

# Using Adapted Short MASTs for Assessing Parental Alcoholism: Reliability and Validity

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In previous research adapted versions of the Short Michigan Alcoholism Screening Test (SMAST) have been employed to assess an individual's father's (F-SMAST) and mother's alcohol abuse (M-SMAST). However, to date psychometric information on these forms has been limited. In order to more broadly assess the psychometric properties of these forms, several critical issues in five related studies were addressed. The samples for the five studies were drawn from a college population at a large midwestern university. Overall, the reliability and validity of the adapted SMASTs appears to be quite good. The F-SMAST demonstrated high reliability (from the standpoint of internal consistency, temporal stability, and reliability across siblings) as well as validity (both in respect to convergence with an interview measure and with father's own report on a parallel instrument). Furthermore, shortening both of these instruments to nine-item versions appears to improve their reliability and validity. For researchers and clinicians interested in assessing parental history of alcoholism, the F-SMAST and M-SMAST would appear to be a reliable and valid paper-and-pencil measure.

**Key Words:** SMAST, Reliability, Validity, Children of Alcoholics, Family History Method.

IN RECENT YEARS, there has been considerable interest in identifying children of alcoholics (COAs) for both clinical and research purposes.<sup>1</sup> To date, two major approaches to identifying COAs has been employed. In some studies COAs have been directly identified by contacting the relatives of diagnosed alcoholics in treatment or community samples; in other studies, COAs are self-identified on the basis of their responses to family history interviews or self-report questionnaires. Despite a proliferation of a variety of paper-and-pencil, self-report techniques for identifying COAs (e.g., the Children of Alcoholics Screening Test [CAST],<sup>2</sup> the Family Tree Questionnaire<sup>3</sup>) and their widespread use, to date no single one of these instruments has been evaluated extensively with respect to both reliability and validity.

In the studies reported below, we investigate both the reliability and validity of one self-report technique, Sher and Descutner's<sup>4</sup> adaptations of the 13-item Short Michigan Alcoholism Screening Test (SMAST)<sup>5</sup> for assessing father's alcoholism (F-SMAST) and mother's alcoholism (M-SMAST). In the F-SMAST and M-SMAST, SMAST

items are reworded to refer to fathers' and mothers' drinking, respectively.

In order to assess reliability, internal consistency, temporal stability, and inter-rater agreement were all evaluated. In order to assess validity, F- and M-SMAST agreement with an established self-report, interview-based measure of family history (the Family History—Research Diagnostic Criteria interview) and with parents' own reports on the SMAST were computed. This multifaceted evaluation strategy yields a comprehensive picture of the psychometric properties of the F- and M-SMAST.

## STUDY 1: INTERNAL CONSISTENCY

### Subjects

Approximately 80% ( $N = 3156$ ) of first-time college freshmen ( $N = 3944$ ) from a large, midwestern, state university participated in the initial screening phase of a 4-year longitudinal study on the development of drinking patterns and problems. These subjects were contacted through mailings, classes, and phone contacts and scheduled to complete the screening battery during supervised sessions held in dormitories, fraternities and sororities, classrooms, and project offices. Subjects who missed their appointment were rescheduled until they either stated their desire not to participate or completed the screening battery. Subjects were not screened until they had reached their 18th birthday ( $M = 18.27$  years  $SD = 0.90$ ); 49.5% were male and 84.6% were Caucasian. The individuals who completed the screening questionnaire make up the initial sample from which subjects for Studies 1, 3, 4, and 5 were drawn.

### Procedure

As part of the screening questionnaire, subjects completed the F-SMAST and M-SMAST, each followed by a single item assessing the corresponding parent's history of alcoholism (i.e., "Do you think your father/mother is or was an alcoholic?") in a proctored testing environment.

In this, and in the studies to follow, all questions were referenced to *biological* parents. Subjects who could not make informed judgments on a biological parent's drinking behavior due to a lack of valid information (as was sometimes the case with adopted subjects) were instructed to leave those items blank and the data were coded as missing.

In addition to the items concerning parental drinking, subjects completed scales concerning their own substance use, personality traits, and several health-related behaviors. These other questionnaire items are not the focus of the current investigation and are not discussed further.

## RESULTS

The internal consistency of the F- and M-SMAST was assessed using coefficient alpha. The alpha coefficient obtained for the F-SMAST was quite high (0.87), indicating excellent internal consistency. While the alpha for the

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*Received for publication July 9, 1991; accepted December 27, 1991*

*This research was supported, in part, by research grant 1R01 AA7231 from the National Institute on Alcohol Abuse and Alcoholism to the second author.*

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M-SMAST was somewhat lower (0.74), it was still quite acceptable. Examination of item-total correlations for both the F-SMAST and the M-SMAST did not suggest that any items should be dropped.

## STUDY 2: TEST-RETEST STABILITY

### *Subjects*

Subjects ( $N = 318$ ; 150 males, 164 females, four did not provide gender information) were recruited from introductory psychology courses, ostensibly for a study of personality and family background. In exchange for their participation, subjects received credit toward an introductory psychology course requirement.

### *Procedure*

Subjects completed the F-SMAST and M-SMAST and the single item assessing the corresponding parent's history of alcoholism twice over a 10-day to 3-week test-retest interval ( $M = 16.03$  days,  $SD = 2.77$ ) in a proctored, group testing environment. In addition, all subjects completed a personality questionnaire (the Tridimensional Personality Questionnaire),<sup>6</sup> not the focus of the present study.

## RESULTS

### *General Strategy*

In the following studies, reliability and validity coefficients for categorical data (e.g., the adapted SMAST items, global judgment items and the dichotomies based on various cut-scores) were calculated by computing kappa<sup>7</sup> and Yule's  $Y$ .<sup>8</sup> ( $Y$ , a statistic similar to kappa, exhibits less variance over different base rates as compared to kappa and, presumably, has greater generalizability to other samples). Pseudo-Bayesian estimators were used to estimate 0-cell frequencies for calculations of  $Y$  when necessary.<sup>8,9</sup> Product-moment and intraclass correlation coefficients (ICCs)<sup>10</sup> were employed to examine agreement with the F-SMAST and M-SMAST when treated as continuous measures.

### *Paternal Drinking Problems*

Tables 1 and 2 present data on the temporal stability of F-SMAST and the individual items comprising the scale. Overall, agreement over time appeared to be excellent for most items. The ICC and Pearson correlation coefficients for the total scale score were both 0.94 ( $p < 0.0001$ ).

Table 2 presents levels of test-retest agreement on paternal alcoholism with the implementation of different cut-scores on the F-SMAST. The most satisfactory levels of test-retest agreement were found with a cut score of 5 ( $\kappa = 0.86$ ,  $Y = 0.89$ ).

### *Maternal Drinking Problems*

The results of the analyses on the temporal stability of the M-SMAST are also presented in Tables 1 and 2. Although most items appeared quite stable, reversed items (items 1, 4, and 5) appeared to exhibit lower stability

relative to the other items of the scale. The ICC and Pearson correlation coefficients for the total scale score were 0.85 ( $p < 0.0001$ ) and 0.84 ( $p < 0.0001$ ), respectively. Table 2 illustrates that the most satisfactory level of test-retest agreement on the M-SMAST can be found with a cut score of 5 ( $\kappa = 1.00$ ,  $Y = 1.00$ ).

## STUDY 3: INTERSIBLING AGREEMENT FOR PARENTAL ALCOHOLISM

### *Subjects*

Participants in the initial screening ( $N = 3156$ , see description of Study 1 subjects) were asked to provide the names, addresses and telephone numbers of siblings in the surrounding area ( $n = 366$ ). This information was gathered on a consent form administered during the initial screening with an option to the subject as to whether the project could contact his/her siblings in the area. If consent was provided by the subject ( $n = 349$ ), attempts were made to contact the identified siblings by telephone and they were asked to participate in a study on drinking behavior. Subjects who agreed to participate were then scheduled for an appointment to complete the same questionnaire as their freshman siblings ( $n = 104$  sibling pairs). Subjects either were paid \$5.00 or, if eligible, received credit toward an introductory psychology requirement for their participation.

Additional sibling pairs were identified through the UMC student telephone directory. Individuals sharing the same last name and same permanent address were considered potential siblings and were contacted by telephone. After verifying that the two individuals were siblings, each was then asked to participate in the study. Those sibling pairs who agreed to participate ( $n = 24$ ) either received \$5.00 per individual or credit toward a psychology course requirement (if eligible). The final sample also includes subjects ( $n = 88$ ) who previously participated in a similar study conducted by Sher and Descutner<sup>4</sup> in the same laboratory. (Although data on the F-SMAST has been previously reported,<sup>4</sup> M-SMAST data from this particular study were not previously reported. Furthermore, the larger sample size, which results from combining these samples, allows for a more accurate estimate of intersibling agreement for both the M-SMAST and F-SMAST.) In the earlier study sibling pairs were identified through the telephone directory and asked if they would be willing to complete a brief questionnaire. Consenting subjects were then brought into the laboratory and asked to complete adapted versions of the F-SMAST and M-SMAST with a proctor present. The resulting sample, composed of the three subsamples, contains data on 216 sibling pairs (25% male-male, 34% female-female, and 41% male-female).

## RESULTS

### *Paternal Drinking Problems*

Data on sib-sib agreement for fathers' drinking problems are presented in Tables 3 and 4. Overall, agreement appeared to be in the moderate to excellent range for most items. A few items resulted in relatively lower kappas and  $Y$ s. These items were generally either reverse scored (items 1, 4, and 5) or required the sibling to be aware of the father's relations with others (items 2 and 7) or privy to some legal difficulty incurred due to a drinking problem (items 12 and 13).

In addition, cut-score analyses of intersibling agreement for paternal alcoholism indicate the most satisfactory levels of intersibling reliability are obtained with a cut score of 5 ( $\kappa = 0.79$ ,  $Y = 0.87$ ). Reliability remains fairly stable

**Table 1.** Test-Retest Agreement on Parental Problem Drinking

Item	F-SMAST					M-SMAST				
	Yes at time 1 & time 2	No at time 1 & time 2	Time 1 $\neq$ time 2	Kappa	Y	Yes at time 1 & time 2	No at time 1 & time 2	Time 1 $\neq$ time 2	Kappa	Y
Do you think you (mother/father) is/was an alcoholic?	31	244	7	0.88*	0.93*	9	271	0	1.00*	0.96*
1. Do you feel your (mother/father) has been a normal drinker? <sup>†</sup>	226	44	13	0.84*	0.89*	250	18	16	0.66*	0.80*
2. Did you mother/father, grandparent, or other near relative ever complain about your (mother's/father's) drinking?	57	212	11	0.87*	0.89*	13	262	8	0.75*	0.88*
3. Did your (mother/father) ever feel guilty about her/his drinking?	29	224	28	0.62*	0.71*	13	254	15	0.61*	0.77*
4. Did friends and relatives think your (mother/father) was a normal drinker? <sup>†</sup>	236	29	16	0.75*	0.84*	238	17	28	0.49*	0.66*
5. Was your (mother/father) able to stop drinking when she/he wanted to? <sup>†</sup>	254	17	11	0.73*	0.85*	239	12	31	0.38*	0.68*
6. Has your (mother/father) ever attended a meeting of Alcoholics Anonymous?	13	260	8	0.75*	0.89*	6	271	5	0.70*	0.91*
7. Has your (mother's/father's) drinking ever created problems between her/him and your father/mother (or step-parent) or another near relative?	44	223	15	0.82*	0.86*	12	264	5	0.82*	0.93*
8. Has your (mother/father) ever gotten into trouble at work because of drinking?	13	265	3	0.89*	0.95*	1	281	0	1.00*	0.95*
9. Has your (mother/father) ever neglected her/his obligations, family, or work for two or more days in a row because she/he was drinking?	12	262	6	0.79*	0.90*	2	276	3	0.57*	0.89*
10. Has your (mother/father) ever gone to anyone for help about her/his drinking?	13	264	4	0.86*	0.94*	5	276	0	1.00*	0.97*
11. Has your (mother/father) ever been in a hospital because of drinking?	5	270	5	0.66*	0.88*	0	278	3	0.00	
12. Has your (mother/father) ever been arrested for drunken driving, driving while intoxicated, or driving under the influence of alcoholic beverages?	18	259	3	0.92*	0.96*	0	279	2	0.00	
13. Has your (mother/father) ever been arrested, even for a few hours, because of other drunken behavior?	12	263	6	0.79*	0.90*	1	280	0	1.00*	0.95*

\*  $p < 0.0001$ .<sup>†</sup> Reverse scored item.**Table 2.** Test-Retest Reliability Statistics for Various Cut Scores

Criterion score	F-SMAST					M-SMAST				
	Agree alcoholic	Agree non-alcoholic	Disagree	Kappa	Y	Agree alcoholic	Agree non-alcoholic	Disagree	Kappa	Y
$\geq 1$	82	170	28	0.78*	0.80*	45	187	49	0.53*	0.58*
$\geq 2$	58	207	15	0.85*	0.90*	24	230	27	0.58*	0.71*
$\geq 3$	42	226	12	0.85*	0.86*	14	260	7	0.79*	0.86*
$\geq 4$	32	237	11	0.83*	0.85*	9	271	1	0.95*	0.96*
$\geq 5$	25	248	7	0.86*	0.89*	9	272	0	1.00*	1.00*
$\geq 6$	18	253	9	0.78*	0.89*	4	272	5	0.60*	0.86*
$\geq 7$	15	259	6	0.82*	0.91*	1	276	4	0.33*	0.81*
$\geq 8$	12	262	6	0.79*	0.90*	0	279	2	0.00	
$\geq 9$	10	266	4	0.83*	0.94*	0	281	0	0.00	
Intraclass correlation coefficient for total score			0.94*					0.85*		
Pearson correlation coefficient for total score			0.94*					0.84*		

\*  $p < 0.0001$ .

with the implementation of higher cut-scores; however, with this increase the yield of identified positives decreased somewhat.

The statistical model for comparing intersibling agreement for the full scale adapted SMAST score considers raters (i.e., siblings) as nested within targets (parents).<sup>7,10,11</sup> Intraclass correlation coefficients computed for F-SMAST score agreement based on the above model indicated excellent intersibling reliability. The resulting F-SMAST ICC was 0.86 ( $p < 0.0001$ ).

### Maternal Drinking Problems

Data on sib-sib agreement for mothers' drinking problems are also presented in Tables 3 and 4. Although low base rates for maternal alcoholism precluded the ability to estimate the kappas and Ys for five of the items, good agreement was found for most items. Once again, those items which were either reverse scored or required a subjective judgment exhibited lower estimates of agreement.

**Table 3.** Sib-Sib Agreement on Parental Problem Drinking

Item	F-SMAST					M-SMAST				
	Number of sibling pairs who:					Number of sibling pairs who:				
	Agree		Disagree	Kappa	Y	Agree		Disagree	Kappa	Y
	Yes	No				Yes	No			
Do you think your mother/father is/ was an alcoholic?	19	185	9	0.79**	0.88**	2	210	2	0.66**	0.91**
Item 1 (reverse scored)	167	21	26	0.55**	0.60**	184	7	23	0.32**	0.53**
Item 2	34	160	20	0.71**	0.76**	4	199	11	0.39**	0.67**
Item 3	20	165	27	0.52**	0.65**	2	194	17	0.15*	0.40*
Item 4 (reverse scored)	172	13	28	0.41**	0.57**	156	8	49	0.11	0.19
Item 5 (reverse scored)	185	15	14	0.65**	0.77**	179	6	28	0.23**	0.40**
Item 6	9	193	10	0.62**	0.86**	5	197	12	0.42**	0.68**
Item 7	28	163	23	0.64**	0.72**	4	203	5	0.60**	0.84**
Item 8	7	198	6	0.69**	0.86**	0	213	0		
Item 9	9	198	7	0.70**	0.89**	0	212	0		
Item 10	9	201	2	0.90**	0.94**	2	210	1	0.80**	0.90**
Item 11	8	199	6	0.71**	0.88**	0	213	0		
Item 12	6	199	7	0.61**	0.83**	0	212	1	0.00	
Item 13	2	207	4	0.49**	0.76**	0	213	0		
Intraclass correlation on total score				0.86**					0.52**	

Item content corresponding to item number can be found in Table 1.

\* $p < 0.01$ .

\*\* $p < 0.0001$ .

**Table 4.** Sib-Sib Agreement for the Implementation of Various Cut Scores

Criterion score	F-SMAST					M-SMAST				
	Agree alcoholic	Agree Non- alcoholic	Disagree	Kappa	Y	Agree alcoholic	Agree Non- alcoholic	Disagree	Kappa	Y
$\geq 1$	52	118	45	0.54**	0.56**	22	122	71	0.16*	0.20*
$\geq 2$	33	144	38	0.52**	0.57**	10	168	37	0.25**	0.38**
$\geq 3$	23	170	22	0.62**	0.70**	5	196	14	0.38**	0.65**
$\geq 4$	19	184	12	0.73**	0.82**	3	207	5	0.53**	0.85**
$\geq 5$	17	190	8	0.79**	0.87**	3	211	1	0.85**	0.92**
$\geq 6$	12	196	7	0.76**	0.87**	3	211	1	0.85**	0.92**
$\geq 7$	10	199	6	0.75**	0.88**	0	212	3	0.00	
$\geq 8$	9	202	4	0.81**	0.91**	0	213	2	0.00	
$\geq 9$	8	205	2	0.88**	0.94**	0	215	0		

\* $p < 0.01$ .

\*\* $p < 0.0001$ .

Cut-score analyses indicated that the most satisfactory level of intersibling reliability was obtained with a cut score of 5 on the M-SMAST ( $\kappa = 0.85$ ,  $Y = 0.92$ ). Examination of overall scale agreement, using the model discussed in the previous section, revealed a M-SMAST ICC of 0.52 ( $p < 0.0001$ ).

#### *Age and Gender Differences in Rating Parental Alcoholism.*

Although most previous work has not addressed the possibility of gender differences in the reporting of parental problem drinking, we felt it important to determine whether gender-related rating biases existed in our data. In order to evaluate this, responses from brothers and sisters in opposite-sex sib pairs were compared. Two methods were used in these comparisons: (1) nonparametric sign tests (comparing brothers and sister's responses) were computed for individual items, and (2) paired  $t$  tests were used to compare brother/sister differences on the total adapted SMAST scales. None of the 28 sign tests, both for the individual SMAST items and global items were signif-

icant, nor were the two paired  $t$  tests. Thus, no evidence was found to indicate systematic gender differences exist in reporting.

Paired  $t$  tests were used to compare the effect of sibling age on the total adapted SMAST scales. All sibling pairs that included individuals of the same age ( $n = 13$ ) were dropped from these analyses resulting in a sample of 203 sibling pairs. A significant difference was found for the M-SMAST ( $t(202) = 2.37$ ,  $p < 0.02$ ), such that older siblings (Age:  $M = 22.3$ ,  $SD = 4.4$ ; M-SMAST:  $M = 0.44$ ,  $SD = 1.07$ ) reported fewer maternal drinking problems than did younger siblings (Age:  $M = 18.9$ ,  $SD = 1.1$ ; M-SMAST:  $M = 0.63$ ,  $SD = 1.24$ ). No significant differences for sibling age were found for the F-SMAST.

#### **STUDY 4: CONCURRENT VALIDITY BETWEEN THE F- AND M-SMASTs AND FH-RDC INTERVIEW DIAGNOSES FOR PARENTAL ALCOHOLISM**

##### *Subjects*

Subjects who had participated in the initial screening, and met qualifications discussed below, were contacted by telephone and asked whether they would be willing to complete an interview concerning family mem-

bers, the Family History—Research Diagnostic Criteria (FH-RDC)<sup>12</sup> interview.

Subjects included in this study were initially selected on the basis of high-risk/low-risk classifications. These classifications were based on the subject's self-report of parental drinking problems using the M-SMAST and the F-SMAST. A score of 4 or greater on the F-SMAST or the M-SMAST resulted in the subject being classified as high risk. In addition, 51 male subjects with paternal F-SMASTs of 3 were also assessed and included in this study as part of the potential high risk group. A score of 0 or 1 on both the M-SMAST and F-SMAST resulted in the subject being classified as low risk. Although the project was not interested in following subjects with only an alcoholic mother (i.e., 4 or greater on M-SMAST), these individuals were originally included for other research purposes. Of 811 subjects asked to participate in the FH-RDC interview, 778 (96%) agreed and completed the interview. (In a previous publication, based on our sample,<sup>13</sup> 775 subjects are reported to have completed the FH-RDC interview. This discrepancy is attributable to less restrictive inclusion criteria in the present study.)

### Procedure

The FH-RDC is an instrument commonly used in the diagnoses of psychopathology in family members. In the current study, the FH-RDC was used to assess alcohol abuse, drug abuse, antisocial personality, and depression in first-degree relatives 18 years or older, and alcohol abuse and drug abuse in all second-degree relatives. Only the diagnosis of alcoholism in biological parents is addressed in the analyses to follow. Approximately 75% of the interviews were conducted by telephone with the remainder face-to-face in our project offices; however, identical interviewing procedures were otherwise followed and a trained interviewer, blind to the F-SMAST and M-SMAST scores, administered the interview.

## RESULTS

Data analysis examined the relation between FH-RDC diagnoses of paternal/maternal alcoholism and F-SMAST/M-SMAST diagnoses using kappa and Y. This analysis allows for the examination of the concurrent validity of the SMAST screening criteria with another established diagnostic instrument.

Data comparing diagnoses based on FH-RDC criteria with diagnoses based on different cut scores for the F-SMAST and M-SMAST are presented in Tables 5 and 6. The kappas presented in these tables reveal that the highest agreement for paternal alcoholism occurs with the employment of a cut score of 5 on the F-SMAST. For maternal alcoholism, the most satisfactory cut score appears to be a 4. However, both the F-SMAST and M-

SMAST exhibited good agreement with the FH-RDC diagnoses.

### STUDY 5: COMPARISON OF OFFSPRINGS' SCORES ON THE F-SMAST AND M-SMAST WITH PARENTS' SCORES ON THE SMAST

#### Subjects

During the initial screening session, consent was sought to contact the subjects' parents. It was explained to the subjects that if permission was given, a brief questionnaire would be sent to their mother and/or father. It was made clear that the mailing would not contain any information the subjects had provided to the projects, and that the parents would have the option of not answering the questionnaire. Additional attempts were made to recruit subjects who initially did not provide permission to contact their parents; when these subjects returned for their one-year follow-up, permission was once again sought.

If the subject completed the FH-RDC interview (see Study 4 for a more complete description of sampling) and provided the project with permission to contact their father ( $n = 523$ , 67%) and/or mother ( $n = 598$ , 77%), the parent was mailed the questionnaire. In order to increase parental participation, three attempts were made to contact parents by mail. Of the parents mailed questionnaires, 276 (53%) of the fathers responded and 389 (65%) of the mothers responded. These less than ideal response rates need to be considered when evaluating the findings below.

#### Procedure

Each parent was sent a copy of the SMAST to complete. In order to achieve a high-level of compliance, the amount of materials were kept to a minimum. Included in the mailing was a brief one-page written description of the need for the parents' data and the confidentiality safeguards, a one-page consent form, and the one-page questionnaire (front and back). Included in the questionnaire was the SMAST and a final global question that pertained to past/present alcohol problems, preceding these items were several general health and tobacco use items. These items were added to decrease the emphasis on alcohol-related behavior. A separate business-reply envelope was included so that the materials could be returned to the project with minimal difficulty; however, no compensation was provided to the parents for their participation.

## RESULTS

### Paternal drinking problems

Tables 7 and 8 present data on the agreement between fathers' and offsprings' reports of paternal problem drinking. Offspring tended to endorse paternal drinking consequences more than their fathers did. However, it needs to

**Table 5.** Agreement between Subjects' Reported Parental FH-RDC Alcohol Abuse Diagnosis and the F-SMAST Diagnosis for Various Cut Scores

Criterion	Agree nonalcoholic	Agree alcoholic	Disagree: FH-RDC: nonalcoholic F-SMAST: alcoholic	Disagree: FH-RDC: alcoholic F-SMAST: nonalcoholic	Kappa	Y
F-SMAST $\geq 1$	368	261	142	6	0.61	0.83
F-SMAST $\geq 2$	395	257	115	10	0.67	0.81
F-SMAST $\geq 3$	401	255	109	12	0.68	0.80
F-SMAST $\geq 4$	436	241	74	26	0.73	0.76
F-SMAST $\geq 5$	470	217	40	50	0.74	0.75
F-SMAST $\geq 6$	490	186	20	81	0.69	0.76
F-SMAST $\geq 7$	501	149	9	118	0.59	0.79
F-SMAST $\geq 8$	508	110	2	157	0.45	0.86
F-SMAST $\geq 9$	509	83	1	184	0.32	0.88

All statistics significant at  $p < 0.0001$ .

**Table 6.** Agreement between Subjects' Reported Parental FH-RDC Alcohol Abuse Diagnosis and the M-SMAST Diagnosis for Various Cut Scores

Criterion	Agree		Disagree:		Kappa	Y
	nonalcoholic	alcoholic	FH-RDC: nonalcoholic M-SMAST: alcoholic	FH-RDC: alcoholic M-SMAST: nonalcoholic		
M-SMAST $\geq 1$	541	50	183	3	0.20	0.75
M-SMAST $\geq 2$	648	50	76	3	0.50	0.85
M-SMAST $\geq 3$	688	50	36	3	0.69	0.89
M-SMAST $\geq 4$	701	46	23	7	0.73	0.87
M-SMAST $\geq 5$	714	38	10	15	0.74	0.86
M-SMAST $\geq 6$	719	32	5	21	0.69	0.87
M-SMAST $\geq 7$	722	22	2	31	0.55	0.88
M-SMAST $\geq 8$	722	15	2	38	0.40	0.85
M-SMAST $\geq 9$	723	12	1	41	0.34	0.87

All statistics significant at  $p < 0.0001$ .

**Table 7.** Father-Child Agreement on Paternal Problem Drinking

Item	Agree		Disagree: father no child yes	Disagree: father yes child no	Kappa	Y
	Yes	No				
Do you think your father is/was an alcoholic? (child)						
Do you feel you ever had a problem with drinking? (father)	42	170	29	27	0.46	0.50
Item 1 (reverse scored)	149	34	44	35	0.25	0.29
Item 2	49	165	47	7	0.50	0.66
Item 3	33	176	48	10	0.39	0.55
Item 4 (reverse scored)	162	27	41	30	0.25	0.31
Item 5 (reverse scored)	196	19	15	30	0.35	0.48
Item 6	27	224	9	8	0.72	0.80
Item 7	64	165	30	9	0.66	0.72
Item 8	12	233	14	6	0.50	0.70
Item 9	13	226	22	6	0.42	0.65
Item 10	25	218	13	11	0.62	0.72
Item 11	11	245	6	4	0.67	0.83
Item 12	15	220	16	12	0.46	0.61
Item 13	6	231	16	10	0.26	0.49
Pearson's $r$		0.70				

Item content corresponding to item number may be found in Table 1.

All statistics significant at  $p < 0.0001$ .

**Table 8.** Father-Child Agreement on Paternal Problem Drinking—Cut Score Analyses

Criterion	Agree		Disagree: father no child yes	Disagree: father yes child no	Sensitivity	Specificity	Kappa	Y
	Yes	No						
F-SMAST $\geq 1$	156	58	47	8	0.88	0.77	0.53	0.66
F-SMAST $\geq 2$	166	58	37	8	0.88	0.82	0.60	0.70
F-SMAST $\geq 3$	168	58	35	8	0.88	0.83	0.62	0.71
F-SMAST $\geq 4$	170	55	33	11	0.83	0.84	0.60	0.67
F-SMAST $\geq 5$	178	47	25	19	0.71	0.88	0.57	0.62
F-SMAST $\geq 6$	184	38	19	28	0.58	0.91	0.50	0.57
F-SMAST $\geq 7$	190	32	13	34	0.48	0.94	0.47	0.58

Father 'Yes' represents a score of 3 or greater on the father's SMAST.

All statistics significant at  $p < 0.0001$ .

be emphasized that our sampling strategy for this study involved sampling extreme scores on the F-SMAST. This strategy could be expected to result in the obtained pattern of findings. Also, this pattern could be attributed to a nonresponse bias of the most affected fathers. However, we have no way of evaluating this hypothesis.

Perhaps, of greatest importance, the Pearson's  $r$  for the F-SMAST versus father's SMAST was 0.70 ( $p < 0.0001$ ), indicating very good validity against the criterion of parents' own reports. This is an important finding because direct parental reports are, although fallible, the most direct assessment of the concurrent validity of offspring reports.

Table 8 presents levels of father-child agreement on paternal alcoholism for different cut-scores on the F-SMAST (paternal alcoholism was defined as a score of 3 on the father's SMAST).<sup>5</sup> The most satisfactory levels of father-child agreement can be found with a cut score of 3. The use of increasingly higher cut-scores tends to rapidly reduce the identification of true positives with little or no increases in kappa and Y.

### Maternal Drinking Problems

Data on mother-child agreement for maternal problem drinking can be found in Tables 9 and 10. In contrast to

**Table 9.** Mother-Child Agreement on Maternal Problem Drinking

Item	Agree		Disagree: Mother no child yes	Disagree: mother yes child no	Kappa	Y
	Yes	No				
Do you think your mother is/was an alcoholic? (child)						
Do you feel you ever had a problem with drinking? (mother)	12	349	4	17	0.50*	0.77*
Item 1 (reverse scored)	271	11	67	17	0.09	0.24
Item 2	6	356	17	3	0.35*	0.73*
Item 3	12	330	20	18	0.33*	0.54*
Item 4 (reverse scored)	279	9	50	26	0.07	0.16
Item 5 (reverse scored)	336	5	8	19	0.23*	0.54*
Item 6	26	328	13	15	0.61*	0.74*
Item 7	12	354	8	7	0.59*	0.79*
Item 8	2	376	2	1	0.57*	0.90*
Item 9	3	375	3	1	0.59*	0.90*
Item 10	9	367	3	0	0.85*	0.95*
Item 11	4	375	1	2	0.72*	0.93*
Item 12	1	378	1	2	0.40*	0.86*
Item 13	0	379	3	0		
Pearson's <i>r</i>		0.63*				

Item content corresponding to item number may be found in Table 1.

\*  $p < 0.0001$ .

**Table 10.** Mother-Child Agreement on Maternal Problem Drinking—Cut Score Analyses

Criterion	Agree		Disagree: mother no child yes	Disagree: mother yes child no	Sensitivity	Specificity	Kappa	Y
	Yes	No						
M-SMAST $\geq 1$	278	15	80	7	0.68	0.78	0.12	0.46
M-SMAST $\geq 2$	333	14	25	8	0.64	0.93	0.41*	0.66*
M-SMAST $\geq 3$	344	12	14	10	0.55	0.96	0.47*	0.69*
M-SMAST $\geq 4$	347	11	11	11	0.50	0.97	0.47*	0.70*
M-SMAST $\geq 5$	352	10	6	12	0.45	0.98	0.50*	0.75*
M-SMAST $\geq 6$	354	9	4	13	0.41	0.99	0.49*	0.77*
M-SMAST $\geq 7$	357	7	1	15	0.18	1.00	0.44*	0.86*

Mother 'Yes' represents a score of 3 or greater on the father's SMAST.

\*  $p < 0.0001$ .

the data concerning father's drinking, offspring were not consistently found to over-report their mothers' drinking. In fact, on the items showing the most substantial differences in patterns of disagreement (items 1 and 4 which are reverse-scored), offspring tended to under-report their mother's drinking problems. When apparent over-reporting was found, observed differences tended to be small. Again, the patterns of over- and under-reporting should be interpreted cautiously in light of the low response rate with a potential bias against sampling the most severe alcoholic mothers.

The Pearson's  $r$  for the M-SMAST versus mother's SMAST was 0.63 ( $p < 0.0001$ ), indicating reasonably good agreement between offspring's reported maternal problem drinking and actual maternal reports.

Table 10 provides levels of mother-child agreement on maternal alcoholism (again defined as a score of 3 or greater on the mothers' SMAST) with different cut-scores for the M-SMAST. The most satisfactory levels of mother-child agreement can be found with a cut score of 4. The employment of cut scores higher than 5 results in a decrease of identified positives. If sensitivity and specificity were used in the choice of an optimum cut-score, a lower cut-score might be chosen. Sensitivity is only 50% with a cut score of 4 or greater.

## POSSIBLE SCALE REVISIONS

After examining the data from the five studies, it appeared that four items tended to be less reliable and valid. These four items included the three reverse scored items (items 1, 4, and 5) and the item pertaining to guilt associated with drinking (item 3). Additional ICCs were computed on revisions of the scale dropping items 1, 3, 4, and 5. Further analyses were conducted to assess the internal consistency of the revised scales, resulting in similar or improved coefficient alphas. Table 11 presents the results of these analyses. The data indicated that the 13-item scale

**Table 11.** Reliability and Validity Indices Obtained after Deleting Items 1, 3, 4, and 5

Study	F-SMAST	M-SMAST
Internal Consistency (alpha)		
No Items deleted	0.87	0.74
Four Items deleted	0.83	0.78
Test-retest agreement (ICC)		
No Items deleted	0.94	0.85
Four Items deleted	0.95	0.93
Intersibling agreement (ICC)		
No Items deleted	0.86	0.52
Four Items deleted	0.84	0.56
Parent-offspring agreement (Pearson's $r$ )		
No Items deleted	0.70	0.63
Four Items deleted	0.73	0.76

might be improved by dropping the suggested items and decreasing the length of each scale to nine items. Comparisons between the 13-item and nine-item versions of the F-SMAST and the M-SMAST indicated that the revised, nine-item scale demonstrated equal or superior reliability and validity indices compared to its 13-item counterpart.

The only possible exception to this generalization was the small decrease in the internal consistency of the F-SMAST after the deletion of the four items ( $\alpha = 0.87$  on total scale,  $0.83$  on revised scale). In fact, it is surprising that the internal consistency of the M-SMAST improved because dropping any single item would have decreased coefficient alpha (see Study 1, "Results"). However, it appeared that the reverse-scored items comprise, on their own, a separate subscale related to method variance; deleting these increased the homogeneity of the scale.

#### THE EFFECTIVENESS OF A SINGLE, GLOBAL ITEM FOR ASSESSING FAMILY HISTORY

In the above analyses, single items assessing global ratings of each parent's alcoholism were shown to have excellent test-retest stability (Tables 1 and 2), high inter-sibling agreement (Tables 3 and 4), and moderately high agreement with the corresponding parent's self-rating of having had "problem(s) with drinking" (Tables 7 and 9). In order to examine the psychometric properties of the single, global item further, we calculated the sensitivity, specificity, kappa, and Y against the criterion of a corresponding parent's score of 3 or more on the SMAST. For ratings of both fathers and mothers, the global item performed reasonably well (*Fathers*: sensitivity =  $0.65$ , specificity =  $0.87$ , kappa =  $0.51$ ,  $Y = 0.51$ ; *Mothers*: sensitivity =  $0.55$ , specificity =  $0.99$ , kappa =  $0.61$ ,  $Y = 0.82$ ). Assuming a cut-score of three or four on the adapted SMASTS, the global item performed more poorly than the F-SMAST for predicting fathers' alcoholism (as assessed by a cut-score of three on that parent's SMAST; see Tables 7 and 8). However, the global item predicted maternal alcoholism as effectively as the M-SMAST (on the basis of sensitivity and specificity) and showed higher levels of concordance (on the basis of kappa and Y; see Tables 9 and 10). On the basis of these data, it appears that a single item is probably a more reliable and valid assessment than is commonly believed.

#### DISCUSSION

The purpose of this project was to assess the reliability and validity of Sher and Descutner's<sup>4</sup> adaptation of the SMAST for assessing paternal (F-SMAST) and maternal (M-SMAST) alcoholism. Although a large amount of data exists on the use of the family history interview methods,<sup>12,14</sup> relatively little data are reported on the effectiveness of the "paper-and-pencil," self-report techniques for assessing family history.<sup>2,3,15</sup>

Based on the findings reported above, the reliability and validity of adapted SMASTS for assessing parental alcoholism must be considered quite good. The F-SMAST demonstrated high reliability (from the standpoint of internal consistency, temporal stability, and reliability across siblings) as well as validity (both in respect to convergence with an interview measure and with father's own report on a parallel instrument). Although some of the reliability and validity indices for the M-SMAST appeared lower than that for F-SMAST, these were all in the acceptable range. We do not wish to argue that the reliability and validity of the M-SMAST is inherently weaker than that for the F-SMAST. Because reported maternal drinking problems showed much lower base rates (and variance) than paternal drinking problems, it is possible that the generally lower reliability and validity could be due to lower base rates of reported problems in mothers. In fact, for most of our analyses using the Y statistic that adjusts for base rates, the data are fairly comparable across the F-SMAST and M-SMAST.

Furthermore, shortening both of these instruments to nine-item versions appears to improve their reliability and validity. For researchers and clinicians interested in assessing parental history of alcoholism, the F-SMAST and M-SMAST would appear to be a well validated, paper-and-pencil measure.

However, a number of limitations of these (and related scales) need to be noted. First, as is true with all family history techniques,<sup>1</sup> the sensitivities of these measures are relatively low. For example, if using a cut-score of 4 or greater on these instruments, one-sixth of the alcoholic fathers and one-half of the alcoholic mothers (as defined by parents' own scores on the SMAST; see Tables 8 and 10) would fail to be identified. It appears that an inherent limitation of the family history method is low sensitivity, at least in situations where attempts are made to keep specificity relatively high.

Another limitation of the F-SMAST and M-SMAST (and common to other family history assessment instrument) is the failure to accurately resolve important sources of heterogeneity in parental alcoholism (e.g., alcoholism subtypes, extent of comorbidity, age of onset). Although additional questions can be added to assessment protocols to measure critical sources of heterogeneity, there are inherent limitations to how much offspring, in general, know about the details of the motivations, form, and course of their parents' alcohol involvement. Thus, for many research and clinical purposes, supplementation of adapted SMASTS (or similar scales) is needed.

Two limitations of our own studies should be noted. First, our samples were comprised of college students and their relatives, a relatively homogeneous population with respect to age, social class, education, and associated social problems. Second, our studies of inter-sibling and parent-offspring agreement encountered relatively low response rates. Both of these factors argue for caution in generaliz-



ing our findings. Nevertheless, the general consistency of our findings with those obtained using other types of family history assessments bolster confidence in our estimates of the reliability and validity of the F-SMAST and M-SMAST.

#### ACKNOWLEDGMENTS

The assistance of Jill Wacker, Gail Raskin, Renee Perrigo, Kim Walitzer, and Corby Magner is gratefully acknowledged.

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