicator of externalizing problems at time of scanning. YSR T-scores for all subscales are included in the table, below.

**Table S2.** YSR T-Scores for all subscales by group

	FH-	FH+ Control	FH+ Problem
Withdrawn	53(5.5)	52(6.3)	54(5.1)
Somatic Complaints	54(6.0)	52(4.1)	53(4.4)
Social Problems	52(4.9)	52(4.7)	52(3.6)
Anxious/depressed	52(3.8)	53(7.1)	53(4.9)
Thought Problems	52(3.9)	51(3.2)	53(7.5)
Attention Problems	53(4.6)	53(6.1)	54(4.9)
Delinquent Behavior	52(3.6)	55(8.3)	63(9.7)
Aggressive Behavior	52(3.2)	53(6.9)	55(7.9)
Total Internalizing	44(12.8)	43(12.1)	49(7.8)
Total Externalizing	46(8.7)	49(12.6)	57(9.7)

FH, family history

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