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Measuring providers' verbal and nonverbal emotion recognition ability: Reliability and validity of the Patient Emotion Cue Test (PECT)

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ABSTRACT

Objective: To describe the development and validation of the Patient Emotion Cue Test (PECT) as a tool to measure providers' emotion cue recognition ability.
Methods: The PECT consists of 47 video clips depicting emotion cues that systematically vary in intensity of both verbal and nonverbal contents. The PECT assesses the provider's ability to detect and identify patients' emotion cues accurately. A multi-stage development process produced the PECT. Reliability and validity were assessed in three studies.
Results: Scores on the PECT are normally distributed with significantly above chance responding. Across three studies, the PECT demonstrates convergent validity through significant correlations with standardized tests representing multiple channels of emotion recognition, including the face, body, and voice. The PECT shows adequate inter-item and split-half reliability.
Conclusion: The PECT is an easily administered, reliable, and valid test of emotion cue recognition.
Practice implications: The PECT can be used in future research on providers' emotion recognition ability, for evaluating self-assessment of ability, and as a teaching tool in medical schools.

1. Introduction

In the clinical context, a well established link exists between effective empathic, patient-centered communication and patient satisfaction and positive health outcomes [1–6]. A critical component of patient-centered communication is the ability to detect, identify, and respond to the emotional cues of the patient [7–10]. Healthy People 2010 points to the importance of strategically using effective communication to improve patient health and puts forth a goal to "increase the proportion of persons who report that their healthcare providers have satisfactory communication skills," section 11-17 [11]. The concept of *accurate* communication is listed both within this goal and more broadly as one of the 11 attributes of effective health communication (section 11-4). Accurately recognizing patient emotions is important to effective, quality communication [12].

Those moments within the exchange when a patient presents emotional content to a provider have been operationalized and labeled in a variety of ways, as "windows of opportunity" [13], "clues" [14,15] or "empathic opportunities" [16–19]. Researchers in this area reached consensus, calling these moments "cues" and defining them as "verbal or nonverbal hints which suggest an underlying unpleasant emotion and would need clarification from the health provider" [9,20]. Emotion cues occur in a majority of consultations and with some frequency [16,21,22], but numerous studies have shown that these cues are often missed or not responded to appropriately by providers [15,19,22–27]. Failure to notice or address patients' emotional needs can lead to misdiagnosis, incorrect treatments, and poorer health outcomes [22]. Not responding appropriately to emotion cues is also associated with less patient recall of educational information in the visit [25].

Recognizing emotion cues, both verbal and nonverbal, is an important factor in empathic communication. In non-clinical contexts, accuracy of recognizing others' emotions is an important aspect of effective communication [28] and is associated with increased social and emotional competence, better relationship quality, and other positive psychosocial characteristics [29].

Providers' accuracy at emotion recognition has received less attention [30]. Previous research has looked mainly at verbal cues to patient emotions and has placed less emphasis on providers' ability to recognize patients' nonverbal emotional cues [20]. However, there is evidence that a provider's ability to recognize nonverbal emotion cues is associated with a variety of positive patient outcomes including increased patient satisfaction [31], compliance [32], and liking, rapport, and patient engagement [33].

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Despite the consequences of this skill for effective communication, there does not currently exist a clinically relevant assessment tool for emotion cue recognition ability in healthcare providers. While previous research has looked at emotion recognition ability in non-clinical contexts using standardized tests [28], there are no patient stimuli to measure emotion recognition ability in healthcare providers.

The typical paradigm for research on emotion cues in clinical interactions uses videotapes, audiotapes, or transcripts of an interaction. Trained coders identify emotion cues in the interaction and then code provider response. However, this coding approach, while suitable for some research questions, cannot assess the providers' ability or accuracy at recognizing patients' emotion cues.

One reason the coding approach cannot assess provider's emotion recognition accuracy is that the cues are identified, in almost all cases, by coders and not by the patient in the interaction [16]. The coder cannot always know whether the patient was feeling an emotion or what emotion category was being displayed. The gold standard for non-clinical work in emotion recognition is to utilize self-reported emotions or another independent method as the criterion for scoring recognition ability [34,35].

Another problem with the coding approach is that coding of provider recognition is confounded with response. Many studies coding provider responses to patient emotion cues assume not responding to a cue is an indication the provider ignored the cue *or* assume nonresponse is an indication that the cue was overlooked. These assumptions may be associated with different patient outcomes. Knowing the provider's ability to recognize cues can allow researchers to explore the difference between ignoring a cue and overlooking or missing a cue.

Although the consensus definition of emotion cue includes nonverbal behavior, another limitation of the coding approach is that emotion cues are defined primarily by their verbal content in existing research in the healthcare setting [4,26,27,36–38]. Without an established criterion or self-report, it can be difficult or impossible for coders to judge the patient's intent behind subtle nonverbal behaviors. Therefore, low intensity cues and nonverbal behavior can be overlooked [4,16]. When nonverbal behavior is considered by researchers, the behaviors are often blatant and unambiguous, such as a patient crying or sighing heavily [39].

Patients' subtle nonverbal behaviors are indispensable when a provider is attempting to recognize emotion cues and understand the emotional experience [22,23]. Nonverbal cues occur more often than verbal cues and patients with more severe health issues emit more nonverbal cues to psychological distress than patients without [24]. Patient anxiety is more easily diagnosed when providers have access to full video information than from a transcript alone [25], indicating that the nonverbal information is an important cue source. Physicians report using the nonverbal information from body language and facial expressions to gauge a patient's anxiety and desire for more information [26].

Because of the limitations of the coding approach, there is a need for a standardized, objective test of emotion cue recognition ability in healthcare providers. The ideal test would cover both verbal and nonverbal behavior, various cue channels (i.e., face, body, voice, etc.), and different emotion categories (i.e., anger, sadness, etc.), making it analogous to information available in a clinical interaction, but with an established criterion to score providers' accuracy. No existing tests of emotion recognition combine all these elements.

With these requirements in mind, the Patient Emotion Cue Test (PECT) was systematically developed as a clinically relevant test of emotion cue recognition of both verbal and nonverbal behaviors of varying intensities and spanning multiple emotion categories.

2. Method

2.1. The Patient Emotion Cue Test (PECT)

The PECT consists of 47 video clips, showing a series of emotional statements derived from real patient interactions. These statements were portrayed by a female actor, who varied her nonverbal behavior while depicting the statements. The PECT clips cover five emotional categories (anger, sadness, happiness, anxiety, and confusion) as well as neutral clips, which are defined as the absence of emotional content. The intensity of expression of the emotions varies across clips for both verbal and nonverbal behaviors representing the emotions. The emotions can be depicted as high, low, or neutral in nonverbal intensity of the emotion and as high, low, or neutral in verbal intensity of the emotion, as shown in Fig. 1.

Represented in the 47-clip test is one clip from each intensity category (e.g., high verbal and low nonverbal intensity) from each of the five emotions. There are also seven neutral clips in which both nonverbal and verbal emotional information is neutral. The clips average 3 s and each clip is followed by 8 s of black screen in which the participant responds. The PECT takes just under 9 min to complete. For information on obtaining the PECT, please contact the author.

2.1.1. Instructions, response format, and scoring

Test takers are instructed: "In this task, you will view a series of short clips of an actor portraying a patient. Your job is to watch the clip closely and decide what you think the patient is conveying. Circle either: anger, sadness, happiness, anxiety, or confusion. If the patient is not conveying any of these things, circle neutral. If you are not sure, take your best guess. You should pay attention to the words the patient is saying and what she is doing in each clip. Sometimes information comes from just the words the patient is saying. Sometimes it comes from just what the patient is doing. Sometimes it comes from both what the patient is saying and doing."

For each clip, test takers answer: "What is the patient conveying?" 1 = anger, 2 = sadness, 3 = happiness, 4 = anxiety, 5 = confusion or 6 = neutral. Responses are scored as correct if they identify an angry clip as anger, a neutral clip as neutral, a sad clip as sadness, etc. (0 = does not correctly identify emotion; 1 = correctly identifies emotion). The overall accuracy score is the average across all 47 clips, with possible scores ranging from .00 to 1.00.

2.2. Stimuli development and selection

The first step in developing the PECT was rating and selecting the verbal content. Statements were selected from transcripts of real patient interactions used in previous research [40,41]. One hundred sixty-seven potential statements were read by 21

Intensity of Nonverbal Emotion Cues	Intensity of Verbal Emotion Cues: High	Low	Neutral
High	5 clips	5 clips	5 clips
Low	5 clips	5 clips	5 clips
Neutral	5 clips	5 clips	7 clips

Fig. 1. Format of the PECT: verbal and nonverbal emotion cue intensity, number of clips for each cell in the final test.