**CSER HARMONIZED MEASURE REPOSITORY: Subjective Numeracy (Adult and Parental Versions)**

| **Template topic** | **Definition/Note** |
| --- | --- |
| **Measure name and acronym** | 3-item Subjective Numeracy Scale (SNS-3) |
| **Source citation for original measure** | * Original 8-item scale (SNS-8): Zikmund-Fisher, B.J., Smith, D.M., Ubel, P.A., Fagerlin, A. Validation of the subjective numeracy scale (SNS): Effects of low numeracy on comprehension of risk communications and utility elicitations. Medical Decision Making, 2007: 27: 663-671.
* SNS-3 (used in CSER): McNaughton CD, Cavanaugh KL, Kripalani S, Rothman RL, Wallston KA. Validation of a Short, 3-Item Version of the Subjective Numeracy Scale. Med Decis Making. 2015;35(8):932–936. PMCID: PMC4592371
* Early validation of the SNS-3: McNaughton C, Wallston KA, Rothman RL, Marcovitz DE, Storrow AB. Short, subjective measures of numeracy and general health literacy in an adult emergency department. Acad Emerg Med. 2011 Nov; 18(11):1148–1155. PubMed: 22092896
 |
| **Category of assessment (construct/ CSER framework location)** | Patient factors |
| **Description of measure** | (From McNaughton et al., 2015) Perceived ability to perform various mathematical tasks and preference for the use of numerical versus prose information. The first two questions focus on self-reported numeracy skills (“fractions” and “shirt”), while the third focuses on subject preference (“useful”). |
| **Operational definition of construct** | Self-reported perceived ability to perform various mathematical tasks and preference for the use of numerical versus prose information. |
| **Summary of changes made to measure for CSER (“CSER-adapted scale”), if any** | Instruction reworded to accommodate possibility that measure would not be administered in a way that would allow respondents to check a box. |
| **Time to administer** | Unknown |
| **Target Respondent(s)** | Adult patient, Parent of pediatric patient |
| **Age range(s) of respondents** | Adults (age not reported)  |
| **Number of items**  | Original scale: 3 items (items 1, 4, and 8 from 8-item scale) |
| CSER adapted: Same as original scale. |
| **Subscales and items per subscale**  | Original scale: No subscales. |
| CSER adapted: Same as original scale. |
| **Response scale (including anchor labels)** | Original scale: 6-point Discrete Visual Analog scale in which 1= “Not good at all” (items 1 and 2) or “Never” (item 3) and 6=”Extremely good” (items 1 and 2) or “Very often” (item 3). The interior responses labeled by the numbers 2 through 5. |
| CSER adapted: Same as original scale. |
| **Scoring instructions**  | Original Scale: Sum all 3 items (although they are sometimes averaged). No instructions provided for missing values. |
| CSER adapted: Same as original scale. Recommended rule for missing data: Require at least 2 responses of 3, and use mean imputation for missing item. |
| **Validated cutoff scores, if any** | No validated cutoff scores. |
| **Norms (if available)** | None available |
| **Contact for permission to use/adapt (associated cost)** | No need to get permission to use. For questions regarding the scale, contact Candace McNaughton, MD, MPH; Phone: 615-875-7679; Email: candace.mcnaughton@vanderbilt.edu. |
| **Validated administration modes** | McNaughton et al. (2015) included seven independent samples. Different modes were used across the samples, including pencil and paper, interviews, and reading items out loud to respondents. Comparability of the measure across modes was not evaluated. |
|  **Original measure languages available**  | English, Dutch, Japanese, Norwegian, Portuguese, and Spanish (Non-English translation are 8-item version, which includes items from 3-item version; available from Angie Fagerlin at angie.fagerlin@hsc.utah.edu) |
| **Evidence for reliability (provide type and values)** | In McNaughton et al. (2015), scale was administered to seven adult patient populations: emergency department, kidney disease, primary care clinic, hemodialysis, diabetes clinic, hospitalized hypertension, hospitalized cardiovascular. Cronbach alphas ranged from .67 to .80. Alphas in 6 of the 7 samples were > .70. Median across samples = .78. |
| **Evidence for validity (provide type and values if available)** | Not yet available for CSER. McNaughton et al. (2015) evaluated validity in 7 patient samples and found: * Convergent Validity - SNS-3 correlated highly with the SNS-8 (Spearman rank correlations [rho] = .89 to .95). SNS-3 was also significantly correlated with measures of numeracy (WRAT, rho = .39 to .59; Diabetes numeracy test, rho = .41; Lipkus numeracy assessment, rho = .56),
* Nomological validity - health literacy (S-TOFHLA, rho = .24 to .38; REALM, rho = .26 to .46; TOFHLA, rho = .21; Brief Health Literacy Screen, rho = .35 to .48), and education (rho = .39 to .59).
* (See also Chakkalakal et al., 2017, Health Lit Res Pract., 1(2); PMC5991606 for effort to validate 8-item scale in minority groups.)
 |
| **Evidence for sensitivity to change** | Peters et al., 2017, PLoS One, 12(7), PMC5507517 used 8-item SNS in a 9-week randomized controlled trial of undergraduate psychology students and observed improvement in subjective numeracy in the intervention group (completed a values clarification exercise) compared to the control group (no values clarification exercise). |
| **Relevant references in genetics or genomics** | 1. Hanoch Y, Miron-Shatz T, Rolison JJ, Ozanne E. Understanding of BRCA1/2 genetic tests results: the importance of objective and subjective numeracy.Psychooncology. 2014 Oct;23(10):1142-8. doi: 10.1002/pon.3537. PMID: 24733657 (used SNS-8)
2. Hanoch Y, Miron-Shatz T, Rolison JJ, Omer Z, Ozanne E. Shared decision making in patients at risk of cancer: the role of domain and numeracy. Health Expect. 2015 Dec;18(6):2799-810. doi: 10.1111/hex.12257. PMID: 25186806 (Used SNS-8)
3. Anderson BL, Obrecht NA, Chapman GB, Driscoll DA, Schulkin J. Physicians' communication of Down syndrome screening test results: the influence of physician numeracy. Genet Med. 2011 Aug;13(8):744-9. doi: 10.1097/GIM.0b013e31821a370f. PMID: 21637105 (SNS-8)
4. Worthington AK, Parrott RL, Smith RA. Spirituality, Illness Unpredictability, and Math Anxiety Effects on Negative Affect and Affect-Management Coping for Individuals Diagnosed with Alpha-1 Antitrypsin Deficiency. Health Commun. 2018 Apr;33(4):363-371. doi: 10.1080/10410236.2016.1266576. PMID: 28059573 (5-item SNS)
 |

**Paste original scale below**

For each of the following questions, please check the box that best reflects your answer:

1. How good are you at working with fractions?

 □1 □2 □3 □4 □5 □6

 **Not at all Extremely**

 **good good**

1. How good are you at figuring out how much a shirt will cost if it is 25% off?

 □1 □2 □3 □4 □5 □6

 **Not at all Extremely**

 **good good**

1. How often do you find numerical information to be useful?

 □1 □2 □3 □4 □5 □6

 **Never Very often**

**Paste CSER adaptation below**

For each item, rate yourself on the scale from Not at all good (1) to Extremely good (6).

1. How good are you at working with fractions?

| Not at all 1◻  | 2◻ |  3◻ | 4◻ | 5◻  | Extremely good6◻ |
| --- | --- | --- | --- | --- | --- |

2. How good are you at figuring out how much a shirt will cost if it is 25% off?

| Not at all 1◻  | 2◻ |  3◻ | 4◻ | 5◻  | Extremely good6◻ |
| --- | --- | --- | --- | --- | --- |

3. How often do you find numerical information to be useful?

| Never 1◻  | 2◻ |  3◻ | 4◻ | 5◻  | Very Often6◻ |
| --- | --- | --- | --- | --- | --- |

**Paste or list CSER site-specific adaptation/deviation below**

**NA**