Preliminary Results of the Baltimore Health Literacy and Oral Health Knowledge Project

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Background

- Health literacy (HL) has been defined as the ability to understand, evaluate, and act on spoken, written, and visual health information to reduce risk and live a healthier life
- Established measures of HL have assessed word recognition (REALM), and/or reading comprehension and numeracy (TOFHLA)
- Some aspects of HL have not been assessed
  - Communication (listening, speaking, writing)
  - Basic conceptual knowledge

Background (continued)

- Studies in medicine have shown that limited HL is associated with several adverse health outcomes
- Fewer studies of the association between HL and oral health outcomes have been conducted
- It is hypothesized that HL may impact oral health outcomes via SES, oral health knowledge, and other relevant factors

Purpose

- Develop a valid/reliable instrument to assess basic oral health knowledge
- Test the feasibility of assessing basic oral health knowledge in a low-income population of adults
- Determine the extent to which HL (measured via REALM and Short-TOFHLA) is associated with basic oral health knowledge, controlling for relevant sociodemographic factors

Instrument development

- Content experts were convened to select topic areas and candidate questions
- Topics included basic oral health knowledge, and knowledge of disease prevention and management (dental caries, periodontal diseases, and mouth cancer)
- Candidate questions for each topic area were created in an open-ended format
- Pilot study was conducted among low-income adults (N=15) to determine response categories

Instrument development (continued)

- Pilot study results were used to re-format candidate questions into multiple-choice items
- Convenience sample (n=12) of practicing dentists in Maryland was asked to provide feedback on the resulting questionnaire
- Final oral health knowledge questionnaire contained 44 items

Question from dental caries section

What is the best way a person can prevent tooth decay at home?

a. Using a toothpick after every meal
b. Drinking sugar-free soda
c. Rinsing with a mouthwash like Listerine
d. Brushing and flossing every day
e. Don't know

Question from mouth cancer section

What is the main cause of cancer on the lip, on the outside of the mouth?

a. Sun exposure
b. Herpes
c. Heavy drinking
d. Diabetes
e. Don't know

Question from basic knowledge section

This picture shows some teeth with white spots on them. What do you think caused these white spots?

a. Too much antibiotics
b. Too much fluoride
c. Too much plaque
d. Too much calcium
e. Don't know

Study methods

- Schaefer Center for Public Policy obtained telephone listings for Baltimore postal codes
- Adults were asked to participate if they did not work in healthcare, they did not have vision problems, and English was their first language
- Participants came to the University of Baltimore to be interviewed, and received a $25 payment and packet of information and dental products
- REALM, Short-TOFHLA, and oral health knowledge surveys, and questions about sociodemographics were administered by staff

Sample characteristics (N=100)

	n	%
Age*		
18-44 years	30	30.3%
45-64 years	43	43.4%
≥65 years	26	25.3%
Sex		
Male	45	45.0%
Female	55	55.0%
Race*		
African American	92	93.9%
Other	6	6.1%

*Total does not sum to 100 due to missing values

Sample characteristics (continued)

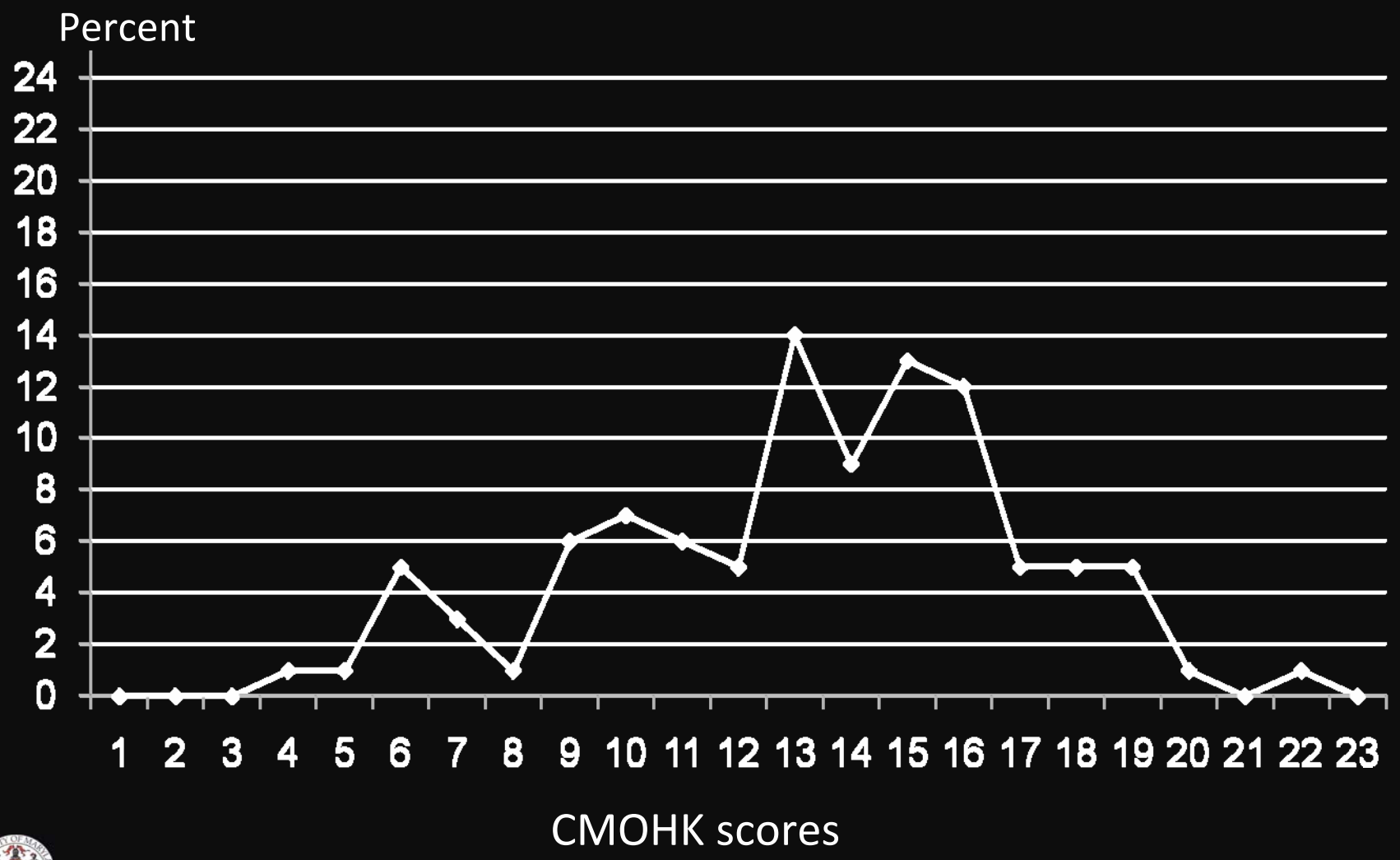
Education level*	*n*	%
<12 years	20	20.2%
12 years (or GED)	50	50.5%
>12 years	29	29.3%
Annual household income		
Unknown	15	15.0%
$0-$25,000	51	51.0%
≥$25,001	34	34.0%

*Total does not sum to 100 due to missing values

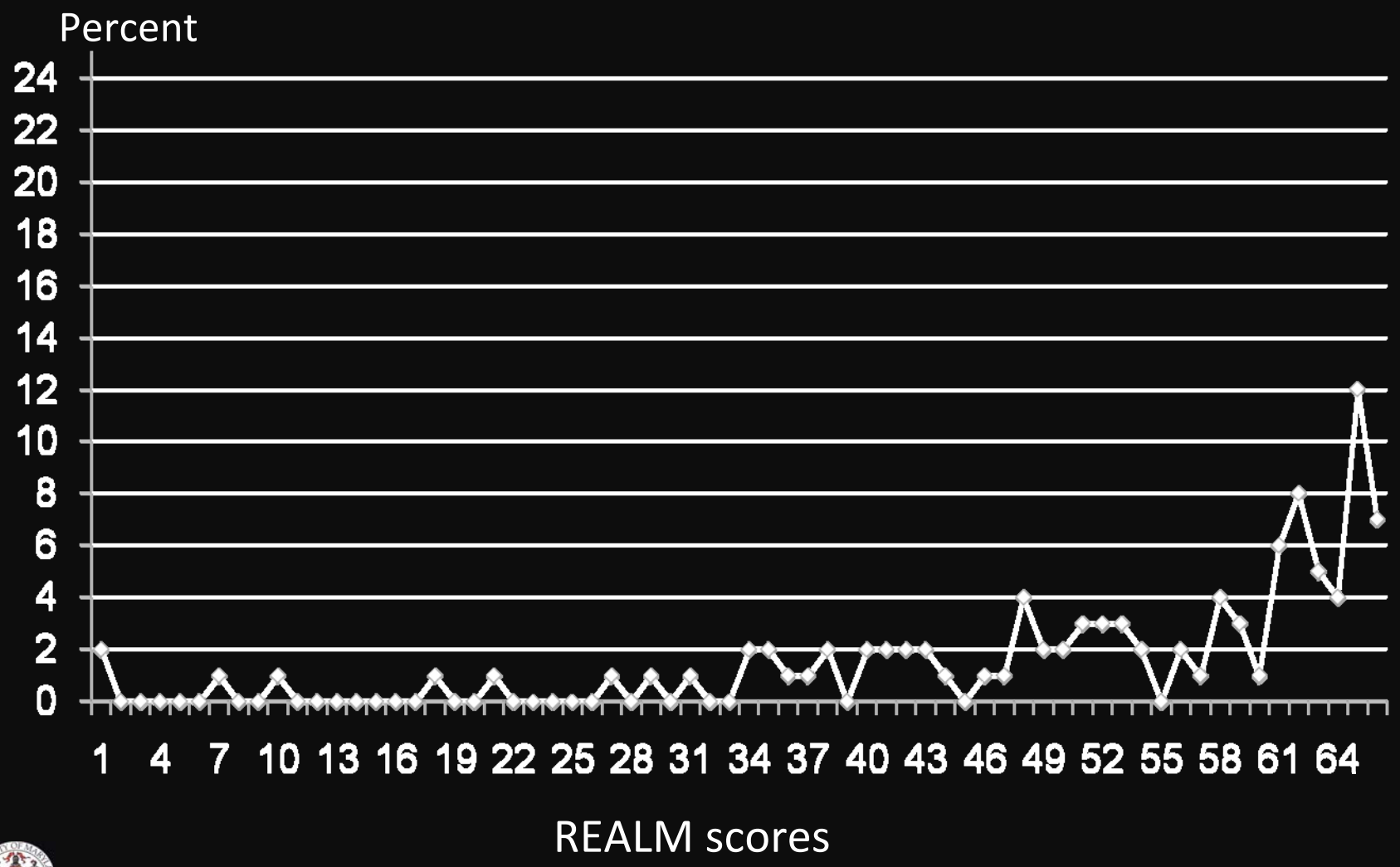
Results

- Responses were coded, entered into an Excel spreadsheet, and analyzed in SAS for Windows
- Forty-four oral health knowledge questions were reduced to 23 items (Cronbach alpha = 0.738)
  - Ten (of 20) basic oral health knowledge
  - Six (of 8) dental caries prevent/manage
  - Five (of 8) perio disease prevent/manage
  - Two (of 8) mouth cancer prevent/manage
- Scores for the resulting *Comprehensive Measure of Oral Health Knowledge* (CMOHK) were analyzed as a continuous variable

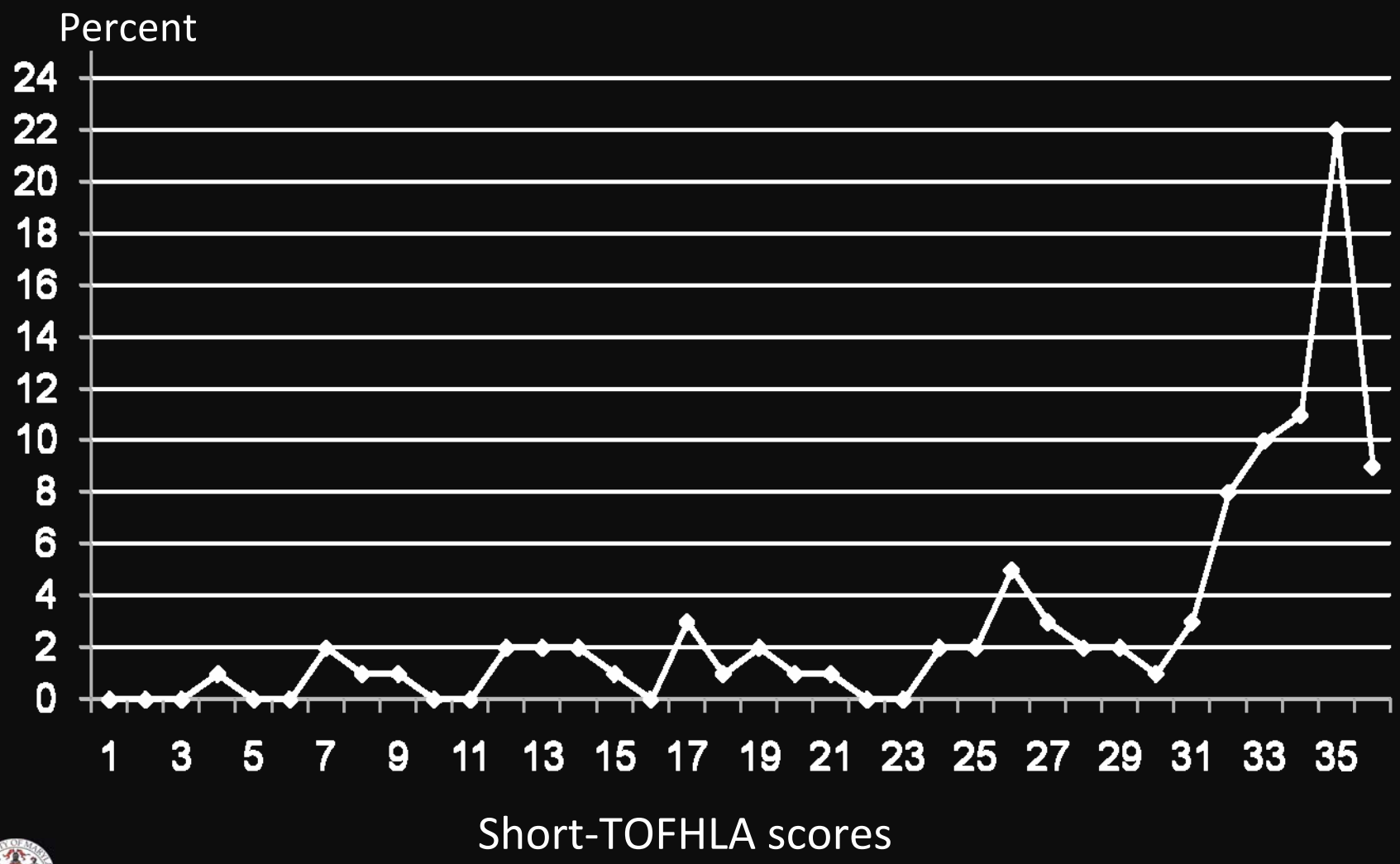
Distribution of CMOHK scores



Distribution of REALM scores



Distribution of Short-TOFHLA scores



Mean CMOHK, by sample characteristics

Overall (of 23)	13.2
Age	
18-44 years	12.2
45-64 years	13.9
≥65 years	13.8
Sex	
Male	12.6
Female	13.8

Mean CMOHK, by sample characteristics (continued)

Race		
African American	13.2	
Other	13.3	
Education level		
<12 years	10.8	$P<0.01$
12 years	13.7	
>12 years	14.4	

Mean CMOHK, by sample characteristics (continued)

Annual household income	
Unknown	12.5
$0-$25,000	13.0
>$25,001	13.9

Results (continued)

- Linear regression: REALM (categorical) was significantly associated with CMOHK score
- Linear regression: Short-TOFHLA (categorical) was not significantly associated with CMOHK score
- Multiple linear regression: REALM score (categorical) remained significantly associated with CMOHK while education level dropped out

Conclusions

- New oral health knowledge instrument has been generated
- Face-to-face evaluations of oral health knowledge are feasible in low-income, adult populations
- Pilot data have been generated and are ready to be used in support of larger, more complex studies of HL in dentistry

Conclusions
(continued)

- Suggesting that word recognition or reading comprehension explain oral health outcomes is a bit simplistic
- We hypothesized that HL in dentistry is more directly expressed by oral health knowledge
- Oral health knowledge is as good a measure of HL as is REALM, independent of education level
- Future studies need to explore these preliminary results in larger samples with more power

Thank you!

May I answer your questions?

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Question from dental caries section

What is the best way a person can prevent tooth decay at home?

a. Using a toothpick after every meal (1.0%)
b. Drinking sugar-free soda (2.0%)
c. Rinsing with a mouthwash like Listerine (13.0%)
d. Brushing and flossing every day (82.0%)
e. Don't know (2.0%)

Question from oral cancer section

What is the main cause of cancer on the lip, on the outside of the mouth?

a. Sun exposure (24.0%)
b. Herpes (33.0%)
c. Heavy drinking (6.0%)
d. Diabetes (4.0%)
e. Don't know (33.0%)

Question from basic knowledge section

This picture shows some teeth with white spots on them. What do you think caused these white spots?

a. Too much antibiotics (4.0%)
b. Too much fluoride (6.0%)
c. Too much plaque (30.0%)
d. Too much calcium (31.0%)
e. Don't know (29.0%)

CMOHK scores, by sample characteristics

	0-11	*12-14*	*15-23*
Overall	30 (30.0%)	28 (28.0%)	42 (42.0%)
Age*			
18-44 years	15 (50.0%)	6 (20.0%)	9 (30.0%)
45-64 years	9 (20.9%)	15 (34.9%)	19 (44.2%)
≥65 years	5 (19.2%)	7 (26.9%)	14 (53.9%)
Sex			
Male	17 (37.8%)	14 (31.1%)	14 (31.1%)
Female	13 (23.6%)	14 (25.5%)	28 (50.9%)

*Total does not sum to 100 due to missing values

CMOHK scores, by sample characteristics (continued)

	0-11	*12-14*	*15-23*
Race*			
African Am.	29 (31.5%)	25 (27.2%)	38 (41.3%)
Other	1 (16.7%)	2 (33.3%)	3 (50.0%)
Education level*			
<12 years	12 (60.0%)	5 (25.0%)	3 (15.0%)
12 years	11 (22.0%)	17 (34.0%)	22 (44.0%)
>12 years	6 (20.7%)	6 (20.7%)	17 (58.6%)

*Total does not sum to 100 due to missing values

CMOHK scores, by sample characteristics (continued)

	0-11	*12-14*	*15-23*
Annual household income			
Unknown	6 (40.0%)	2 (13.3%)	7 (46.7%)
$0-$25,000	17 (33.3%)	15 (29.4%)	19 (37.3%)
>$25,001	7 (20.6%)	11 (32.3%)	16 (47.1%)

Results (continued)

- Correlations between HL measures and CMOHK
  - REALM *vs*. Short-TOFHLA 0.565
  - REALM *vs*. CMOHK 0.536
  - Short-TOFHLA *vs*. CMOHK 0.201

REALM scores *vs*. CMOHK scores

	0-11	*12-14*	*15-23*
Overall	30 (30.0%)	28 (28.0%)	42 (42.0%)
0-18	3 (60.0%)	2 (42.0%)	0 (0.0%)
19-44	12 (57.1%)	6 (28.6%)	3 (14.3%)
45-60	10 (31.2%)	11 (34.4%)	11 (34.4%)
61-66	5 (11.9%)	9 (21.4%)	28 (66.7%)

Short-TOFHLA scores *vs*. CMOHK scores

	0-11	*12-14*	*15-23*
Overall	30 (30.0%)	28 (28.0%)	42 (42.0%)
0-16	3 (25.0%)	5 (41.7%)	4 (33.3%)
17-22	3 (37.5%)	3 (37.5%)	2 (25.0%)
23-36	24 (30.0%)	20 (25.0%)	36 (45.0%)