

EDITORIAL**Enhancing Qualitative Research with Thematic Analysis Matrix (TAM): A Systematic Approach to Thematic Analysis in Architectural Research****Mohd Zairul^{1*}**¹Faculty of Design and Architecture, Universiti Putra Malaysia.

m_zairul@upm.edu.my

Abstract

Qualitative research provides deep insights into human experiences, yet researchers often struggle with systematically organizing and interpreting qualitative data. The Thematic Analysis Matrix (TAM) offers a structured methodological framework that enhances data transparency, coherence, and replicability. By breaking down qualitative data into inductive codes, which comprise coding, categorization, and final themes, TAM ensures that research findings are rigorously structured and methodologically sound. This editorial note explores how TAM strengthens thematic analysis, using the study on sensory perception in architectural experience as a key example.

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Introduction

Thematic analysis is a widely utilized qualitative research method that focuses on identifying, analysing, and reporting patterns (themes) within data. This method is particularly valued for its flexibility and ability to provide a rich, detailed, and nuanced understanding of qualitative data across various fields, including psychology, healthcare, and social sciences. The process typically involves several key steps, which can vary slightly depending on the specific framework employed but generally adhere to a systematic approach. One of the most recognized frameworks for conducting thematic analysis is that proposed by (Clarke, Braun., Braun, 2012), which outlines a six-phase process: familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report (Askola et al., 2020; Lee, 2024; Tangen et al., 2021).

This structured approach allows researchers to systematically engage with their data, ensuring that the analysis is thorough and reflective of the participants' experiences. For instance, in a study examining the experiences of individuals living with mesothelioma, the researchers employed a six-step thematic analysis to capture the nuanced experiences of gender in relation to the illness (Ejegi-Memeh et al., 2021). The flexibility of thematic analysis allows it to be applied in various contexts and disciplines. For example, it has been effectively utilized in healthcare research to explore patient experiences and perceptions, as seen in studies analyzing stakeholder experiences in integrated healthcare settings (Trankle et al., 2020). Similarly, thematic analysis has been employed in educational research to understand the perspectives of students regarding co-teaching practices (Wagner, 2023). This adaptability is one of the reasons why thematic analysis is often chosen over other qualitative methods, as it can be tailored to fit the specific needs of the research question and the data being analyzed (Mohd Zairul, 2023; Zairul, 2021).

Moreover, thematic analysis can be conducted using both inductive and deductive approaches. An inductive approach allows themes to emerge from the data without preconceived notions, while a deductive approach tests existing theories against the data (Braun & Clarke, 2020; R. Rosairo, 2023). This duality enhances the method's applicability across various research contexts, enabling researchers to either explore new phenomena or validate existing theories. For instance, a thematic analysis of parent-child conversations about COVID-19 utilized an inductive approach to uncover themes related to communication strategies during the pandemic (Tambling et al., 2021).

Hence, thematic analysis is a robust qualitative research method characterized by its systematic approach to identifying and interpreting patterns within data. Its flexibility, structured phases, and applicability across diverse fields make it a favoured choice among researchers seeking to gain deeper insights into complex qualitative data. As the method continues to evolve, ongoing discussions about best practices and methodological rigor are essential to ensure high-quality research outcomes (Braun & Clarke, 2020, 2022b, 2022a; Clarke, Braun., Braun, 2012).

Structuring Qualitative Data through Inductive Coding

The Thematic Analysis Matrix (TAM) framework facilitates a systematic progression in qualitative data analysis, guiding the process from initial coding through categorization to the development of final themes. This paper outlines the key steps undertaken to establish a comprehensive thematic analysis process, which is subsequently structured within the TAM framework.

Coding: Assigning labels to individual concepts.

The creation of codes in thematic analysis is a crucial stage that helps researchers systematically identify and organize patterns in qualitative data. The process typically begins with data familiarization followed by generating initial codes that label significant features of the data. Researchers often begin with open coding to capture unexpected dimensions in the data, as illustrated by approaches in studies of preschool children's drawings (BAY, 2020). Open coding enables the researcher to assign preliminary labels and allows for the emergence of *in vivo* codes based directly on the language and context of the interview or textual data (Mukona et al., 2024).

The process of creating a coding scheme involves iterative discussions among multiple researchers to increase the dependability and credibility of the codes. Independent coders often apply the codebook separately and subsequently reconcile differences through consensus discussions, as seen in studies involving patient satisfaction surveys and opioid risk management (Tata et al., 2023). Maintaining an audit trail of coding decisions and revisiting data through repeated iterations also supports the trustworthiness of the analysis (Mukona et al., 2024; Tata et al., 2023). Furthermore, advanced tools such as ATLAS.ti and emerging technologies like ChatGPT have been explored for their potential to streamline coding by automating parts of the coding process and providing consistency checks, which illustrates the evolving nature of the method in qualitative research (Drápal et al., 2023).

Categorization: Grouping related codes into broader conceptual categories

Creating categories from codes in thematic analysis involves a systematic approach to organize qualitative data in a manner that elucidates underlying themes and constructs. This process typically follows a well-defined analytic framework, which

includes the identification of initial codes that are grouped into broader categories reflecting common patterns across the data set. The iterative nature of thematic analysis allows researchers to develop a nuanced understanding of the data, which is particularly important in qualitative research where human experiences and perceptions are being examined (Suwanbamrung & Kaewsawat, 2020; Vaismoradi et al., 2013).

Initially, the coding process begins with an open coding approach, where researchers create initial codes based on their reading of the data. This phase is crucial as it allows for comprehensive engagement with the material, making room for emergent insights that may not have been anticipated (Kontrimienė et al., 2020). As highlighted by (AKŞİT et al., 2023) this step involves gathering raw data, transcribing it, and generating codes through a participatory process involving multiple researchers to ensure various perspectives are captured (AKŞİT et al., 2023). The emergence of codes often employs inductive reasoning, with researchers identifying themes that arise directly from the data rather than imposing pre-existing categories (Kontrimienė et al., 2020).

Once the initial codes are established, the next step is clustering these codes into categories. This stage involves comparing and contrasting different codes to identify relationships and patterns among them, leading to the creation of significant, overarching categories. (Grinshtain & Gibton, 2017) reference the importance of using comparative analysis during this phase, encouraging examination of coded elements to derive subcategories that can further refine thematic understanding (Grinshtain & Gibton, 2017). In a study on chronic musculoskeletal pain from patient perspectives, (Ernstzen, 2013) describe the iterative clustering process that involves developing significant categories supported by evidence drawn from significant statements within the data (Ernstzen et al., 2016).

Moreover, feedback loops where researchers revisit the data while analyzing categories enhance reliability and validity in this process. According to (Vaismoradi et al., 2013), researchers should maintain continuous engagement with the original data as they categorize codes to ensure that categories accurately reflect the complexity of the participants' experiences (Vaismoradi et al., 2013). Themes derived from these categories should not only represent the data accurately but should also resonate within theoretical frameworks relevant to the research area being investigated, as discussed by Kontrimienė et al. (Kontrimienė et al., 2020).

As researchers refine their categories, the focus shifts from strictly coding to thematic development. Wan and Nasr emphasize that this transition is often marked by identifying commonalities among categories, leading to overarching themes that encapsulate the essence of the data collected (Wan & Nasr, 2021). This thematic structure requires a synthesis of knowledge gained at each previous stage, thus underscoring the importance of maintaining a clear audit trail that documents coding decisions and adjustments throughout the analytical process (Ernstzen et al., 2016).

The specific techniques employed for constructing categories can vary based on the methodological approach taken. Some researchers, for example, adopt a hybrid method combining deductive reasoning with inductive findings to create a rich tapestry of categories grounded in both existing literature and new insights gleaned from the data (Suwanbamrung & Kaewsawat, 2020). The reliance on both a priori categories and emergent ones allows for a robust framework to be established, capturing the multifaceted nature of the phenomena being studied (AKŞİT et al., 2023).

Final Themes: Synthesizing categories into overarching themes that address research questions

Creating final themes in thematic analysis is a critical step in qualitative research that synthesizes findings from the comprehensive analysis of qualitative data. This process involves narrowing down initially identified themes to distinct, coherent narratives that respond to the research question and encapsulate the participants' experiences and perspectives. The successful formulation of final themes leverages iterative and reflective approaches to the thematic analysis process, which follows various stages outlined in the literature.

The first step involves familiarizing oneself with the data, along with generating initial codes that highlight significant pieces of information within the data set. This initial coding is fundamental, as it sets the groundwork for identifying patterns and meanings. (Ali et al., 2017) emphasize that a structured iterative process is beneficial; researchers should reconsider and refine initial themes at multiple stages, ensuring that they resonate deeply with the data (Ali et al., 2017). Researchers must continually return to the data to ensure that the themes represent accurate interpretations of the participants' viewpoints.

As themes are formed, the next phase involves reviewing and refining these themes. Rigorous discussion among research team members can lead to the identification of broader thematic categories that capture the essence of multiple codes. (Benton et al., 2023) illustrate how team discussions were pivotal in finalizing the thematic structure, demonstrating that collaboration in thematic analysis enhances the depth of insights (Benton et al., 2023). Comparison of themes against the data ensures their alignment with the overall narrative flowing through the dataset (Sizoo et al., 2020).

Moreover, it is essential to define and name themes meaningfully. Each final theme should convey clear, concise insights that reflect complex interrelations within the data while being relevant to the research question being addressed. Themes should not only summarize findings but also express the significant contextual frameworks in which participants articulate their experiences (White et al., 2024).

An implementation of a flexible thematic analysis approach can be seen in the study by (García-Molina & Cortés-Calvo, 2024), which systematically categorized narratives drawn from interviews into comprehensive themes that reflect Spanish autistic mothers' lived realities (García-Molina & Cortés-Calvo, 2024). The authors illustrate the iterative connection between emerging themes and the data, capturing distinct nuances relevant to their research context.

Ultimately, the final themes are expected to address the research question comprehensively. By implementing comprehensive definition and refinement processes, researchers can distill themes that resonate with participants' authentic experiences, ensuring that the themes address nuanced aspects of the research inquiry and effectively communicate these insights to the audience (Doğusan & Koçak, 2021). This process leads to the creation of a thematic map that reflects both inductive and deductive insights, consolidating the findings into actionable knowledge (Du et al., 2021).

In conclusion, creating final themes in thematic analysis transcends mere categorization; it encompasses a thorough, iterative approach that yields insights aligned with the research objectives. Engagement with the data throughout the coding and theme development stages, team collaboration, and a focus on accurately representing participants' perspectives are essential to yielding meaningful conclusions from qualitative research.

Emerging Themes: These are unexpected patterns that arise during analysis but were not initially considered in the objectives.

Emerging themes in thematic analysis often reveal unexpected patterns that can provide profound insights into the subject matter being studied. The systematic process of identifying, analyzing, and reporting these themes can lead to uncovering aspects of participants' experiences that were not anticipated at the outset. This analytical depth is essential in qualitative research, facilitating a comprehensive understanding of complex phenomena.

A prime example is found in the study by Fiolet et al., (2019)., which employed thematic analysis to explore Indigenous perspectives on help-seeking for family violence Fiolet et al. (2019). The analysis not only revealed common barriers to seeking help, such as cultural stigma and mistrust of formal systems, but also uncovered unexpected findings regarding the influence of community resilience and support systems. The emergent themes indicated that while systemic barriers exist, there is a robust community-based support network that serves as a primary resource for individuals in crisis, thus highlighting the duality of challenges and strengths in help-seeking behavior.

The work of Peng et al., (2023) on bereavement care in emergency departments also unveils unanticipated themes related to staff resilience and emotional strain during patient interactions following a loss (Peng et al., 2023). While the initial coding aimed to understand perceptions towards bereavement care, the analysis revealed an emergent theme of emotional labor performed by staff, highlighting how personal experiences of loss among caregivers influenced their professional interactions. This created an avenue for enhanced training focusing on emotional support, ultimately improving staff resilience and patient outcomes.

Similarly, Hinic's study on coping with unexpected childbirth experiences presents significant emerging themes that challenge conventional narratives about birth satisfaction (Hinic, 2021). Despite experiencing unplanned cesarean sections, participants reported levels of satisfaction comparable to those who underwent unmedicated births. This unexpected finding serves to shift the discourse around maternal satisfaction, indicating that the adaptability of parents in the face of challenges can fundamentally reshape experiences of childbirth.

The study by Zhou et al. further illustrates the value of examining unexpected themes in qualitative research, revealing intricate dynamics in patient-provider communication during medical procedures (Zhou et al., 2024) Emphasis was placed on the distinct perspectives that emerged from both patients and healthcare professionals, revealing discrepancies in expectations and satisfaction. This emergent insight has important implications for training healthcare providers to better align patient and practitioner expectations, ultimately enhancing care quality.

To sum up, the process of identifying emerging themes in thematic analysis is integral to uncovering unanticipated insights from qualitative and narrative data. Through careful and iterative analytical processes, researchers can highlight complex interactions and perspectives that may go overlooked in more conventional inquiries. Whether examining cultural dynamics in help-seeking behavior, exploring emotional labor in healthcare settings, or investigating childbirth experiences, these unexpected themes enrich the understanding of how diverse lived experiences shape individuals' interactions with health, community, and social systems. This hierarchical structuring ensures that qualitative findings are logically organized and transparently reported.

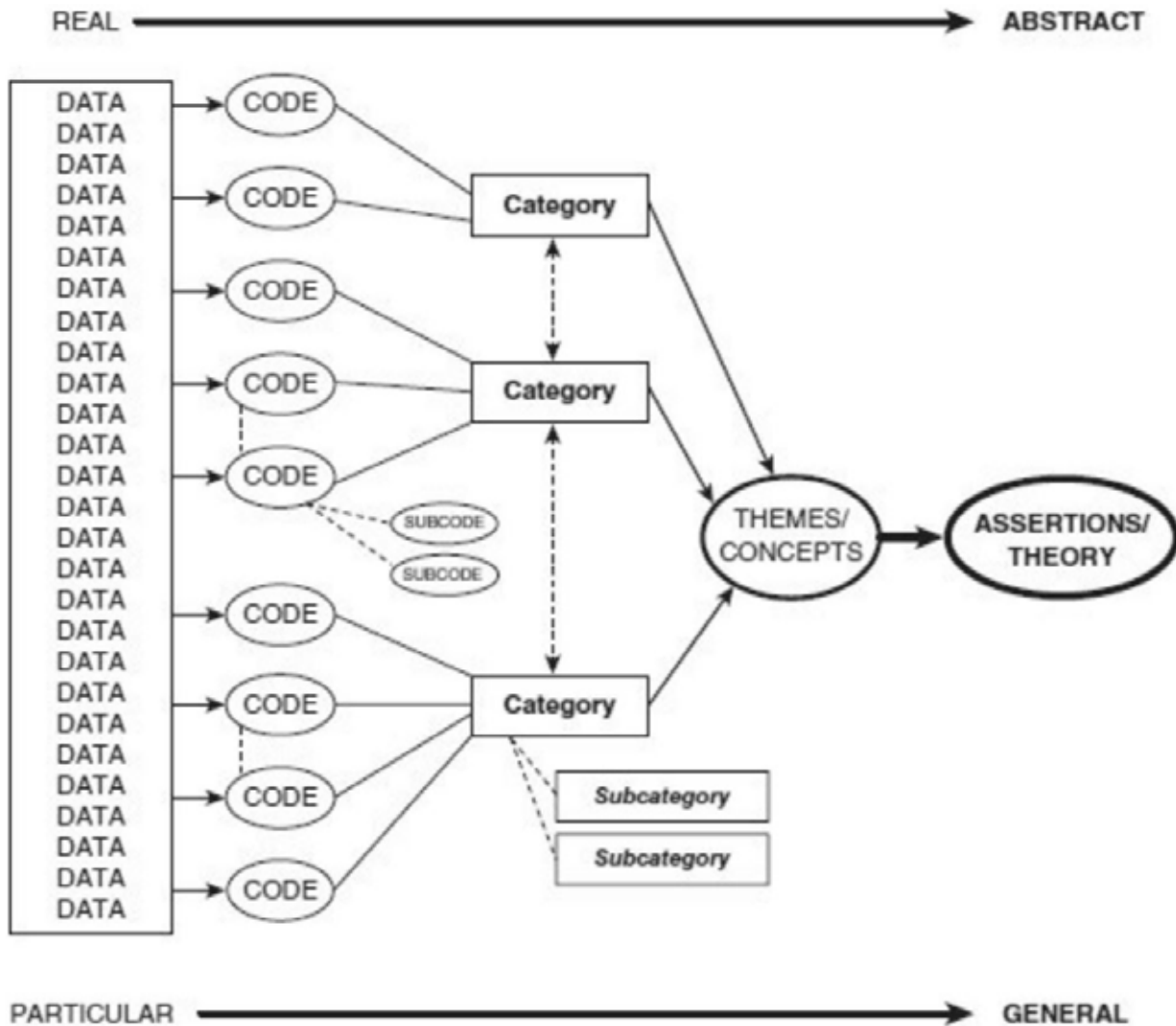


Figure 1: Saldana's Coding Approach

Saldana's approach (figure 1) to thematic analysis and code crunching has served as a source of inspiration for my own method. Saldana's approach is characterized by a meticulous, systematic process that emphasizes the importance of being attentive to the nuances of language and meaning when analyzing qualitative data. I have found this approach to be particularly effective in guiding my own analysis, as it has enabled me to derive rich and meaningful insights from complex data sets. By adopting Saldana's approach, I can effectively identify and label key themes and create a comprehensive codebook that captures the various nuances and complexities of the data. Thus, Saldana's approach has been instrumental in shaping my own style of thematic analysis and code crunching and has contributed significantly to my ability to derive meaningful insights from qualitative data through TAM.

Strengthening Thematic Development through Data Triangulation

TAM supports data triangulation by incorporating multiple data sources—including in-depth interviews, observational studies, and spatial analysis—to ensure the validity of emerging themes. For example, in the study on sensory perception in architecture, data were collected from:

- Architects and Interior Designers (experts in spatial design).
- Urban Planners (who integrate sensory elements into large-scale environments).
- Building Users (individuals experiencing architectural spaces daily).
- Environmental Psychologists (specialists studying the psychological effects of built environments)

By integrating multiple perspectives, TAM validates thematic insights and reduces bias in qualitative research.

Mapping Qualitative Insights into Meaningful Themes

A primary strength of TAM is its ability to transform raw qualitative data into structured, meaningful themes. In the study, TAM facilitated the identification of five key themes, ensuring a clear link between research questions, inductive codes, and thematic outcomes. By systematically structuring qualitative findings, TAM enhances clarity, prevents fragmentation, and improves research communication.

Tip: Create a Thematic Analysis Matrix (TAM) to summarize your results chapter and ensure that the final themes are clearly linked to the corresponding sub-research questions.

Table 1: Thematic Analysis Template Copyright No: LY2024W05247

Main RQ: [Put your main RQ here] Aim of research: [State the aim of your research] Research inquiry: [Specify the research methodology, e.g., phenomenological study] Informants: [List relevant participants, informants e.g., architects, interior designers, building users] Data collection methods: [Mention the methods used, e.g., in-depth interviews, observations, spatial analysis]						
Research Questions	Deductive codes / Theories	Strategy of inquiry	Inductive codes			Emerging themes
			Coding	Category	Final Theme	
Sub RQ 1: [Break down your main RQ into specific, focused sub-questions]	[Mention any theoretical frameworks or pre-existing codes that guide your analysis]	[Specify the data collection approach, e.g., interviews, focus groups, observations, surveys, ethnographic studies]	[Identify specific patterns, behaviours, or elements derived from the data] [Identify key inductive codes relevant to your study]	[Group related inductive codes into broader conceptual categories] [Group inductive codes into meaningful categories]	[Synthesize categories into overarching themes that answer research questions] [Summarize categories into overarching themes]	[List the key themes that emerged unexpectedly from your analysis] [emerging themes]

Enhancing Trustworthiness in Qualitative Research

Qualitative research is often criticized for lack of transparency and transferability. TAM addresses this by explicitly documenting how themes emerge from raw data for example, in analysing multisensory architectural experiences, TAM demonstrated:

- How lighting influences emotional responses.
- How acoustic conditions shape spatial comfort.
- How material textures affect tactile engagement

By providing step-by-step thematic development, TAM ensures academic rigor, transparency, and trustworthiness.

TAM as a Gold Standard for Thematic Analysis

The Thematic Analysis Matrix (TAM) is an essential tool for qualitative researchers seeking to enhance structured reporting and thematic clarity. As seen in the study on sensory perception in architecture, TAM facilitates (table 2,3,4):

- A structured inductive coding process (Coding → Categorization → Final Themes).

- Data triangulation for thematic validation.
- Transparent and replicable thematic analysis

Whether applied in architectural research, environmental psychology, or user-centered design, TAM serves as a gold standard for ensuring methodological rigor, transparency, and systematic reporting in qualitative studies.

Table 2: Formulating codes for the TA (thematic analysis) using TAM

Main RQ: How do sensory elements in architectural design influence user experiences, and how can they be systematically integrated into practice? Aim of research: To investigate the influence of sensory elements in architectural design and develop a framework for their systematic integration to enhance user experience. Research inquiry: Phenomenology study						
1. Informants: Architects - Professionals involved in designing spaces with sensory considerations. 2. Interior Designers - Experts in material selection and spatial aesthetics. 3. Urban Planners - Specialists in designing environments that incorporate sensory elements at a broader scale. 4. Building Users - Individuals who experience and interact with architectural spaces daily, including office workers, residents, and visitors. 5. Environmental Psychologists - Researchers focused on the impact of sensory perception in built environments.						
Research Questions	Deductive codes / Theories	Strategy of inquiry	Inductive codes			Emerging themes (Chapter 5)
			Coding	Category	Final Theme	
Sub RQ 1: What are the key sensory elements that influence user experience in architectural spaces	Key sensory elements User experience in architectural space	(triangulation) In-depth Interviews. Observations, Spatial analysis	Acoustics Aesthetics Ambiance Architecture Atmosphere Attention to detail Balancing Brand association Calming environment Color psychology Creative process Creativity Design Design preference Engagement Environmental design Environmental influence Evaluation Experience Expertise Functionality Healthcare design High productivity Innovative Lighting Memorability Mood regulation Natural vs. artificial lighting, brightness levels, and their impact on mood Noise pollution Passion Planning Sensory Sensory engagement Sensory experience Skill Stress reduction Testing User experience Wellness			

Once the initial codes are established, the next step is clustering these codes into categories. This stage involves comparing and contrasting different codes to identify relationships and patterns among them, leading to the creation of significant, overarching categories.

Table 3: Formulating categories from the codes for thematic analysis (TA)in TAM

Main RQ: How do sensory elements in architectural design influence user experiences, and how can they be systematically integrated into practice? Aim of research: To investigate the influence of sensory elements in architectural design and develop a framework for their systematic integration to enhance user experience. Research inquiry: Phenomenology study 1. Informants: Architects - Professionals involved in designing spaces with sensory considerations. 2. Interior Designers - Experts in material selection and spatial aesthetics. 3. Urban Planners - Specialists in designing environments that incorporate sensory elements at a broader scale. 4. Building Users - Individuals who experience and interact with architectural spaces daily, including office workers, residents, and visitors. 5. Environmental Psychologists - Researchers focused on the impact of sensory perception in built environments.						
Research Questions	Deductive codes / Theories	Strategy of inquiry	Inductive codes			Emerging themes (Chapter 5)
			Coding	Category	Final Theme	
Sub RQ 1: What are the key sensory elements that influence user experience in architectural spaces	Key sensory elements User experience in architectural space	(triangulation) In-depth Interviews. Observations, Spatial analysis	Acoustics Aesthetics Ambiance Architecture Atmosphere Attention to detail Balancing Brand association Calming environment Color psychology Creative process Creativity Design Design preference Engagement Environmental design Environmental influence Evaluation Experience Expertise Functionality Healthcare design High productivity Innovative Lighting Memorability Mood regulation Natural vs. artificial lighting, brightness levels, and their impact on mood Noise pollution Passion Planning Sensory Sensory engagement Sensory experience Skill Stress reduction Testing User experience Wellness	Cat 1A1: Environmental Design & Sensory Experience Acoustics Ambiance Atmosphere Environmental design Environmental influence Noise pollution Sensory engagement Sensory experience		
				Cat 1A2: Aesthetics & Mood Regulation Aesthetics Attention to detail Color psychology Lighting Mood regulation Natural vs. artificial lighting, brightness levels, and their impact on mood		
				Cat 1A3: Design thinking & creativity Creative process Creativity Design Design preference Innovative Planning		
				Cat 1A4: Functionality & user experience Architecture Functionality Healthcare design High-productivity User experience Wellness		
				Cat 1A5: Professional Expertise & Passion Evaluation Expertise Passion Skill Testing		
				Cat 1A6: Brand & Identity Perception Brand association Engagement Memorability		
				Cat 1A7: Psychological & emotional impact Balancing Calming environment Stress reduction		

Creating final themes in thematic analysis is a critical step in qualitative research that synthesizes findings from the comprehensive analysis of qualitative data. This process involves narrowing down initially identified themes to distinct, coherent narratives that respond to the research question and encapsulate the participants' experiences and perspectives. The successful formulation of final themes leverages iterative and reflective approaches to the thematic analysis process, which follows various stages outlined in the literature (table 4).

While emerging themes in thematic analysis often reveal unexpected patterns that can provide profound insights into the subject matter being studied. The systematic process of identifying, analyzing, and reporting these themes can lead to uncovering aspects of participants' experiences that were not anticipated at the outset. This analytical depth is essential in qualitative research, facilitating a comprehensive understanding of complex phenomena (table 4).

Table 4: Formulating Final themes and emerging themes for TA (thematic analysis)

Research Questions	Deductive codes / Theories	Strategy of inquiry	Inductive codes			Emerging themes (Chapter 5)
			Coding	Category	Final Theme	
Sub RQ 1: What are the key sensory elements that influence user experience in architectural spaces	Key sensory elements User experience in architectural space	(triangulation) In-depth Interviews. Observations, Spatial analysis	Acoustics Aesthetics Ambiance Architecture Atmosphere Attention to detail Balancing Brand association Calming environment Color psychology Creative process Creativity Design Design preference Engagement Environmental design Environmental influence Evaluation Experience Expertise Functionality Healthcare design High productivity Innovative Lighting Memorability Mood regulation Natural vs. artificial lighting, brightness levels, and their impact on mood Noise pollution Passion Planning Sensory Sensory engagement Sensory experience Skill Stress reduction Testing User experience Wellness	Cat 1A1: Environmental Design & Sensory Experience Acoustics Ambiance Atmosphere Environmental design Environmental influence Noise pollution Sensory engagement Sensory experience Cat 1A2: Aesthetics & Mood Regulation Aesthetics Attention to detail Color psychology Lighting Mood regulation Natural vs. artificial lighting, brightness levels, and their impact on mood Cat 1A3: Design thinking & creativity Creative process Creativity Design Design preference Innovative Planning Cat 1A4: Functionality & user experience Architecture Functionality Healthcare design High productivity User experience Wellness Cat 1A5: Professional Expertise & Passion Evaluation Expertise Passion Skill Testing Cat 1A6: Brand & Identity Perception Brand association Engagement Memorability Cat 1A7: Psychological & emotional impact Balancing Calming environment Stress reduction	Theme 1: Holistic Environmental & Emotional Design Cat: Environmental Design & Sensory Experience Cat: Aesthetics & Mood Regulation Theme 2: Innovation through Human-Centred Creativity Cat: Design Thinking & Creativity Cat: Functionality & User Experience Theme 3: Identity, Expertise & Professional Passion Cat: Professional Expertise & Passion Cat: Brand & Identity Perception Theme 4: Psychological Resonance & Well-being Cat: Psychological & Emotional Impact	ET1: Unconscious Influence of Space on Memory ET2: Emotional Triggers in Spatial Experience ET3: Cognitive Overload in Complex Spaces ET4: Personalization of Spatial Interpretation

Interpretivism and the Role of Deductive, Inductive, Final themes and Emerging Themes in Thematic Analysis

Interpretivism as a research paradigm prioritizes meaning making from human experiences rather than testing predefined theories. In qualitative research, particularly in phenomenological studies like the one on sensory perception in architectural experience, the importance of emerging themes is central. These themes are not pre-defined by existing theories but rather derive from participants' lived experiences, observations, and qualitative data analysis.

Distinction Between Deductive and Inductive Coding in Interpretivist Research

- **Deductive Coding** (Theory-Driven Approach): Involves pre-established theoretical frameworks guiding the coding process. In the Thematic Analysis Matrix (TAM) (table 2) provided, deductive codes were "Key sensory elements" and "User experience in architectural space." These codes were derived from literature and pre-existing sensory theories (e.g., Norberg-Schulz's phenomenology, Pallasmaa's multisensory design).
- **Inductive Coding** (Data-Driven Approach): Extracts new insights directly from the collected data. In this case, categories such as "Environmental Design & Sensory Experience" and "Aesthetics & Mood Regulation" emerged organically from qualitative inputs (interviews, observations, spatial analysis).

Developing the Final Framework from Established Themes

Once the key themes have been identified through thematic analysis, the next step is to synthesize these themes into a structured **final framework**. This framework serves as a tangible output that encapsulates the study's findings, offering a coherent representation of the relationships between identified themes and their implications.

Synthesizing Themes into a Conceptual Structure

Each established theme represents a core idea derived from the data. By analyzing how these themes interconnect, a **logical framework** can be formulated. This involves:

- Identifying patterns and relationships among themes.
- Grouping themes into broader conceptual categories.
- Establishing hierarchical connections between elements, if applicable.

Translating Themes into a Usable Framework

The framework should be structured to effectively convey the study's findings. This can take the form of:

- **A model** illustrating the interplay between themes.
- **A theoretical proposition** that explains phenomena derived from the research.
- **A design or implementation guideline**, particularly for applied research.
- **Ensuring Alignment with Research Objectives**

The final framework must align with the research objectives and questions. This ensures that:

- The framework directly addresses the study's aims.
- The final themes are mapped back to specific sub-research questions.
- The output is actionable and provides meaningful insights.

Visualizing the Framework

To enhance clarity, the framework can be represented through:

- Diagrams or flowcharts showing relationships among themes.
- A matrix linking themes to categories and subcategories.
- Conceptual models that highlight theoretical contributions.

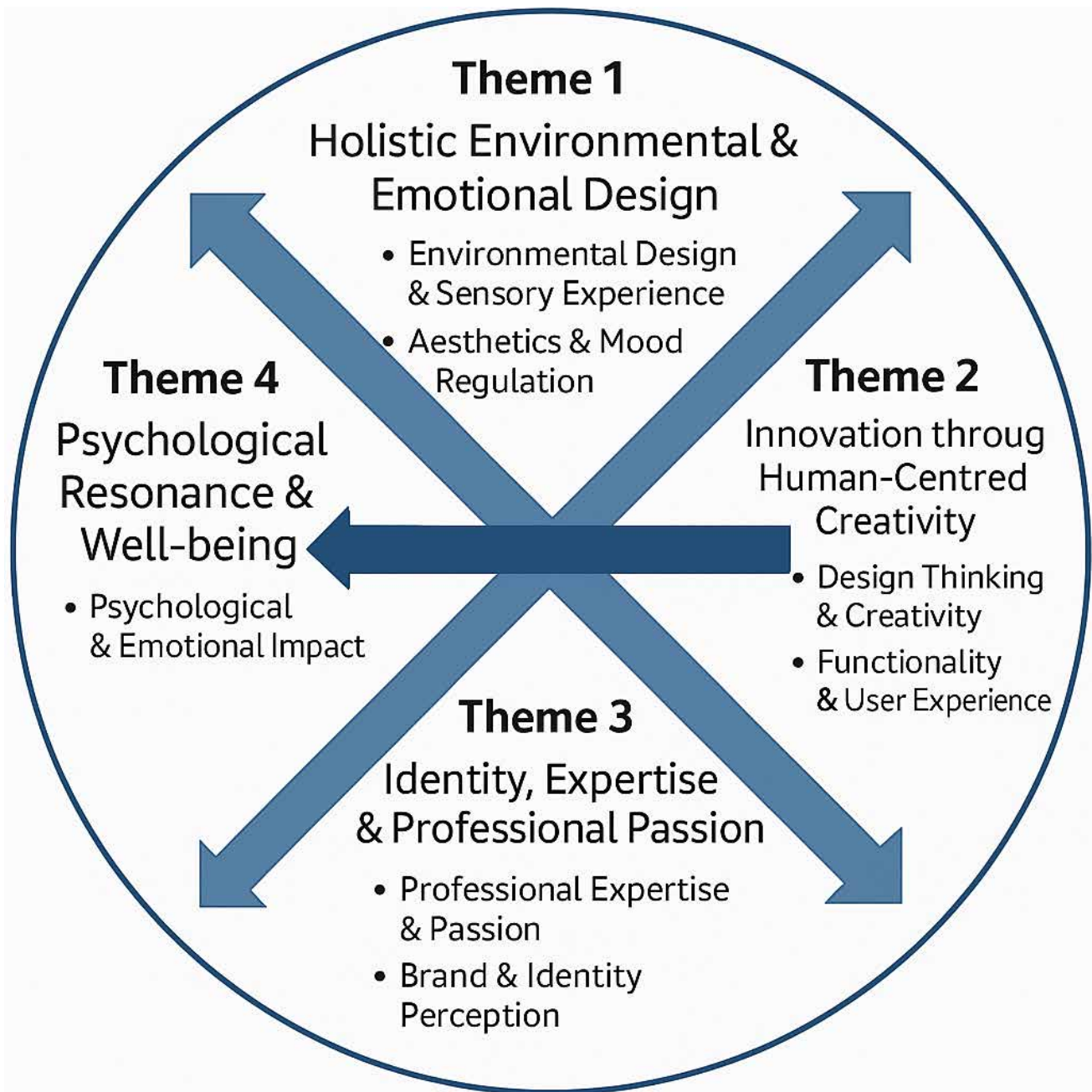


Figure 2: Visualizing the framework

Presenting Emerging Themes in the Final Chapter and Recommendations for Future Research

Integrating Emerging Themes in the Final Chapter

Emerging themes are insights that were not initially anticipated but surfaced through rigorous qualitative analysis. These themes provide new perspectives that may challenge or expand existing theoretical frameworks. To effectively present them in the final chapter, consider the following:

- **Contextualizing the Emerging Themes:** Explain how these themes surfaced during the analysis and why they are significant.
- **Linking to the Research Findings:** Show how they relate to the established themes and whether they reinforce or introduce new dimensions to the study.
- **Illustrating with Data:** Support each emerging theme with **direct quotes, observations, or patterns** identified in the dataset.
- **Discussing Theoretical Implications:** Analyze how these themes align with or deviate from existing literature, contributing to **new knowledge** in the field.

For example, if your study focuses on **sensory perception in architecture**, an emerging theme might be:

- *“Unexpected Emotional Triggers in Spatial Experience”* – Users reporting strong emotional connections to certain architectural elements not initially considered in the study.

Recommendations for Future Research

Emerging themes highlight **gaps** in the research and open avenues for further study. Recommendations should address:

- **Expanding the Scope:** Future research can explore whether these emerging themes are **generalizable** across different contexts, populations, or settings.
- **Methodological Refinements:** If the themes suggest **unexpected behavioral or psychological responses**, additional qualitative or mixed-method studies could deepen the understanding.
- **Theoretical Development:** The emerging themes may indicate the need for **new conceptual models or theoretical frameworks** to explain findings beyond existing literature.
- **Practical Applications:** In applied fields like architecture or design, findings can inform **guidelines, policies, or design strategies** for better user experience.

For example, if *emotional triggers in spatial experience* emerged unexpectedly, future studies could:

- Investigate the role of **cultural background in shaping sensory experiences**.
- Conduct longitudinal studies to see how spatial memories evolve over time.
- Explore **neuroscientific approaches** to validate sensory-emotional links in architecture.

The Fluidity of Emerging Themes in Qualitative Inquiry

Unlike positivist research, which aims for fixed hypotheses and measurable variables, interpretivist research embraces fluidity and subjectivity. Emerging themes may:

- Refine or challenge existing theoretical assumptions.
- Introduce new dimensions to understanding user experience in architecture.
- Capture overlooked or subconscious elements that designers may not have considered (e.g., the psychological impact of branding in spatial design).

Conclusion

The Thematic Analysis Matrix (TAM) offers a robust and structured approach to qualitative research, ensuring methodological rigor, transparency, and systematic reporting. By organizing qualitative data into inductive codes, categories, and final themes, TAM enhances the clarity and coherence of thematic analysis, particularly in architectural research. This study demonstrates how TAM effectively captures sensory perception in architectural experiences by identifying emerging themes that were not initially anticipated.

A key strength of TAM lies in its ability to integrate both deductive and inductive approaches, allowing for the validation of existing theories while uncovering novel insights through emergent themes. The interpretivist nature of TAM ensures that human experiences remain central to the research process, enabling a deeper understanding of spatial interactions. Additionally, the incorporation of data triangulation, through interviews, observational studies, and expert insights, reinforces the credibility and trustworthiness of findings.

As qualitative research continues to evolve, TAM stands as a valuable methodological tool that not only enhances analytical depth but also ensures replicability and transparency in qualitative inquiry. This structured approach is especially beneficial for researchers in architecture, environmental psychology, and user-centred design, as it bridges the gap between experiential data and theoretical frameworks. Moving forward, the refinement and wider application of TAM can further strengthen qualitative research methodologies, fostering richer, more insightful explorations of human experiences in built environments.

References

- AKŞİT, S., Yılmaz, E. B., DAĞ, R., AKSU, İ. A., ARSLAN, S., AKŞİT, S., & İKİZLER, H. C. (2023). Problems Faced by Students With Intellectual Disabilities in Their Participation in Sports Education: Parent Views. *Turkish Journal of Sport and Exercise*. <https://doi.org/10.15314/tсед.1379039>
- Ali, S., Ogden, J., & Birtel, M. D. (2017). Building a Dual Identity as an Immigrant in the UK: Eritreans' Search for Freedom and a Sense of Balance. *Ethnic and Racial Studies*. <https://doi.org/10.1080/01419870.2017.1384555>
- Askola, R., Soininen, P., & Seppänen, A. (2020). Offense-Related Issues in Forensic Psychiatric Treatment: A Thematic Analysis. *Frontiers in Psychiatry*. <https://doi.org/10.3389/fpsy.2019.00925>
- BAY, D. N. (2020). Examining the Plays That Preschool Children Prefer and the Characteristics Shaping Them Using Draw and Tell Technique. *European Journal of Educational Sciences*. <https://doi.org/10.19044/ejes.v7no2a7>
- Benton, M., Baykoca, J., Ismail, K., & Price, H. (2023). Healthcare Professionals' Experiences in Identifying and Supporting Mental Health Problems in Adults Living With Type 1 Diabetes Mellitus: A Qualitative Study. *Diabetic Medicine*. <https://doi.org/10.1111/dme.15103>
- Braun, V., & Clarke, V. (2020). One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology*. <https://doi.org/10.1080/14780887.2020.1769238>
- Braun, V., & Clarke, V. (2022a). Conceptual and design thinking for thematic analysis. *Qualitative Psychology*, 9(1), 3–26. <https://doi.org/10.1037/qup0000196>
- Braun, V., & Clarke, V. (2022b). Thematic Analysis: A Practical Guide. *QMIP Bulletin*, 1(33), 46–50. <https://doi.org/10.53841/bpsqmip.2022.1.33.46>
- Clarke, Braun., Braun, V. (2012). Thematic Coding and Analysis. *The SAGE Encyclopedia of Qualitative Research Methods*. <https://doi.org/10.4135/9781412963909.n451>
- Doğusan, S. N., & Koçak, F. (2021). Standing on the Ice: Experiences of Women National Ice Hockey Players in Turkey. *Physical Culture and Sport Studies and Research*. <https://doi.org/10.2478/pcssr-2021-0005>
- Drápal, J., Westermann, H., & Šavelka, J. (2023). *Using Large Language Models to Support Thematic Analysis in Empirical Legal Studies*. <https://doi.org/10.3233/faia230965>
- Du, Y., Dennis, B., Liu, J., Meyer, K., Siddiqui, N., Lopez, K., White, C. L., Myneni, S., Gonzales, M. M., & Wang, J. (2021). A Conceptual Model to Improve Care for Individuals With Alzheimer's Disease and Related Dementias and Their Caregivers: Qualitative Findings in an Online Caregiver Forum. *Journal of Alzheimer S Disease*. <https://doi.org/10.3233/jad-210167>
- Ejegi-Memeh, S., Robertson, S., Taylor, B. F., Darlison, L., & Tod, A. (2021). Gender and the Experiences of Living With Mesothelioma: A Thematic Analysis. *European Journal of Oncology Nursing*. <https://doi.org/10.1016/j.ejon.2021.101966>

- Ernstzen, D. (2013). Roles and Attributes of Physiotherapy Clinical Educators: Is There Agreement Between Educators and Students? *African Journal of Health Professions Education*. <https://doi.org/10.7196/ajhpe.252>
- Ernstzen, D., Louw, Q., & Hillier, S. (2016). Patient Perspectives About the Healthcare of Chronic Musculoskeletal Pain: Three Patient Cases. *African Journal of Disability*. <https://doi.org/10.4102/ajod.v5i1.216>
- Fiolet, R., Tarzia, L., Owen, R., Eccles, C., Nicholson, K., Owen, M., Fry, S., Knox, J., & Hegarty, K. (2019). Indigenous Perspectives on Help-Seeking for Family Violence: Voices From an Australian Community. *Journal of Interpersonal Violence*. <https://doi.org/10.1177/0886260519883861>
- García-Molina, I., & Cortés-Calvo, M. (2024). "Until I Had My Son, I Did Not Realise That These Characteristics Could Be Due to Autism": Motherhood and Family Experiences of Spanish Autistic Mothers. *Autism in Adulthood*. <https://doi.org/10.1089/aut.2023.0013>
- Grinshtain, Y., & Gibton, D. (2017). Responsibility, Authority, and Accountability in School-Based and Non-School-Based Management. *Journal of Educational Administration*. <https://doi.org/10.1108/jea-01-2017-0005>
- Hinic, K. (2021). Coping With the Unexpected in Childbirth: A Thematic Analysis. *The Journal of Perinatal Education*. <https://doi.org/10.1891/j-pe-d-20-00061>
- Kontrimienė, A., Blaževičienė, A., Liseckienė, I., Raila, G., Valius, L., & Jaruševičienė, L. (2020). *Partnership Between Primary Health and Social Care Services in the Long-Term Care of Older People With Dementia: A Vignette Study*. <https://doi.org/10.21203/rs.3.rs-44517/v1>
- Lee, V. V. (2024). Harnessing ChatGPT for Thematic Analysis: Are We Ready? *Journal of Medical Internet Research*. <https://doi.org/10.2196/54974>
- Mohd Zairul. (2023). *Memahami Asas Penyelidikan Kualitatif dan Analisis Tematik dengan ATLAS.ti 23* (Mohd Zairul, Ed.; 2nd ed.). Penerbit Universiti Pendidikan Sultan Idris.
- Mukona, D. M., Tsiko, B., & Zvinavashe, M. (2024). *Lived Experiences of Mothers With Peripartum Cardiomyopathy*. <https://doi.org/10.1101/2024.02.16.24302928>
- Peng, Y., Zhang, M., Wu, H., Mei, T., Zhou, T., & Huang, P. (2023). *Perceptions, Attitudes, and Behaviors of Bereavement Care in Emergency Department Staff: A Descriptive Qualitative Study*. <https://doi.org/10.21203/rs.3.rs-3261675/v1>
- R. Rosairo, H. S. (2023). Thematic Analysis in Qualitative Research. *Journal of Agricultural Sciences – Sri Lanka*. <https://doi.org/10.4038/jas.v18i3.10526>
- Sizoo, E. M., Monnier, A. A., Bloemen, M., Hertogh, C. M. P. M., & Smalbrugge, M. (2020). Dilemmas With Restrictive Visiting Policies in Dutch Nursing Homes During the COVID-19 Pandemic: A Qualitative Analysis of an Open-Ended Questionnaire With Elderly Care Physicians. *Journal of the American Medical Directors Association*. <https://doi.org/10.1016/j.jamda.2020.10.024>

- Suwanbamrung, C., & Kaewsawat, S. (2020). Public Health Students' Reflection Regarding the First Case of Coronavirus Disease 2019 in a University, Southern Thailand. *J Health Care and Research*. <https://doi.org/10.36502/2020/hcr.6177>
- Tambling, R. B., Tomkunas, A. J., Russell, B. S., Horton, A. L., & Hutchison, M. (2021). Thematic Analysis of Parent–Child Conversations About COVID-19: “Playing It Safe.” *Journal of Child and Family Studies*. <https://doi.org/10.1007/s10826-020-01889-w>
- Tangen, J. L., Fickling, M. J., & Cashwell, C. S. (2021). The Deep Student: A Thematic Analysis of Counsellor Educators' Perceptions and Experiences. *Counselling and Psychotherapy Research*. <https://doi.org/10.1002/capr.12511>
- Tata, V., Saadi, R. Al, Cho, S. K., Varisco, T. J., Wanat, M. A., & Thornton, J. D. (2023). Physician Perspective on the Implementation of Risk Mitigation Strategies When Prescribing Opioid Medications: A Qualitative Analysis. *BMC Health Services Research*. <https://doi.org/10.1186/s12913-023-10136-z>
- TRANKLE, S., USHERWOOD, T., ABBOTT, P., ROBERTS, M., CRAMPTON, M., GIRGIS, C. M., RISKALLAH, J., CHANG, Y., SAINI, J., & REATH, J. (2020). Key stakeholder experiences of an integrated healthcare pilot in Australia: A thematic analysis. *BMC Health Services Research*. <https://doi.org/10.21203/rs.2.24576/v1>
- Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content Analysis and Thematic Analysis: Implications for Conducting a Qualitative Descriptive Study. *Nursing and Health Sciences*. <https://doi.org/10.1111/nhs.12048>
- Wagner, M. L. (2023). Students' Perceptions of Instruction in Co-Teaching Classrooms: A Systematic Literature Review and Thematic Analysis. *Exceptional Children*. <https://doi.org/10.1177/00144029231220303>
- White, B. K., Ishizumi, A., Lavery, L. A., Wright, A., Foley, T., O'Neill, R., Rambaud, K., Sreenath, R. S., Salvi, C., Takahashi, R., D'Agostino, M., Nguyen, T., Briand, S., & Purnat, T. D. (2024). Expressions of Pandemic Fatigue on Digital Platforms: A Thematic Analysis of Sentiment and Narratives for Infodemic Insights. *BMC Public Health*. <https://doi.org/10.1186/s12889-024-17718-4>
- Zairul, M. (2021). *Ilustrasi Ringkas Analisa Tematik (AT) Menggunakan Perisian ATLAS.ti 8* (1st ed.). UPM Press.
- Zhou, M., Zhou, H., Zhang, X., Jin, X., Su, X., Bai, Y., Wei, W., Zhang, Y., & Ma, F. (2024). A Qualitative Study on Patients' and Health Care Professionals' Perspectives Regarding Care Delivered During CIED Operation. *BMC Health Services Research*. <https://doi.org/10.1186/s12913-024-10546-7>