New face on the block: A pilot study of the Faces Anxiety Scale for measuring anxiety/fear in children undergoing painful medical procedures

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Introduction:

- Both sensory (e.g., the stimulus) and emotional (e.g., fear) factors contribute to the experience of pain. Thus, children are frequently asked to report their anxiety/fear prior to, and during, painful medical procedures.
- Unlike the numerous 1-item self-report measures of pain intensity, there are limited 1-item self-report tools for anxiety/fear.
- There is no no gold-standard 1-item self-report measure of anxiety/fear in children. The Children's Anxiety and Pain Scales (Kuttner & LePage, 1989) is often used; however, its acceptability to children and parents is low (Chambers et al., 2005).
- The Faces Anxiety Scale (McKinley et al., 2003) was developed to measure anxiety/fear in adult patients in the intensive care unit; however, it has not been used before with children.

Objective:

- We conducted a preliminary investigation of the psychometric properties of the Faces Anxiety Scale.

Methods:

This was part of a larger study on adult reassurance during children's painful medical procedures (McMurtry, 2009; McMurtry et al., in press, *Pain*).

Participants:

- Phase One – venipuncture:
    - 100 children between 5 and 10 years of age (*M* age = 8.02; *SD* = 1.69) and their parents (85 mothers, 14 fathers, 1 long term female guardian).
    - Recruited from an outpatient blood lab.
- Phase Two – two weeks following venipuncture:
    - 48 children (24 boys, 24 girls) of the participants from Phase One, (*M* age = 7.50 years, *SD* = 1.41).

Measures:

- Child distress behaviors and coping behaviors during venipuncture: Child Adult Medical Procedure Interaction Scale (CAMPIS; Blount et al., 1989).
- Children's pain: Faces Pain Scale – Revised (Hicks et al., 2001).

## Child Anxiety and Pain Scales (Anxiety scale only)

- Original validation of the measure provided evidence of content validity and interval properties.
- Later research (not designed to assess the psychometric properties of the CAPS) has supported its convergent validity (Fowler-Kerry & Lander, 1991; Kuttner & LePage, 1989).
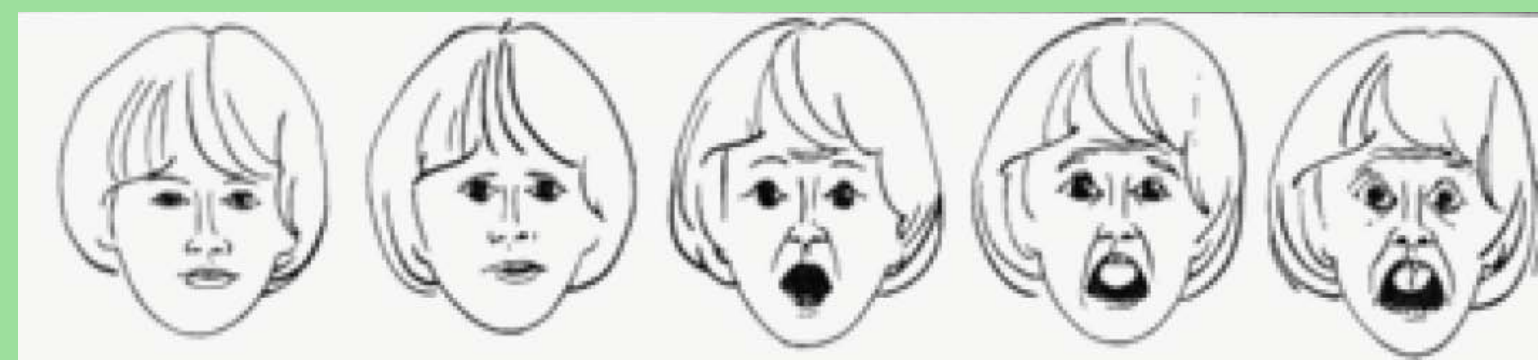
Instructions: "Point to the face that shows how scared you felt".

Faces Anxiety Scale

- Drawings based on facial muscle movements involved in fear.
- Greater ease of use then Visual Analogue Scale and questionnaire for adult patients in ICU.
- Evidence of rank order, interval properties, and criterion validity with adults (McKinley et al., 2003; McKinley & Madronio, 2008; McKinley, et al., 2004).
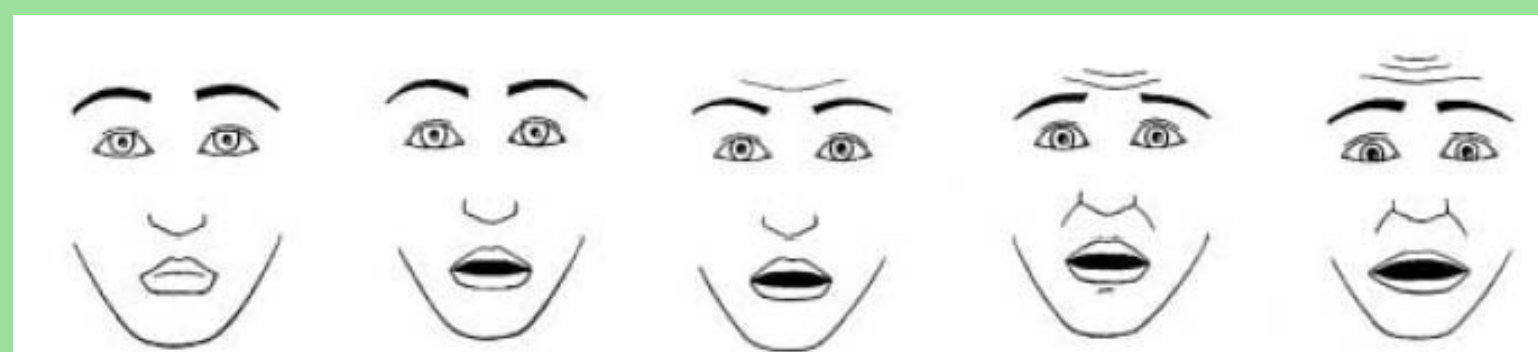
Instructions: "These faces are showing different amounts of being scared. This face *(left most face)* is not scared at all, this face is a little bit more scared *(2nd face from left),* a bit more scared *(sweep finger along scale),* right up to the most scared possible *(right-most face)*. Have a look at these faces and choose the one that shows how scared you were during the needle".

- Modified from the original instructions which used "anxiety".

Procedure:

- Faces Anxiety Scale and the CAPS were printed so that faces were equal in size.
- Phase One – immediately after venipuncture:
    - Children and parents independently completed pain and anxiety ratings.
    - Counterbalanced scale order.
    - Parents completed their ratings first: Faces Anxiety Scale and CAPS. Then children: Faces Anxiety Scale and CAPS.
- Phase Two – 2 weeks following venipuncture:
    - Same procedure as Phase One, but children and parents independently completed pain and anxiety ratings over the telephone.

Results:

Figure 1. Comparison of the response distributions for child self-report of fear using the Faces Anxiety Scale and the CAPS (anxiety).
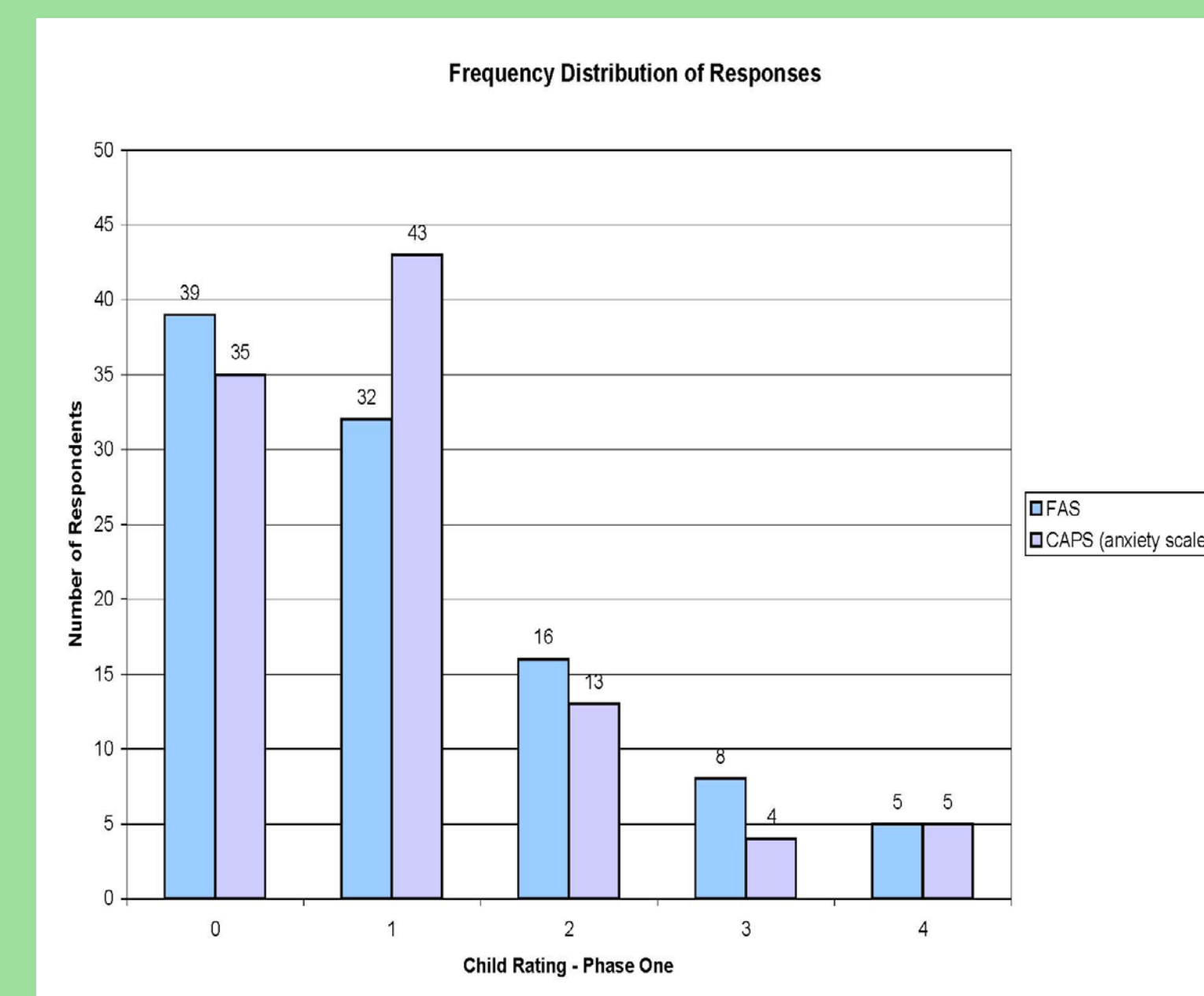
Table 1. Comparison of the descriptive statistics for the Faces Anxiety Scale and the CAPS (anxiety scale).

	FAS (0-4)	CAPS (0-4)
Mean	1.08	1.01
Std Deviation	1.15	1.05
Median	1.00	1.00
Range	0-4	0-4
Skew	0.97	1.26
Kurtosis	0.18	1.43
50th percentile	1.00	1.00
90th percentile	3.00	2.00
95th percentile	3.95	3.95

Results (cont):

Reliability:

Inter-rater: *How closely did children's and parents' ratings match?*
- Time One: $r(100) = .54, p < .001$
- Time Two: $r(48) = .62, p < .001$

Test-retest reliability*: *How stable were the ratings over time?*
- Children: $r(48) = .77, p < .001$
- Parents: $r(48) = .73, p < .001$

* Note: somewhat different than the traditional test-retest reliability as it relies on children's memories of their fear during the venipuncture.

Validity:

- Construct: *Does the Faces Anxiety Scale measure anxiety?*
    - Other self-report measure of anxiety, CAPS: $r(100) = .78, p < .001$
    - Pain self report, FPS-R: $r(100) = .60, p < .001$
        - Evidence of convergent validity
    - Distress behavior, CAMPIS: $r(100) = .47, p < .001$
        - Evidence of convergent validity

Discussion:

- Results support the use of the Faces Anxiety Scale with children. Specifically, preliminary support was found for: inter-rater reliability, test retest reliability, convergent validity, and construct validity.
- Future research should further investigate the psychometric properties of the Faces Anxiety Scale by:
    - Asking children to order the faces (rank order properties).
    - Using the Faces Anxiety Scale compared with other scales for pain of varying intensities.
- The preferences of raters between the available anxiety scales should be assessed.