



Synthesizing Qualitative Literature: From Research to Practice



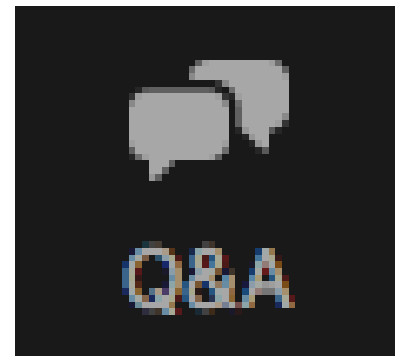
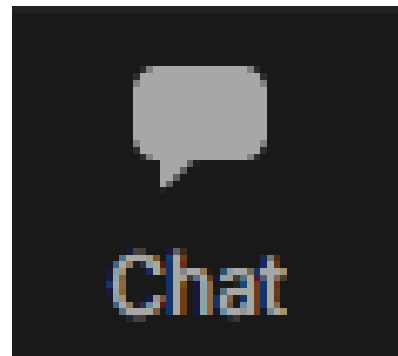
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- AI (artificial intelligence) note-taking apps will be removed
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- We will share slides *after* the webinar

- Closed Captioning



- Chat and Q&A



Session Engagement Norms



Reciprocity and Accountability

Our engagements should not be extractive, but grounded in reciprocity, integrity, and honesty. We aim to foster a collaborative balance of personal accountability among each other—people will make mistakes, and we ask that people are accountable for those mistakes. We also ask that all in attendance interact with respect to others.

Conversations End in Comma, Not a Period

Our conversations do not end after this session. We encourage the continuation and momentum of critical conversations you experience in the spirit of advancing the informal STEM education field.



Institute for Meta-Synthesis

Synthesizing Qualitative Literature: From Research to Practice

October 28, 2025

3:00-4:00 PM Webinar

4:00-4:30 PM Coffee Hour

Maria (Mia) Ong, PhD

Nuria Jaumot-Pascual, PhD

Christina B. Silva, BSW

The Team



Nuria Jaumot-Pascual
Ph.D., Co-PI



Christina Bebe Silva
B.S.W., Researcher



Lisette Torres-Gerald
Ph.D.,
Senior Researcher
& Institute Manager



Maria (Mia) Ong
Ph.D., PI

Agenda

- Qualitative meta-synthesis
 - Definition
 - Purposes
- Distinction of four meta-study designs
- An overview of our meta-synthesis stages:
 - Pre-search
 - Search and selection
 - Analysis
- Coffee hour



Definition & Purposes of Qualitative Meta-Synthesis



Definition of Qualitative Meta-Synthesis

- Umbrella term for multiple designs
- Goes beyond summarizing and reviewing the literature
- Meta-findings:
 - Integrate primary qualitative research reports
 - Use formal methods of analysis
- May or may not use systematic methods for the search and selection of literature



Purposes of Qualitative Meta-Synthesis

- Bringing together disparate qualitative literature
 - E.g., academic journal articles with book chapters, conference papers, dissertations, and other reports
- Generating new insights
 - Identifying patterns, clarifying debates in the field
- Create research agenda from identified gaps in literature
- Inform policy; suggest evidence-based promising practices



Distinctions of Four Meta-Study Designs

Four Meta-Study Designs

	Qualitative Meta-Synthesis	Quantitative Meta-Analysis	Systematic Review	Scoping Review
Type of Literature	Qualitative	Quantitative	Qualitative, quantitative, or mixed methods	Qualitative, quantitative, or mixed methods
Purpose	To answer a synthesis question	To confirm a hypothesis or theory	To provide an overview of a set of literature	To map key concepts
Search & Selection	Can use systematic methods (design dependent); Applies critical appraisal	Systematic methods; Assesses variability between studies	Systematic methods; Applies critical appraisal	Systematic methods; No critical appraisal
Analysis	Qualitative methods	Statistical methods	Summarizes literature findings	Preliminary literature assessment; Charts key concepts
Examples	Nite et al. (2017) Teasdale (2022)	Muneer et al. (2025) Sheffield et al. (2022)	Bano et al. (2024) Jenson et al. (2024)	D'Alton et al. (2025) Müller et al. (2025)

Qualitative Meta-Synthesis vs. Quantitative Meta-Analysis

- Methods used in the literature & methods used to conduct the meta-studies
 - Meta-synthesis ➔ qualitative / interpretive methods
 - Meta-analysis ➔ quantitative / experimental design

Qualitative Meta-Synthesis vs. Systematic Review

- Differences lie in their literature selection and analysis methods
 - Meta-synthesis ➔ May use systematic methods, uses formal analysis methods
 - Systematic review ➔ Uses systematic methods, may use formal analysis methods

Qualitative Meta-Synthesis vs. Scoping Review

- Differences lie in the depth of the results and use of critical appraisal:
 - Meta-synthesis ➔ In depth. Develops meta-findings. Critical appraisal
 - Scoping review ➔ Overview. Maps key concepts and main sources of evidence. No critical appraisal



Overview of the Stages of Qualitative Meta-Synthesis

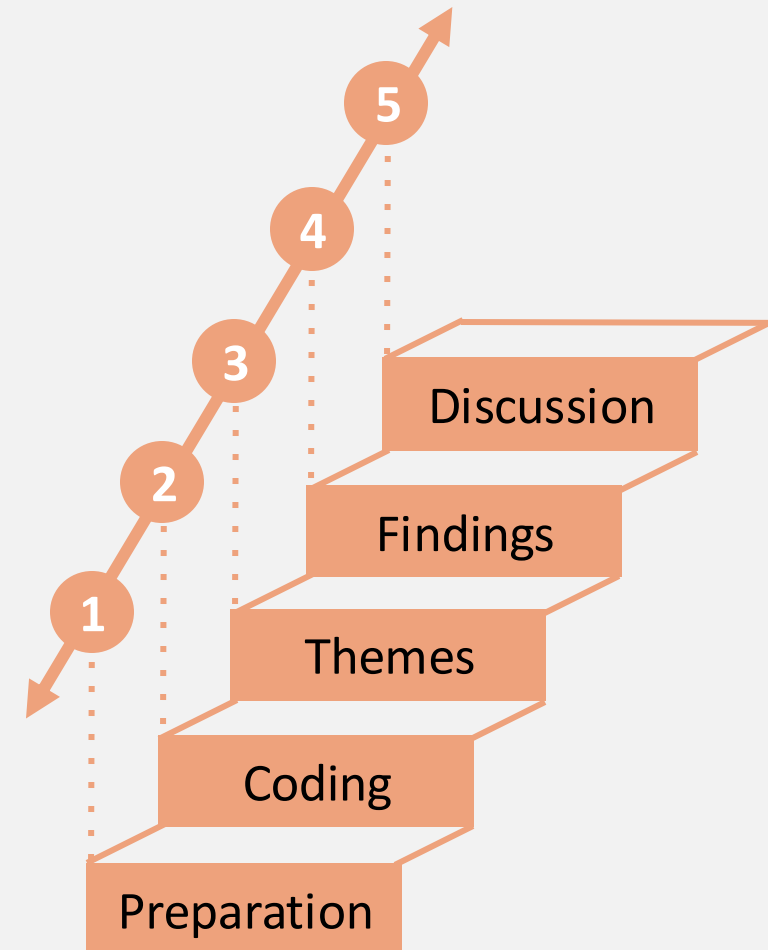
Pre-Search

- Synthesis Question
- Theoretical Framework
- Criteria
 - SEARCH
 - SELECTION
 - CRITICAL APPRAISAL
- Search Engines
- Search Terms & Strings

Literature Search & Selection

- 1 Search & Selection
 - FILTERS 1 & 2
 - CRITICAL APPRAISAL
- 2 Start Set
- 3 Snowballing
 - FORWARD
 - BACKWARD
- 4 Selection
 - FILTERS 1 & 2
 - CRITICAL APPRAISAL
- 5 Final Set of Literature

Analysis



SPECIFIC/
CONCRETE



GENERAL/
ABSTRACT

Stage 1: Pre-Search

Pre-Search

- Synthesis Question
- Theoretical Framework
- Criteria
 - SEARCH
 - SELECTION
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- Search Engines
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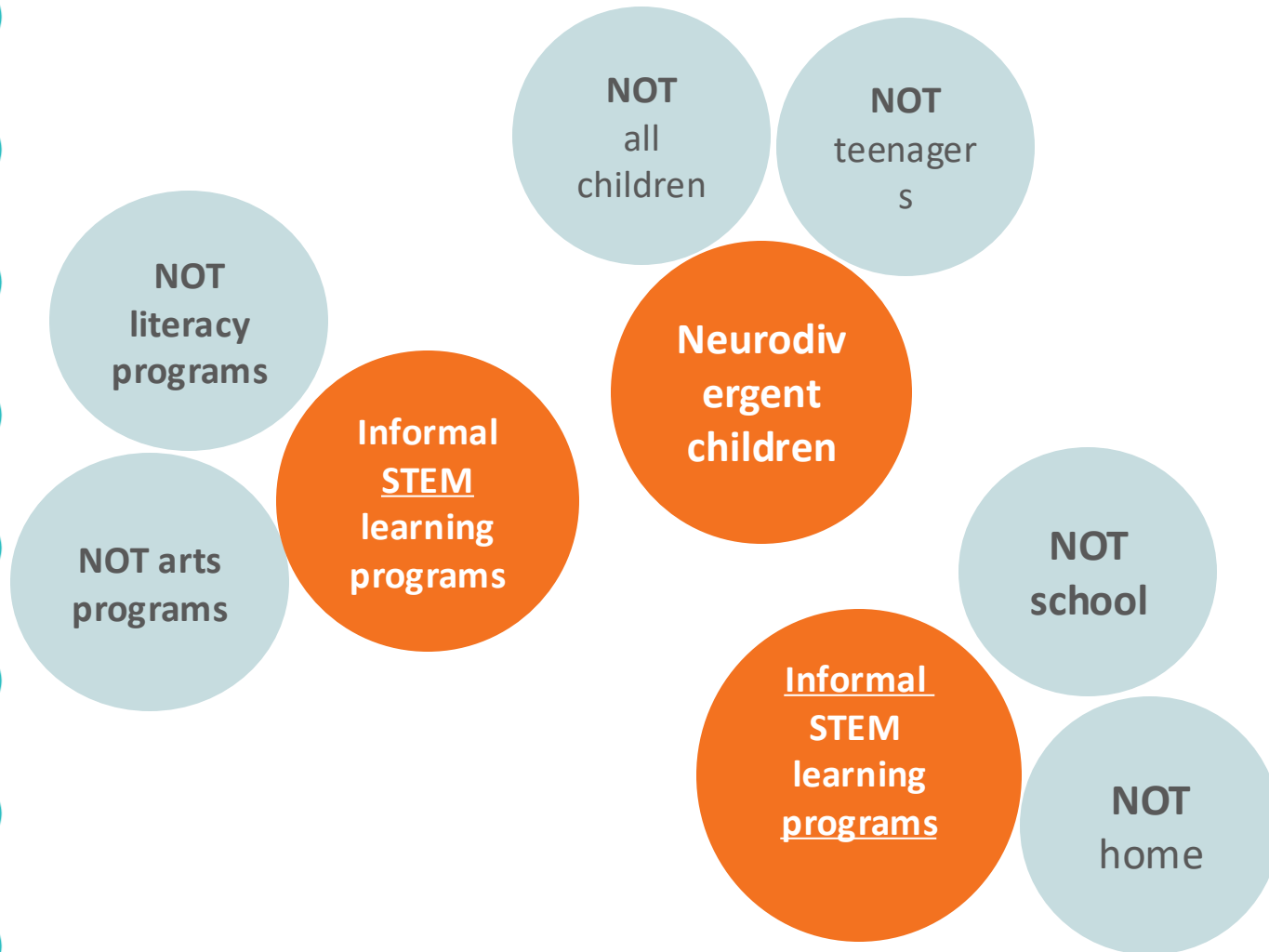
Stage 1. Pre-Search: Definition

- It takes place before identifying the literature for the synthesis.
- It involves making decisions to frame the synthesis (i.e., theoretical frame, synthesis question, search terms and engines) and to define criteria for literature inclusion and exclusion.

Pre-Search: Developing a Synthesis Question

- A synthesis question is the research question specific to the meta-synthesis study being conducted
- Delimits the phenomenon or topic of interest and the scope of the project
- Guides decisions throughout the meta-synthesis process, such as the literature eligibility criteria

Synthesis Question Example



- Example:

What programmatic elements foster neurodivergent children's development in informal STEM learning programs?



Pre-Search: Search, Selection, and Critical Appraisal Criteria

Purpose: To establish the standards for the identification of the appropriate literature to be included in the synthesis

- **Search criteria:** words and phrases entered in the selected search engines
- **Selection criteria:** narrows down search results to fit the synthesis question
- **Critical appraisal criteria:** ensure that the literature meets high research standards to put forth rigorous meta-findings

Pre-Search: Criteria Examples

Synthesis question: What programmatic elements foster neurodivergent children's development in informal STEM learning programs?

Search [title & abstract]

- Neurodivergent Children
- Informal STEM
- 2010-2025

Selection [full text]

- Neurodivergent Children
- Informal STEM
- Qualitative studies

Critical Appraisal

- Sufficient Evidence: quotes and/or images
- Rigorous Methods: research question, methods description

Pre-Search: Developing Search Terms and Search Strings

Purpose: to identify terms for efficient searches by retrieving results that are targeted and contribute to answering the synthesis question

- **Search terms:** index terms, free text/keywords, or a combination
- **Search strings:** search terms are combined with Boolean operators to create search strings



What are search terms you would consider to identify literature about neurodivergence in informal STEM education?

Pre-Search: Search Terms & Search Strings

- **Search terms** (current and historical):
 - **Neurodivergence**: [autism or autistic or Aspergers], [ADHD or hyperactive], [dyslexia or dyslexic], [neurodivergent or neurodivergence or neurodiverse or neurodiversity]
 - **Informal learning**: informal, out-of-school, free-choice, lifelong, non-formal
 - **STEM**: STEM, science, mathematics, technology, engineering

Pre-Search: Search Terms & Search Strings

- **Search strings:**

- (neurodiver* OR autis* OR ADHD OR hyperactiv*) AND (informal OR out-of-school OR free-choice OR lifelong OR non-formal) AND (STEM OR science OR math* OR tech* OR engineer*)



Articles

About 16,100 results (0.10 sec)

Any time

Since 2025

Since 2024

Since 2021

Custom range...

2010

—

2025

Search

Sort by relevance

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Any type

Review articles

include patents

include citations

Create alert

Effective inclusion practices for neurodiverse children and adolescents in **informal STEM** learning: a systematic review protocol

[PDF] springer.com

[RJ Jenson](#), [MS Lee](#), [AD Day](#), [AE Hughes](#)... - Systematic ..., 2023 - Springer

... This study's use of the term **neurodiversity** was guided by the ... Studies about **informal STEM** learning settings and ... [27, 28]; after-**school** robotics programs for youth with autism and ...

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Exploring programmatic elements that foster neurodiverse children and adolescents' participation in **informal STEM** learning programs: a systematic review

[PDF] springer.com

[RJ Jenson](#), [MS Lee](#), [AR Vollmer](#), [EE Maroushek](#)... - ... Interdisciplinary Science ..., 2024 - Springer

... **Neurodiversity** is a term that first appeared in the 1990s as a ... after-**school** settings or settings associated with **school** programs (... why **informal STEM** programs not connected with **school** ...

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Collaborative Research: Promoting Engagement in **Informal STEM** Learning as a Path to Employment for Adolescents with Autism Spectrum Disorder

[K Gillespie](#) - ... Award Number 2005772. Directorate for **STEM** ..., 2020 - ui.adsabs.harvard.edu

... Project deliverables include workshops for local after-**school** ... to apply them for **informal STEM** educators and researchers. ... 2023 made our workshops more **neurodiversity**-affirmative, we ...

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Building capacity for inclusive **informal STEM** learning opportunities for autistic learners

[PDF] springer.com

[NL Matthews](#), [H Honda](#), [MM Mitchell](#), [A Johns](#)... - ... Journal of **STEM** ..., 2024 - Springer

... , **science** media consumption, participation in **out-of-school** ... in autism, **informal** learning, and **STEM** learning. The domains ... increased inclusion in **informal STEM** learning settings will ...

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Pre-Search: Testing and Selecting Search Engines

- Ensures that searches are both effective in finding relevant literature and broad enough to identify literature that is on topic but goes beyond disciplinary silos
- Search engines examples
 - EBSCO: <https://informalscience.org/repository/access-ebSCO/>
 - REVISE Center Repository: <https://informalscience.org/resources/>
 - Google Scholar: <https://scholar.google.com/>
 - Your institution's library search engine

Stage 2: Literature Search and Selection

Literature Search & Selection

- 1 Search & Selection
 - FILTERS 1 & 2
 - CRITICAL APPRAISAL
- 2 Start Set
- 3 Snowballing
 - FORWARD
 - BACKWARD
- 4 Selection
 - FILTERS 1 & 2
 - CRITICAL APPRAISAL
- 5 Final Set of Literature



Stage 2. Literature Search and Selection

- **Purposes:**

- to identify the literature that is going to be included in the meta-synthesis
- to obtain lists of results that will be filtered to identify the literature for inclusion in the meta-synthesis

Determining Inclusion and Exclusion: Filtering and Appraising the Literature

- **Goal:** to create the start set by going through the results obtained in the previous step and narrowing them down to those that will be included (or excluded) from the meta-synthesis using the criteria
- **Start set:** preliminary set of literature identified through searches using the search strings and filters. Used for snowballing searches

Determining Inclusion and Exclusion: Filtering and Appraising the Literature

- **Filter 1:** conducts an initial screening of the results using criteria. Based on readily available information, e.g., titles and abstracts
- **Filter 2:** closer examination of the literature resulting from filter 1 with more stringent application of the criteria
- **Critical appraisal filter:** ensures that the literature follows rigorous standards

Forward and Backward Snowballing

- **Purpose:** to further develop a comprehensive set of literature that answers the synthesis question and identifies relevant literature not in the start set
- Continue snowballing until no new references appear that are relevant to your meta-synthesis (Wohlin, 2014).
 - This is not always practical as snowballing can be a time intensive process.
 - Once you decide to stop snowballing, all literature pieces that have been filtered and fulfill your criteria constitute your fullset.

Wohlin, C. (2014, May). Guidelines for snowballing in systematic literature studies and a replication in software engineering. In *Proceedings of the 18th international conference on evaluation and assessment in software engineering* (pp. 1–10). Association for Computing Machinery.
<https://doi.org/10.1145/2601248.2601268>

Forward Snowballing

Examines newer literature that cites the literature in the start set by using the “Cited by” feature on search engines

[Effective inclusion practices for neurodiverse children and adolescents in informal STEM learning: a systematic review protocol](#)

[PDF] [springer.com](#)

[RJ Jenson](#), [MS Lee](#), [AD Day](#), [AE Hughes...](#) - [Systematic ...](#), 2023 - Springer

Background Informal learning experiences in science, technology, engineering, and math (STEM) can enhance STEM learning that occurs in formal educational settings and curricula as well as generate enthusiasm for considering STEM careers. The aim of this systematic review is to focus on the experiences of neurodiverse students in informal STEM learning. Neurodiversity is a subgroup of neurodevelopmental conditions, such as autism, attention deficit disorder, dyslexia, dyspraxia, and other neurological conditions. The neurodiversity ...

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Backward Snowballing

Utilizes the bibliographies of literature pieces in the start set

sion of and learning for neurodiverse K-12 STEM learners is important for increasing access to STEM learning, improving STEM learning, STEM-interest and building self-efficacy as a STEM learner.

The results will be useful for informal STEM program leaders, STEM educators, and STEM education

References

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Jenson et al. *Systematic Reviews* (2023) 12:109

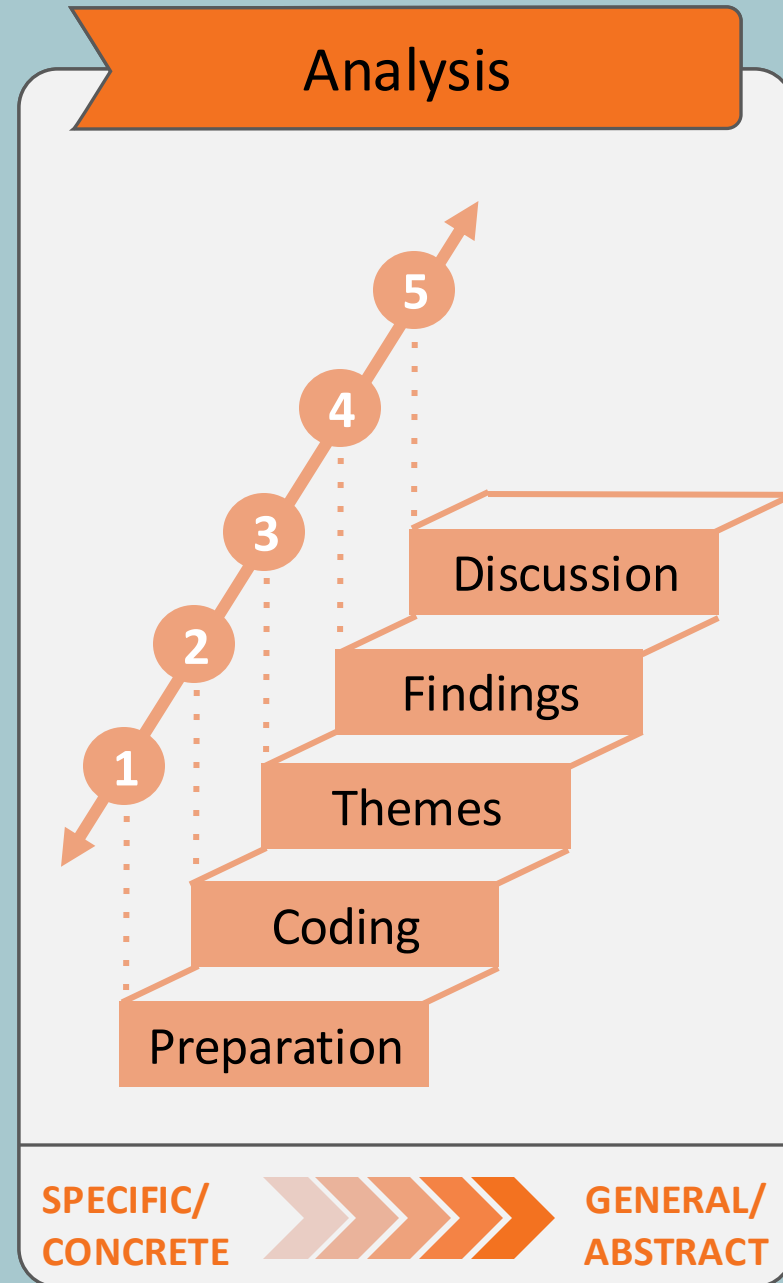
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Stage 3: Analysis





Analysis: Definition

- **Purpose:** the development of meta-findings that provide a new understanding of the phenomenon of study
- **Process:** implementation of the formal analysis method selected by the synthesis authors (e.g., content analysis, thematic analysis) to the final set of literature

Applying Thematic Analysis

- **Purpose:** to develop overarching themes that group the coded data and shape the meta-findings
- **Steps**
 - *Coding* the full set of literature
 - Developing *descriptive themes*. Codes are clustered under a unifying concept
 - Generation of *analytical themes* that cluster descriptive themes together in a more abstract manner

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, 8(1), 45.

Applying Thematic Analysis

Synthesis Question: What programmatic elements foster neurodivergent children's development in informal STEM learning programs?

Codes

- Neurodivergence: autism, ADHD, dyslexia, other
- Programs types (e.g., afterschool, museum, zoo, media) & formats (e.g., skill-based, inquiry-based)
- Outcomes: positive (e.g., youth development, participation), negative (e.g., dropping out), other

Descriptive Themes

- Types of programs and formats that support positive neurodivergent children's development

Analytical Themes

- Neurodivergent children's **self-determination** (Deci & Ryan, 2012) in informal STEM learning

Deci, E. L., & Ryan, R. M. (2012). Self-determination theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (pp. 416–436). Sage Publications Ltd. <https://doi.org/10.4135/9781446249215.n21>

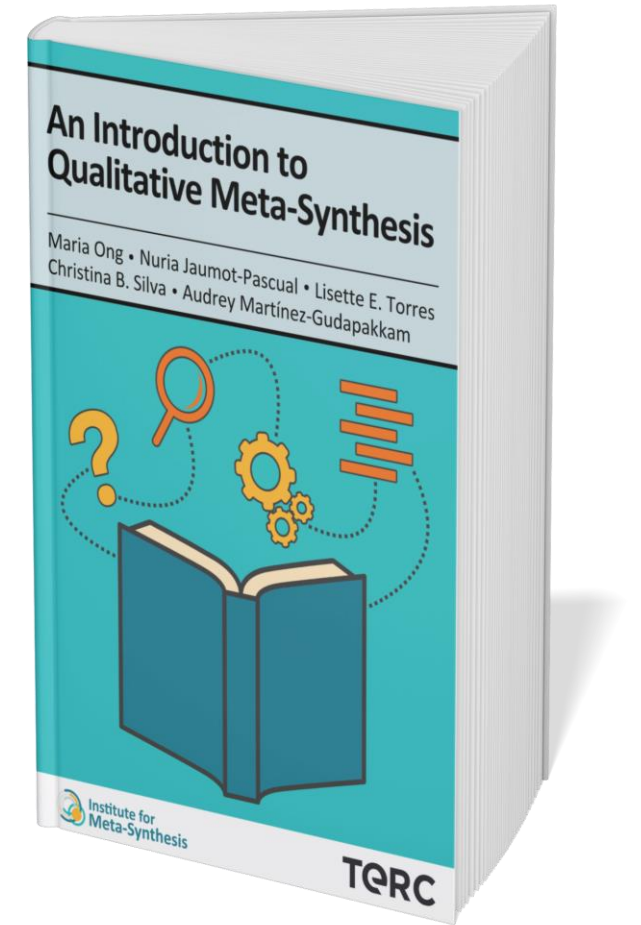
Resources

Institute for Meta-Synthesis Website

<https://www.terc.edu/metasyntesis/>

Introduction to Qualitative Meta-Synthesis Free E-Book

<https://tinyurl.com/QMS-EBook>



Want to Learn More?

- Have questions? Interested in an advanced workshop on qualitative meta-synthesis? Contact Lisette Torres-Gerald (Institute Manager): Lisette_Torres@terc.edu
- Visit our website: www.terc.edu/metasyntesis
- User Guide
- Coffee "hour" -- stay on Zoom!

Stay in touch and let us know how your qualitative meta-synthesis is going!

Thank You & Acknowledgments

- **Host:** REVISE Center (NSF/DRL-2229061)
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- **Team Members** (Prior and Current): Lisette Torres-Gerald, Maria Jimenez, Elizabeth Xintarianos, Valeria Alderete, Angela D'Souza, Lorelle Espinosa, Jodut Hashmi, Apriel Hodari, Rachel Kachchaf, Lily Ko, Heather Lavender, Valerie Martin, Gary Orfield, Ada Ren-Mitchell, Janet Smith, Carol Wright, & Katie Yao
- **Partners and Advisors** (Prior and Current): Mona Abo-Zena, Detris Adelabu , Maura Borrego, Enobong Branch, Quincy Brown, Patricia Garcia, Jori Hall, Felicia Jefferson, Elizabeth Pope, Erin Scott, Sheree Sharpe, & Rebecca Stallworth



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Q&A

Please complete our brief post-session survey



surveys.terc.edu/NoviSurvey/n/zz2e7.aspx

Upcoming from REVISE

Date	Event
Nov. 19	REVISE Drop-In Session
Dec. 2	Playful Pathways to AI Literacy in Informal STEM: Part 1 (Listening Session)
TBD	Playful Pathways to AI Literacy in Informal STEM: Part 2 (Webinar)

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Coffee Hour



Guiding Questions

- Within your area, what main topics would you consider for a qualitative meta-synthesis? Why?
- How might a qualitative meta-synthesis on these topics influence practice?
- Think about the professional organizations to which you belong. How might a meta-synthesis inform practice at an organizational level?