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ADMINISTRATIVE INFORMATION**Support** - No external funding was received for this review.**Review Stage at time of this submission** - Completed but not published.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202660059**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 June 2026 and was last updated on 13 June 2026.**INTRODUCTION**

Review question / Objective This systematic review aims to synthesize and critically evaluate the psychometric evidence for figural creativity measures across diverse cultural contexts using the COSMIN framework. The review examines the methodological quality of primary psychometric studies and evaluates evidence related to structural validity, internal consistency, reliability, measurement invariance, cross-cultural validity, and other relevant measurement properties. The review further aims to identify methodological strengths, limitations, and gaps in the current evidence base to inform future research and practice.

Rationale Figural creativity measures are widely used in educational, psychological, and giftedness-related contexts and have been applied across diverse cultural and linguistic settings. However, the psychometric evidence supporting these measures remains fragmented and varies

considerably across studies in terms of methodological quality, statistical approaches, and reported measurement properties. Differences in findings related to structural validity, reliability, measurement invariance, and cross-cultural validity have made it difficult to determine the overall strength and consistency of the available evidence. Despite the widespread use of these measures, no comprehensive systematic review was identified that critically synthesizes their psychometric evidence across cultures using the COSMIN framework. Therefore, a systematic review is needed to evaluate the methodological quality of the available studies, synthesize the existing psychometric evidence, identify strengths and limitations in the current evidence base, and provide evidence-informed guidance for researchers and practitioners regarding the use of figural creativity measures across cultural contexts.

Condition being studied The condition being studied is figural creativity as a multidimensional construct and its assessment through standardized figural creativity measures. The

review focuses on instruments designed to evaluate figural creative thinking and examines the psychometric evidence supporting their use across diverse cultural and educational contexts. The review focuses on figural creativity and its assessment through standardized figural creativity measures. Specifically, it examines the psychometric properties of instruments designed to assess figural creative thinking, including evidence related to validity, reliability, measurement invariance, and cross-cultural applicability across diverse educational and cultural contexts. The condition being studied is figural creativity and its assessment through standardized figural creativity measures. The review focuses on the psychometric properties of instruments designed to assess figural creative thinking across diverse cultural and linguistic contexts.

METHODS

Search strategy A systematic search was conducted in Web of Science, Scopus, EBSCO, and ProQuest to identify studies published between 2015 and 2026. Additional searches were performed through the Saudi Digital Library (SDL) and Google Scholar to identify potentially relevant studies not indexed in the primary databases. Manual reference checking and backward and forward citation tracking were also conducted to enhance search comprehensiveness.

The search strategy combined terms related to figural creativity, psychometric evaluation, giftedness, and specific figural creativity measures using Boolean operators. The main search structure included combinations of the following terms:

(Figural Creativity OR Graphic Creativity OR Nonverbal Creativity OR Drawing-Based Creativity OR Figural Divergent Thinking OR Creative Thinking OR Divergent Thinking)

AND

(Psychometric OR Validity OR Reliability OR Measurement Invariance OR Factor Structure)

AND

(Giftedness OR Gifted Students OR Talented Students)

AND

(TTCT OR TCT-DP OR EPoC OR TCFI OR BTFC OR PIC-J OR Figural Production)

Additional search terms were incorporated when recurring terminology was identified in retrieved studies. References were managed using Zotero, and study screening was conducted using Rayyan. Study selection followed the PRISMA 2020 guidelines, including identification, duplicate removal, title and abstract screening, full-text eligibility assessment, and final inclusion.

Participant or population The review includes studies involving children, adolescents, and young adults from diverse cultural and linguistic backgrounds who participated in psychometric evaluations of figural creativity measures. The populations represented include students from early childhood, primary, secondary, and university educational settings across multiple cultural contexts.

Intervention The review focuses on standardized figural creativity measures designed to assess nonverbal and graphic aspects of creative thinking. Eligible instruments include widely used measures such as the Torrance Tests of Creative Thinking–Figural Form (TTCT-F), Test for Creative Thinking–Drawing Production (TCT-DP), Evaluation of Potential Creativity (EPoC), Thinking Creatively with Figures Inventory (TCFI), and conceptually similar instruments that assess creative performance through figural, graphic, drawing-based, or visual production tasks.

Comparator Where available, comparisons will be conducted across alternative factor structures, psychometric models, measurement approaches, cultural and linguistic contexts, and different figural creativity measures. Particular attention will be given to differences in structural validity, reliability, measurement invariance, cross-cultural validity, and overall psychometric quality across instruments and populations.

Study designs to be included Primary psychometric studies employing descriptive, methodological, validation, or quasi-experimental designs that report psychometric evidence for figural creativity measures. Relevant review studies may be used as supplementary interpretive sources.

Eligibility criteria Studies will be eligible if they are peer-reviewed publications published between 2015 and 2026 in Arabic, English, Spanish, French, German, or Portuguese. Included studies must examine standardized figural creativity measures and report psychometric evidence related to structural validity, reliability, internal consistency, measurement invariance, cross-cultural validity,

measurement error, or other relevant measurement properties. Primary descriptive, methodological, validation, and quasi-experimental studies will be considered. Studies will be excluded if they focus on non-figural creativity measures, fail to report analyzable psychometric evidence, employ case-study designs, or use creativity measures solely as outcome variables without providing independent psychometric evaluation.

Information sources Information sources will include major bibliographic databases, namely Web of Science, Scopus, EBSCO, and ProQuest. Additional records will be identified through Google Scholar searches, manual reference checking, and backward and forward citation tracking of eligible studies.

Main outcome(s) The primary outcomes include evidence regarding structural validity, factor structure, internal consistency, reliability, measurement invariance, cross-cultural validity, measurement error, and hypothesis testing for construct validity. Methodological quality ratings based on the COSMIN framework will also be synthesized.

Additional outcome(s) Additional outcomes include characteristics of the included studies, cultural and geographical distribution of evidence, sample characteristics, methodological quality ratings based on the COSMIN framework, patterns of psychometric evidence across cultural contexts, and identified methodological strengths, limitations, and research gaps.

Data management References were managed using Zotero for bibliographic organization and duplicate removal, while study screening and eligibility assessment were conducted using Rayyan. Data from eligible studies were extracted into standardized extraction forms that included study characteristics, instrument information, sample characteristics, psychometric evidence, and methodological quality indicators. Extracted data were synthesized according to the COSMIN framework. In addition, predefined quantitative decision rules, developed from COSMIN guidance and psychometric literature, were applied to standardize the evaluation of psychometric evidence and ensure consistent methodological judgments across studies. All extracted data, COSMIN ratings, and quantitative decision-rule classifications were recorded and organized for evidence synthesis.

Quality assessment / Risk of bias analysis The methodological quality and risk of bias of the

included studies will be evaluated using the COSMIN framework (Mokkink et al., 2024), which provides standardized criteria for assessing the quality of studies examining measurement properties. Each measurement property will be evaluated separately and rated as Very Good, Adequate, Doubtful, or Inadequate according to COSMIN standards.

To ensure consistent application of COSMIN across studies employing diverse psychometric methods, statistical approaches, and reporting practices, a set of adapted quantitative decision rules was developed based on COSMIN guidance and established psychometric literature. These rules operationalize methodological judgments by providing explicit thresholds for evaluating model-fit indices, reliability coefficients, measurement invariance, and other psychometric indicators. The rules do not replace COSMIN criteria but support their consistent interpretation across studies.

Quality assessment will consider study design, sample adequacy, statistical procedures, and the quality of reported psychometric evidence, including structural validity, internal consistency, reliability, measurement invariance, cross-cultural validity, and measurement error. The resulting ratings will be synthesized to evaluate the overall strength of the available psychometric evidence. The methodological quality and risk of bias of the included studies will be evaluated using the COSMIN framework (Mokkink et al., 2024). Each measurement property will be assessed separately and rated as Very Good, Adequate, Doubtful, or Inadequate according to COSMIN standards. To ensure consistent application of COSMIN across studies employing diverse psychometric methods and reporting practices, a set of adapted quantitative decision rules, developed from COSMIN guidance and established psychometric literature, will be used to operationalize methodological judgments. These rules do not replace COSMIN criteria; rather, they provide explicit thresholds for interpreting psychometric evidence and standardizing quality ratings across studies. Quality assessments will consider study design, sample adequacy, statistical methods, and the quality of reported psychometric evidence, including structural validity, internal consistency, reliability, measurement invariance, cross-cultural validity, and measurement error.

Strategy of data synthesis A narrative and comparative synthesis will be conducted to summarize and interpret the psychometric evidence reported across the included studies.

Evidence related to structural validity, internal consistency, reliability, measurement invariance, cross-cultural validity, measurement error, and other measurement properties will be extracted, classified, and compared using the COSMIN framework. Methodological quality ratings and adapted quantitative decision rules will be used to standardize judgments across studies. Comparisons will be undertaken across instruments, psychometric models, and cultural contexts to identify common patterns, methodological strengths, limitations, and evidence gaps. Where sufficient information is available, findings will be synthesized into an explanatory framework describing trends in the psychometric evaluation of figural creativity measures across cultures.

Subgroup analysis Where sufficient evidence is available, subgroup analyses will be conducted according to cultural context, geographical region, instrument type, participant characteristics, and measurement properties evaluated in the included studies.

Sensitivity analysis Formal sensitivity analyses are not planned because a quantitative meta-analysis will not be conducted. However, the robustness of conclusions will be considered in light of study quality, methodological differences, and consistency of psychometric evidence across studies.

Language restriction Arabic, English, Spanish, French, German, and Portuguese.

Country(ies) involved Saudi Arabia.

Other relevant information This review incorporates adapted quantitative decision rules derived from COSMIN guidance and psychometric literature to support consistent evaluation of psychometric evidence across studies employing diverse methodologies, instruments, and cultural contexts. The review also includes a cross-cultural classification framework to facilitate comparative interpretation of psychometric evidence across different cultural settings.

Keywords Figural Creativity; Creativity Assessment; Psychometric Evidence; COSMIN; Cross-Cultural Validity; Measurement Invariance; Structural Validity; TTCT; TCT-DP; Systematic Review.

Dissemination plans The findings of this review will be disseminated through academic publication, conference presentations, and

integration into a master's thesis in educational measurement and evaluation.

Contributions of each author

Author 1 - Eman AlRaddadi - Conceptualization, literature search, study selection, data extraction, quality assessment, data synthesis, development of quantitative decision rules, and manuscript preparation.

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Author 2 - Sharaf AL-ahmdi - Supervision, methodological guidance, critical review of the study design, interpretation of findings, and revision of the manuscript.

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