A Typology of Intuition for Older Adults’ Interaction with Digital Interfaces: A Systematic Review and Reflexive Thematic Analysis

Abstract

Intuition is widely invoked in design and human–computer interaction (HCI) as a desirable quality of interfaces, yet it remains conceptually fragmented and is rarely specified for older adults, whose age-related changes make intuitive use both especially valuable and especially fragile. This study asks how intuition should be defined for older adults and which forms of intuition are most relevant to mitigating their interaction barriers. A systematic literature review was conducted following the PRISMA 2020 guidelines across Web of Science, PubMed, and the ACM Digital Library; eleven studies met the eligibility criteria and were synthesized through reflexive thematic analysis in MAXQDA 2024, with methodological quality appraised using the Mixed Methods Appraisal Tool (MMAT). The analysis produced five themes — the cognitive–experiential foundation of intuition, recognition and familiarity as interface mechanisms, contextual and cultural shaping, functional benefits, and age-related constraints — from which a four-part typology was derived: experiential, recognition-based, embodied, and contextual intuition. A theoretical definition of intuition for older adults is proposed, and experiential and recognition-based intuition appeared to be the most prominent types across the reviewed studies, given the relative preservation of crystallized knowledge in later life. Mapping the typology onto twenty previously identified interaction barriers indicates that intuition-oriented design has plausible leverage over the cognitive and design–interaction barriers that dominate older adults’ difficulties, while sensory, trust, and resource barriers require complementary measures. The typology offers designers a structured and theoretically informed resource for ageing-centered interface design.

Keywords: *intuitive interaction; intuitive design; design for ageing; human–computer interaction; reflexive thematic analysis.*

1. Introduction

Although intuition has been examined in product design for more than two decades, substantial gaps remain in the body of knowledge on the topic. When designers are asked to define intuition, they offer a wide range of explanations, reflecting the inherently ambiguous and elusive nature of the concept. Despite a growing, multidisciplinary literature, the field has been described as conceptually underdeveloped and scattered across disciplines and application domains, producing a fragmented knowledge base (Hodgkinson et al., 2008). This fragmentation is partly a consequence of intuition’s close association with unconscious processes, long regarded as inaccessible to systematic scientific investigation.

This conceptual ambiguity becomes problematic when intuition is translated into design practice, particularly in Human–Computer Interaction (HCI), where “intuitive interaction” and “intuitive use” are frequently invoked but inconsistently operationalized. Intuitive interaction involves applying knowledge gained from prior experience, whereas intuitive use refers to users’ ability to operate a system effectively without conscious effort or explicit instruction

(Blackler, 2006). Such interaction is typically enabled when interface elements align with users' prior knowledge, cultural conventions, and recognizable affordances (Norman, 2013).

Understanding how intuition operates in digital interaction becomes especially important for older adults. Population ageing and the pervasive digitalization of everyday services mean that older users increasingly depend on interfaces rarely designed with their experiential histories in mind. Because some analytic abilities decline with age while accumulated knowledge remains comparatively stable (Horn & Cattell, 1966; Park & Reuter-Lorenz, 2009), intuition — the rapid, experience-based activation of prior knowledge — is a potentially powerful resource for supporting interaction despite age-related cognitive changes. Yet intuitive use is also most vulnerable when cognitive resources are constrained and interface conventions are unfamiliar. Clarifying what intuition means for this population is therefore a prerequisite for any design strategy that seeks to enhance it. However, despite its apparent relevance, there remains little consensus regarding the nature of intuition in later life or the forms of intuition most relevant to older adults' digital interactions.

To address this gap, this study conducts a systematic literature review (SLR), synthesized through reflexive thematic analysis, to answer the following research question:

How is intuition defined and conceptualized in the context of older adults, and which intuition types are most relevant to mitigating their interaction barriers?

The study makes three contributions. First, it consolidates the fragmented literature into a coherent, ageing-specific conceptualization of intuition. Second, it derives a review-informed four-part typology of intuition for older adults. Third, it maps that typology onto a previously established taxonomy of twenty interaction barriers identified in an earlier phase of the present doctoral research programme (Authors, in review), thereby translating conceptual insights into preliminary design implications. The remainder reviews the conceptual background, details the review methodology and analysis, presents the thematic results and resulting typology, and discusses the theoretical definition, design implications, and limitations.

2. Conceptual Background

2.1 The Ambiguity of Intuition

Intuition is a fundamental yet contested notion across philosophy, psychology, cognitive science, and HCI. Despite its apparent simplicity in everyday language, scholars do not agree on what it means and approach it from divergent disciplinary traditions (Agor, 1989). In general terms, intuition refers to a process drawing on information previously perceived by the senses (Bastick, 1982), or to intelligent pattern recognition shaped by expertise and experience

(Hogarth, 2001). A range of terms — "gut feeling," "hunch," "right-brain thinking" — has been used interchangeably with it (Boucouvalas, 1997). Definitions emphasize, variously, knowing without being able to explain how one knows (Vaughan, 1979), reasoning without analytical method (Kahneman, 2011; Kahneman & Tversky, 1982), a feeling of certitude based on inadequate information and without conscious awareness of rational thinking (Shirley & Langan-Fox, 1996), subconscious knowledge acquired through extended practice (Norman, 1998), affect-laden "gut feelings" that precede reasoning (Haidt, 2001), and adaptive pattern recognition grounded in ecological rationality (Gigerenzer, 2007). These divergent accounts indicate that intuition denotes not a single mechanism but a family of processes that vary in origin, structure, and degree of conscious awareness — which contributes to its persistent difficulty of operationalization across disciplines.

2.2 Intuition as a Multidimensional Construct

Within dual-process frameworks, intuition is typically positioned as Type 1 processing — fast, automatic, associative, and minimally demanding of working memory — in contrast to slow, rule-based Type 2 reasoning (Evans & Stanovich, 2013; Kahneman, 2011). However, defining intuition by speed and automaticity alone risks circularity, since automaticity is shared by many cognitive operations, including habits and perceptual routines (Keren & Schul, 2009). A substantial tradition therefore reconceptualizes intuition as recognition-based processing grounded in expertise: in the recognition-primed decision model, experts rely on rapid pattern matching derived from extensive domain experience rather than comparative analysis, although intuitive accuracy depends on whether the environment provides structured feedback (Hogarth, 2001; Klein, 2017). Epistemological accounts add that much expert competence is tacit — "we know more than we can tell" — and enacted in practice rather than stated as rules (Polanyi, 2009), while affective and embodied theories hold that intuitive judgements are guided by bodily, affect-laden signals and grounded in sensorimotor experience (Barsalou, 2008; Damasio, 2004). Predictive-processing models integrate these strands by treating intuition as rapid, experience-based inference: recognition, emotional associations, and expertise are all forms of learned expectation that shape perception before deliberate reasoning unfolds (Clark, 2013).

Clarifying the construct of intuition also requires distinguishing it from adjacent constructs. More specifically, intuition is not instinct, which refers to biologically predetermined responses, because intuitive judgements are shaped by experiential learning (Gigerenzer, 2007); it is not guessing, because it is informed by implicit recognition (Klein, 2017); it is not habit, because it involves flexible adaptation to novel but structurally similar situations rather than fixed stimulus–response associations (Evans & Stanovich, 2013); and it is not equivalent to usability, since usability concerns measurable efficiency, effectiveness, and satisfaction, whereas intuition concerns the subjective experience of immediate comprehensibility grounded in prior schemas (Blackler, 2006). Taken together, these perspectives describe complementary dimensions rather than competing explanations: intuition can be understood as an experience-shaped, context-sensitive, and dynamically integrated process operating across perceptual, cognitive, and affective levels, characterized by reliance on accumulated experiential knowledge, partial or complete operation outside explicit deliberation, pattern recognition or holistic perception, and context-sensitive adaptation.

2.3 Intuition in Design and Human–Computer Interaction

Within HCI, these mechanisms acquire practical relevance because digital interfaces continually require users to interpret visual cues, anticipate system responses, and select actions under limited time and attention. Intuition in design is best treated not as a mystical capacity but as a relational phenomenon emerging from the fit between user experience and system configuration: empirically, intuitive interaction depends primarily on prior exposure rather than on inherent simplicity or formal instruction (Blackler et al., 2010). Three interconnected forms of familiarity are relevant — perceptual familiarity with recognizable visual arrangements, conceptual familiarity through metaphoric mappings to established schemas, and procedural familiarity with learned action sequences (Lakoff & Johnson, 1980; Norman, 2013; Sharp et al., 2019). Beyond surface recognition, intuitive interaction depends on conceptual coherence between system behavior and users' mental models (Johnson-Laird, 1995), and on embodied and environmental compatibility, whereby interaction techniques that mirror everyday bodily experience and stable interface conventions support recognition-based engagement (Barsalou, 2008; Gigerenzer, 2007; Hurtienne, 2009). Interfaces themselves do not possess "intuition"; rather, they facilitate or hinder the user's ability to recognize cues, activate prior knowledge, and predict system behavior (Norman, 2013).

2.4 Intuitive Use versus Usability and Learnability

Although related, intuitive use, usability, and learnability address different aspects of interaction. Usability concerns how effectively, efficiently, and satisfactorily users achieve goals within a context of use (International Organization for Standardization, 2018); learnability concerns how easily users acquire the knowledge needed to operate a system through practice or instruction (Nielsen, 1993); and intuitive use emphasizes the experience of immediate understanding based on knowledge acquired prior to, rather than during, interaction. A system may therefore be usable or learnable without being intuitive at first encounter. Because efficient performance can result from learning rather than from immediate recognition, studies of intuitive interaction typically focus on first-time use and on the extent to which existing experience enables users to operate a system without explicit instruction (Hurtienne & Blessing, 2007).

2.5 Intuition and Ageing

In the context of ageing, intuition becomes increasingly important as a mechanism that may support interaction despite cognitive limitations. Its relationship to ageing is closely tied to preserved experiential knowledge: while fluid intelligence, which involves processing novel information, tends to decline, crystallized intelligence — accumulated knowledge and expertise — remains comparatively stable and can provide a compensatory advantage (Horn & Cattell, 1966; Park & Reuter-Lorenz, 2009). Older adults may therefore rely more heavily on familiar interaction patterns, established mental models, and prior technological experience. When interfaces align with that prior knowledge, interaction can require less working memory and reduced analytic effort; conversely, unfamiliar gestures, abstract metaphors, or inconsistent structures reduce intuitive use and increase cognitive demand (Blackler et al., 2010; Hurtienne & Blessing, 2007). Intuition in older adulthood is thus a context-dependent phenomenon emerging from the interplay of cognitive ageing, prior experience, and interface characteristics — a framing that motivates the systematic review reported below.

3. Research Methodology

To address the research question, a systematic literature review was conducted and synthesized using reflexive thematic analysis in accordance with the PRISMA 2020 statement (Page et al., 2021). Epistemologically, the review was situated within an interpretivist, qualitative-configurative paradigm: it adopted a configurative rather than aggregative logic, aiming not to estimate effect sizes but to interpret how intuition is conceptualized and operationalized in studies involving older adults and digital interfaces. An a priori protocol specifying the search strategy, eligibility criteria, screening process, data extraction, quality appraisal, and analysis plan was developed and documented to ensure transparency and auditability. The resulting analytical findings were subsequently mapped against an established taxonomy of interaction barriers to support an integrated interpretation.

3.1 Search Strategy

Three complementary bibliographic databases were searched to balance disciplinary coverage across the health sciences, computing, and the social and behavioral sciences: Web of Science (WoS), PubMed, and the ACM Digital Library. Searches were executed on 10–11 October 2025 and restricted to peer-reviewed work published between 2015 and 2025 in English. A single Boolean string combining an intuition concept block with an ageing concept block, selected in alignment with the research questions, was adapted to each database's field syntax:

("intuition" OR "intuition definition*" OR "type* of intuition*" OR "intuitive use" OR "intuitive interaction" OR "intuitive interface") AND ("older adult*" OR "elderly user*" OR "older user*")*

Truncation (*) captured morphological variants. Search fields differed by platform (Topic in WoS; Title/Abstract in PubMed; Anywhere in the ACM Digital Library), and platform filters were applied for publication year, language, and — in the ACM Digital Library — research-article content type. Table 1 documents the per-database yield.

Table 1

Per-Database Search Documentation for the Intuition Systematic Review

Database	Search field	Date	Initial results	After filters	Filters applied
Web of Science	Topic	10 Oct 2025	180	140	2015–2025; English
PubMed	Title/Abstract	10 Oct 2025	29	23	2015–2025; English
ACM Digital Library	Anywhere	11 Oct 2025	199	44	2015–2025; English; research articles
Total	—	—	**408**	**207**	—

Note. Records identified and retained after the application of automated platform filters.

3.2 Eligibility Criteria and Study Selection

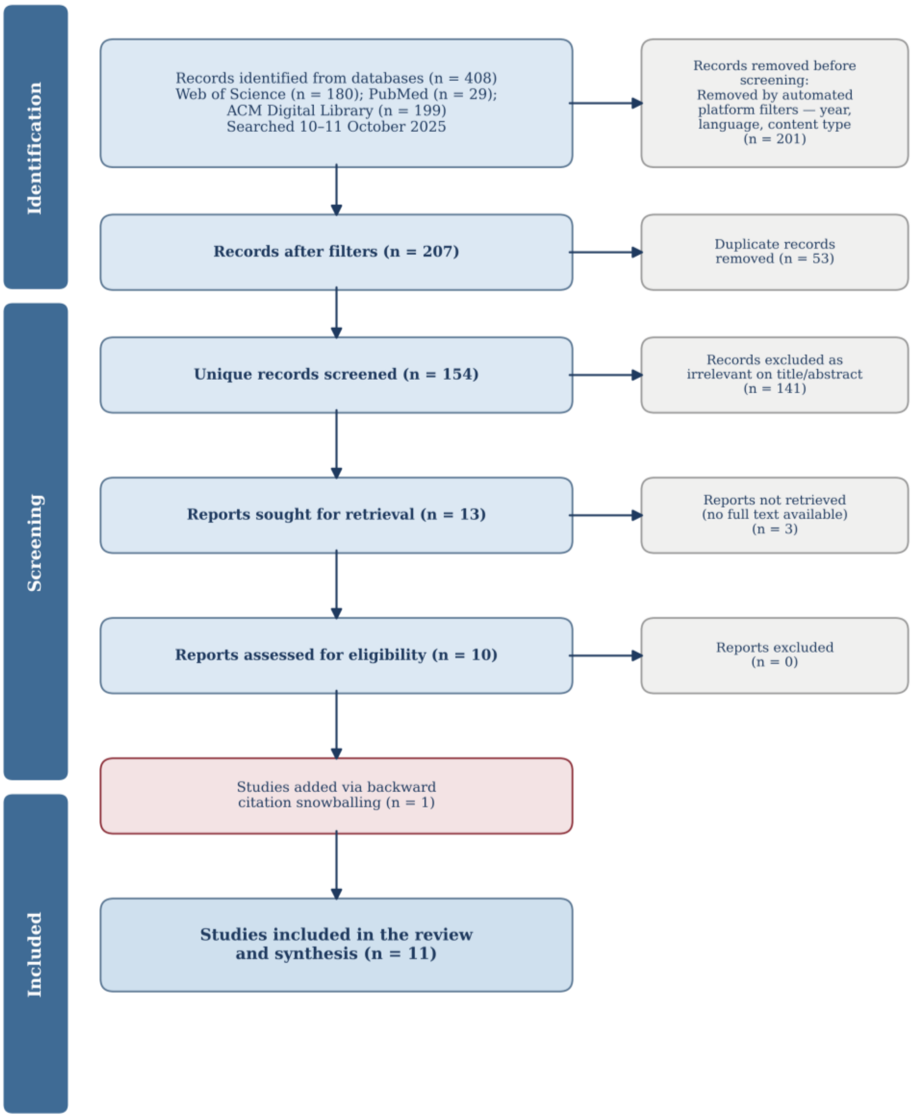
Studies were eligible if they were peer-reviewed journal articles, book chapters, or substantial conference papers (≥6 pages), published in English between 2015 and 2025, and explicitly addressed intuition, intuitive use, or intuitive interaction through a definition, typology, operationalization, or measurement of intuition. Two complementary source categories were included: (i) primary studies examining intuitive interaction with digital interfaces or interactive products; and (ii) foundational cognitive, cultural, or conceptual studies relevant to intuition in interface use or ageing populations, considered as contextual rather than confirmatory evidence. Studies were required to either include older adults as participants or address the implications of intuition for ageing populations. Non-peer-reviewed sources, studies unrelated to interface use or intuition in ageing, and short abstracts or posters were excluded.

The search identified 408 records across three databases, which were reduced to 207 after automated filtering and 154 after duplicate removal. Title and abstract screening excluded 141 records, leaving 13 reports for full-text assessment. Three reports could not be retrieved; the remaining 10 met eligibility criteria and passed quality appraisal. Backward citation searching identified one additional eligible study, resulting in a final corpus of eleven studies (Figure 1). Of these, seven directly examined intuitive interaction with specific interfaces, while four (A03, A04, A10, A11) addressed the cognitive, cultural, and ethical foundations of intuition and contributed as contextual evidence to the experiential and contextual dimensions of the typology.

The first author conducted the screening and selection process in Rayyan platform, while full-text eligibility decisions and the final inclusion list were reviewed and confirmed by the remaining authors to reduce potential single-reviewer selection bias.

Figure 1

PRISMA flow diagram



Note. Flow diagram of the identification, screening, and inclusion of studies. Adapted from the PRISMA 2020 statement (Page et al., 2021).

3.3 Data Extraction

A structured data-extraction form was used to capture study characteristics, including design, sample, interaction domain, conceptualization of intuition, and key findings relevant to older adults (Table 2). The eleven included studies encompassed diverse methodologies and domains, ranging from usability evaluations and cognitive experiments to field studies, conceptual analyses, and systematic reviews of digital interfaces, products, assistive technologies, and reasoning tasks.

Table 2

Data-Extraction Matrix of the Eleven Included Studies

ID	Study (author, year)	Type & sample	Interface / domain	Conceptualisation of intuition	Key findings & relevance to older adults
A01	Chen & Liu (2017)	Quasi-experimental usability test; older adults with dementia	Microwave-oven UI (domestic appliance)	Affordance-based; intuition as rapid, subconscious use of inherent knowledge and experience	Simple layouts were optimal; cognitive affordances that match users' knowledge induce intuitive operation, while complex, association-heavy layouts should be avoided.
A02	Lawry, Popovic, Blackler & Thompson (2019)	Mixed methods; two studies, 32 participants across four age groups each	Contemporary consumer products	Familiarity- and prior-experience-based intuition	Older adults are less familiar with contemporary products and use them less intuitively; familiarity is an essential element of intuitive interaction.
A03	Hertzog, Smith & Ariel (2018)	Quantitative non-randomised; younger vs. older adults (60–80)	Cognitive Reflection Test (numerical reasoning)	Intuition as Type-1 rapid, heuristic processing within a dual-process account	The apparent Type-1 tendency in older adults is partly confounded with numeracy; intuitive vs. analytic styles must be interpreted cautiously in ageing samples.
A04	Vandemeulebroucke, Dierckx de Casterlé & Gastmans (2020)	Conceptual; socio-historical, philosophical–ethical essay	Socially assistive robots (SARs) in aged care	Ethical intuition as a pre-theoretical belief or attitude functioning as a source of knowledge	Older adults' and caregivers' intuitions are legitimate sources of ethical knowledge that should inform the design and governance of care technologies.
A05	Mihajlov, Law & Springett (2015)	Within-subjects experiment; 17 technology-naïve older adults	Interactive tabletop touch games (gestural input)	Intuition as the natural learnability of touch gestures grounded in prior experience	The drag gesture was highly learnable and transferable; rotate was far less so. Gesture intuitiveness cannot be assumed and must be evaluated empirically.
A06	Ellis & Marshall (2019)	Mixed methods (SUS + observation + interviews); 15 older adults (plus 17 younger, validation)	Online-banking interface (flat vs. skeuomorphic prototypes)	Metaphor-/skeuomorphism-based intuition via familiar real-world cues	Older adults preferred the flat interface; skeuomorphism showed only limited potential and benefited older users more than younger ones.
A07	Bong, Chen & Bergland (2018)	Systematic literature review	Tangible user interfaces (TUIs) for social interaction	Embodied/tangible naturalness; intuition from coupling physical objects with digital information	TUIs may offer more natural and intuitive interaction for older adults and lower cognitive and physical effort, though empirical evidence remains scarce.

A08	Zhang, Miao, Wu, Tao & Shen (2019)	Field study; 44 Singaporean older adults, five weeks	Ping-Pong exergame (motion-based game)	Familiarity-based intuition supporting adaptation	Higher familiarity with the underlying activity (table tennis) predicted greater motivation and ability, mitigating maladaptation to the exergame.
A09	Reddy, Blackler, Popovic, Thompson & Mahar(2020)	Quasi-experimental; older (65+) vs. younger users	Device interfaces (words-based, symbols-based, redundant)	Intuition as prior-knowledge-driven, low-effort use	Older users were slower overall but found the simple words-based interface easiest and most intuitive; redundancy helped only users with moderate-to-high technology familiarity.
A10	Na, Huang & Park (2017)	Experiment; younger and older adults, US and Singapore	Categorisation task (typicality manipulation)	Cultural/holistic intuition and the typicality effect	Expected cultural differences in intuitive reasoning emerged only among older adults, indicating that ageing amplifies culturally shaped intuition when resources are limited.
A11	Shtulman & Harrington (2016)	Experiment (speeded verification); 104 younger + 48 older adults, including scientists	Verification of science statements consistent vs. inconsistent with intuition (10 domains)	Intuition as persistent naïve/folk theories that coexist with, and interfere with, scientific knowledge	Older adults were as accurate as younger adults but slower to reject intuition-inconsistent statements; naïve intuitions persist across the lifespan, even among experts.

Note. Identifiers A01–A11 correspond to the document IDs used in the MAXQDA 24 analysis. Bibliographic details and study designs were verified against the full text of each included source.

3.4 Quality Appraisal

Because the corpus comprised quantitative non-randomized, mixed-methods, conceptual–ethical, and review studies, methodological quality was appraised with the Mixed Methods Appraisal Tool (MMAT), version 2018 (Hong et al., 2018). The MMAT was preferred to a single design-specific instrument because it provides one validated framework capable of appraising heterogeneous empirical designs, applying two screening questions to all empirical studies and five category-specific criteria according to each study's design. Of the eleven studies, nine reported primary empirical data and were appraised with the relevant MMAT category — seven quantitative non-randomized studies (A01, A03, A05, A08, A09, A10, A11) and two mixed-methods studies (A02, A06). The remaining two fall outside the tool's scope: A07 is a systematic review and A04 a conceptual philosophical–ethical analysis; these were appraised separately for conceptual rigor and relevance and treated as contextual rather than confirmatory evidence.

Consistent with published MMAT guidance, the tool was used to characterize methodological quality rather than as an exclusion gate, and criterion ratings were not converted into an overall numerical score (Hong et al., 2018). No study was excluded on quality grounds; instead, the appraisal informed the interpretive weighting of evidence during synthesis, so that methodologically stronger empirical studies carried greater confirmatory weight while conceptually rich but non-empirical sources framed and contextualized the themes. Table 3 reports the design classification, the two screening outcomes (S1, S2), the category-specific criterion ratings (C1–C5) for the nine empirical studies, and the resulting descriptive quality profile.

Table 3
Design Classification and MMAT Appraisal of the Eleven Included Studies

ID	Design classification	S1	S2	Route	C1–C5	Quality profile
A01	Quantitative non-randomized (quasi-experimental usability test)	Y	Y	MMAT 3.x	CT·Y·CT·CT·Y	Moderate (small clinical sample; some method detail unverifiable)
A02	Mixed methods (coded protocol + quantitative familiarity measures)	Y	Y	MMAT 5.x	Y·Y·Y·CT·Y	High
A03	Quantitative non-randomized (age-group comparison)	Y	Y	MMAT 3.x	Y·Y·CT·CT·Y	Moderate–High
A04	Conceptual / philosophical–ethical essay	Y	—	N/A	—	Conceptual (contextual evidence)
A05	Quantitative non-randomized (within-subjects gesture study)	Y	Y	MMAT 3.x	Y·Y·Y·CT·Y	High
A06	Mixed methods (comparative usability evaluation)	Y	Y	MMAT 5.x	Y·Y·Y·CT·CT	Moderate–High
A07	Systematic literature review	Y	—	N/A	—	Review (contextual evidence)
A08	Quantitative non-randomized (five-week field study)	Y	Y	MMAT 3.x	Y·Y·CT·CT·Y	Moderate–High (five-week attrition unverifiable)
A09	Quantitative non-randomized (quasi-experimental)	Y	Y	MMAT 3.x	Y·Y·Y·Y·Y	High
A10	Quantitative non-randomized (experimental categorization task)	Y	Y	MMAT 3.x	Y·Y·Y·CT·Y	High
A11	Quantitative non-randomized (speeded-verification experiment)	Y	Y	MMAT 3.x	Y·Y·Y·CT·Y	High

Note. S1 = clear research questions; S2 = collected data allow the research questions to be addressed. For quantitative non-randomized studies (3.x), C1–C5 = representativeness; appropriate measurements; complete outcome data; confounders accounted for; intervention/exposure as intended. For mixed-methods studies (5.x), C1–C5 = rationale for the design; effective integration of components; adequate interpretation of integration; divergences addressed; adherence to each tradition's quality criteria. Y = Yes; CT = Can't tell; "—" = non-empirical study, outside MMAT scope. Profiles are descriptive rather than summed scores, following MMAT guidance.

4. Data Analysis: Reflexive Thematic Analysis

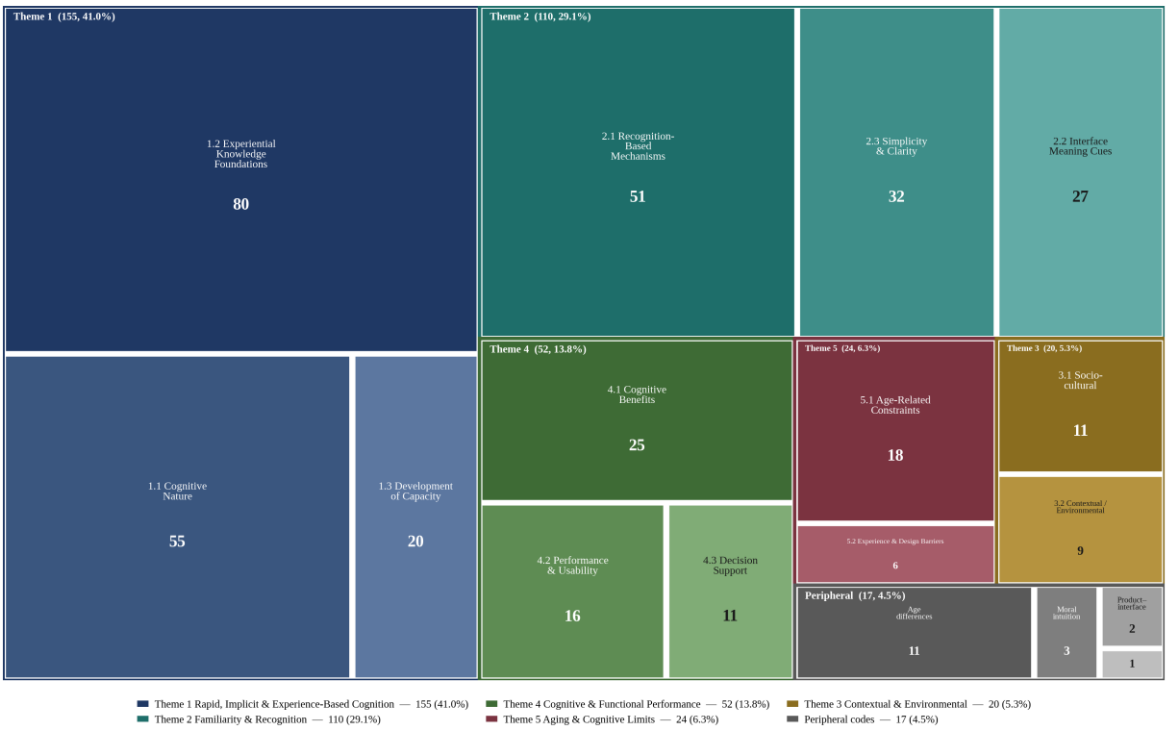
The eleven included studies were synthesized using reflexive thematic analysis (RTA) following Braun and Clarke (2006, 2021, 2023). RTA was selected due to the interpretive nature of the review, which aimed to develop a coherent conceptualization of intuition in older adults from heterogeneous evidence rather than aggregate comparable outcomes. An inductive, data-driven coding approach was adopted, with themes understood as analytic constructions developed through engagement between the data and the research question. The previously established twenty-barrier taxonomy (Authors, in review) was intentionally withheld during coding and introduced only during the subsequent mapping stage to minimize the risk of imposing an a priori analytical structure.

4.1 Analytic Procedure and Software-Assisted Coding

The analysis followed Braun and Clarke’s (2006) six phases of reflexive thematic analysis: familiarization, initial coding, theme development, review, definition, and reporting. Coding was conducted in MAXQDA 2024, with the eleven studies imported as separate documents (A01–A11). A structured codebook was developed containing code labels, operational definitions, and coding rules to enhance transparency and auditability (Braun & Clarke, 2006; MacQueen et al., 1998; Saldaña, 2021; Nowell et al., 2017). The final coding framework consisted of five themes, thirteen subthemes, and thirty-six lower-order codes, with four peripheral codes retained for transparency. Overall, 378 segments were coded, including 361 segments (95.5%) across the five main themes and 17 segments (4.5%) within peripheral codes (Figure 2).

Figure 2

Hierarchical distribution of coded segments across themes and subthemes (N = 378)



Note. The area of each block is proportional to the number of coded segments; counts are shown on each tile. Block areas reflect analytic salience rather than effect magnitude (Braun & Clarke, 2021).

To make the basis of interpretation explicit, the codebook reports two complementary indicators for every code — the segment frequency (f), indicating how often a conceptualization was articulated, and the number of source studies in which the code appeared (“Sources,” out of 11), indicating its dispersion across the evidence base. Reporting dispersion alongside frequency guards against over-reading codes whose counts are driven by a single prolific source (Nowell et al., 2017). Throughout, segment counts are interpreted as indicators of analytic salience and patterning rather than as measures of effect magnitude (Braun & Clarke, 2021). Table 4 presents the complete codebook.

Table 4
The Final Coding Framework (Codebook): Themes, Subthemes, and Codes with Definitions, Segment Frequencies (f), and Source Dispersion

Code	Operational definition / coding rule	f	Sources
Theme 1 — Intuition as Rapid, Implicit, and Experience-Based Cognition	*Intuition as a rapid, implicit, experience-dependent cognitive process grounded in accumulated experiential knowledge and prior exposure; recognition-based cognition operating with limited conscious deliberation.*	**155**	—
1.1 Cognitive Nature of Intuition	*What intuition is, cognitively.*	**55**	
Intuition as a cognitive process	Segments framing intuition explicitly as a distinct mode of cognition (e.g., Type-1 / System-1) rather than emotion, guessing, or chance.	5	4/11
Rapid cognitive processing	Segments emphasizing the speed and immediacy of intuitive judgement — conclusions reached with little deliberation or elapsed time.	29	7/11
Unconscious cognitive processing	Segments describing intuition as operating below conscious awareness, automatically and without deliberate, reportable reasoning.	21	8/11
1.2 Experiential Knowledge Foundations	*What intuition is built upon.*	**80**	
Natural processes are intuitive	Segments treating bodily, perceptual, or ecologically "natural" mappings and actions as inherently intuitive without prior training.	5	2/11
Crystallized intelligence supports intuition	Segments linking intuition to accumulated, age-stable crystallized knowledge and semantic resources.	1	1/11
Prior knowledge shapes intuition	Segments attributing intuitive use to pre-existing domain or world knowledge transferred to a new interaction.	36	9/11
Experience shapes intuition	Segments attributing intuitive capacity to accumulated prior experience with similar tasks, tools, or interfaces.	38	10/11
1.3 Development of Intuitive Capacity	*How intuition develops over time.*	**20**	
Experience fosters familiarity	Segments describing how repeated exposure gradually builds the familiarity on which later intuitive use depends.	15	2/11
Learning and knowledge acquisition shape intuitive interaction	Segments describing deliberate learning or training as a route through which interactions later become intuitive.	5	2/11
Theme 2 — Familiarity and Recognition as Core Mechanisms of Intuitive Interaction	*Intuitive interaction as a recognition-driven process facilitated by familiar interface cues, predictable interaction patterns, and expectation-consistent design elements aligned with users' mental models.*	**110**	—
2.1 Recognition-Based Mechanisms	*Recognition and expectation matching.*	**51**	
Typicality effect influences intuition	Segments where conformity to a typical or prototypical exemplar increases intuitive recognition and use.	3	1/11
User expectations guide intuitive interaction	Segments where interaction is intuitive because the interface behaves consistently with users' expectations.	3	1/11
Familiarity enables intuitive interaction	Segments where prior familiarity with features, layouts, or conventions directly enables intuitive use.	45	6/11
2.2 Interface Meaning Cues	*Interface elements that communicate meaning.*	**27**	
Recognizable interface features support intuitive interaction	Segments where identifiable, conventional UI elements (icons, buttons) convey their function on sight.	7	3/11
Metaphors support intuitive interaction	Segments where real-world metaphors map interface meaning onto users' prior knowledge.	8	3/11
Affordances support intuitive interaction $^{+}$	Segments where perceived affordances (including ergonomic stereotypes) signal possible actions without instruction.	12	3/11
2.3 Cognitive Simplicity and Clarity	*Reducing interpretation effort.*	**32**	
Consistency supports intuitive interaction	Segments where internal or external consistency of the interface reduces interpretive effort.	1	1/11
Simplicity facilitates intuitive interaction $^{+}$	Segments where simple, uncluttered layout or structure lowers the threshold for intuitive use.	14	6/11
Redundancy supports intuitive interaction	Segments where redundant cues (multiple coding of the same information) aid intuitive comprehension.	7	2/11

Text-based interfaces facilitate intuitive interaction	Segments where explicit textual labelling supports intuitive understanding, particularly for older users.	10	1/11
Theme 3 — Contextual and Environmental Factors Shape Intuition	*Intuition as context-sensitive and shaped by environmental, cultural, and situational conditions rather than as a universal or fixed cognitive phenomenon.*	**20**	—
3.1 Sociocultural Influences	*Personal and cultural characteristics.*	**11**	
Cultural values shape intuitive judgements +	Segments where cultural background or values condition what is perceived as intuitive.	8	2/11
Individual variability of intuition	Segments emphasizing person-to-person variation in intuitive response.	3	2/11
3.2 Contextual and Environmental Influences	*External and situational factors.*	**9**	
Environmental factors influence intuition +	Segments where the physical or situational environment conditions intuitive perception and action.	7	3/11
Context influences intuition	Segments where the task or use context alters what counts as intuitive.	2	1/11
Theme 4 — Intuitive Interaction Enhances Cognitive and Functional Performance	*Intuitive interaction as functionally beneficial, reducing cognitive effort and improving interaction effectiveness, usability, and decision support.*	**52**	—
4.1 Cognitive Benefits	*Reductions in cognitive load and barriers.*	**25**	
Intuition enhances learnability	Segments where intuitive design shortens or eases the learning of an interface or task.	9	5/11
Intuitive interaction reduces cognitive barriers	Segments where intuitive use removes or lowers cognitive obstacles to interaction.	6	5/11
Intuitive interaction reduces working-memory demands	Segments where intuitive design lowers working-memory load during use.	10	7/11
4.2 Performance and Usability Outcomes	*Effects on usability, efficiency, and accuracy.*	**16**	
Lack of intuition contributes to usability problems	Disconfirming case: segments where the absence of intuitiveness is linked to usability failures.	1	1/11
Intuitive interaction improves efficiency and accuracy	Segments where intuitive use improves task speed and/or correctness.	4	3/11
Intuitive interaction enhances usability	Segments where intuitiveness is associated with overall usability gains.	11	5/11
4.3 Decision Support Functions	*Support for judgement and problem-solving.*	**11**	
Intuition supports decision-making	Segments where intuition aids judgement or choice during interaction.	10	4/11
Intuition supports problem-solving	Segments where intuition contributes to resolving interaction problems.	1	1/11
Theme 5 — Aging and Cognitive Limitations Constrain Intuitive Interaction	*Intuitive interaction as vulnerable to age-related cognitive limitation, reduced cognitive resources, insufficient experiential familiarity, and interface complexity.*	**24**	—
5.1 Age-Related Cognitive Constraints	*Cognitive limits associated with ageing.*	**18**	
Limited cognitive resources constrain intuitive processing	Segments where reduced cognitive resources limit intuitive processing.	4	2/11
Age-related cognitive decline constrains intuitive interaction +	Segments where age-linked decline (including memory decline) hinders intuitive use.	10	5/11
Aging constrains intuitive interaction	Segments where ageing per se is associated with reduced intuitive interaction.	4	3/11
5.2 Experience and Design Barriers	*Experiential and interface-related barriers.*	**6**	
Lack of experience hinders intuitive interaction	Segments where insufficient prior experience undermines intuitive use.	1	1/11
Complex interfaces hinder intuitive interaction	Segments where interface complexity blocks intuitive use.	5	4/11
Peripheral / Weakly Relevant Codes	*Codes with limited conceptual relevance to the central analytical dimensions of the research question, retained for analytical transparency and completeness.*	**17**	—
Age differences in intuitive interaction	Segments noting age-group differences without contributing to the core analytical dimensions.	11	6/11
Moral intuition	Segments referring to moral/ethical intuition, outside the HCI focus of the review.	3	1/11
Intuition in product–interface interaction	Segments on intuition in non-digital product interaction, peripheral to the digital-interface focus.	2	1/11
Racial differences influence intuition	Segments referencing racial differences, marginal to the research question.	1	1/11

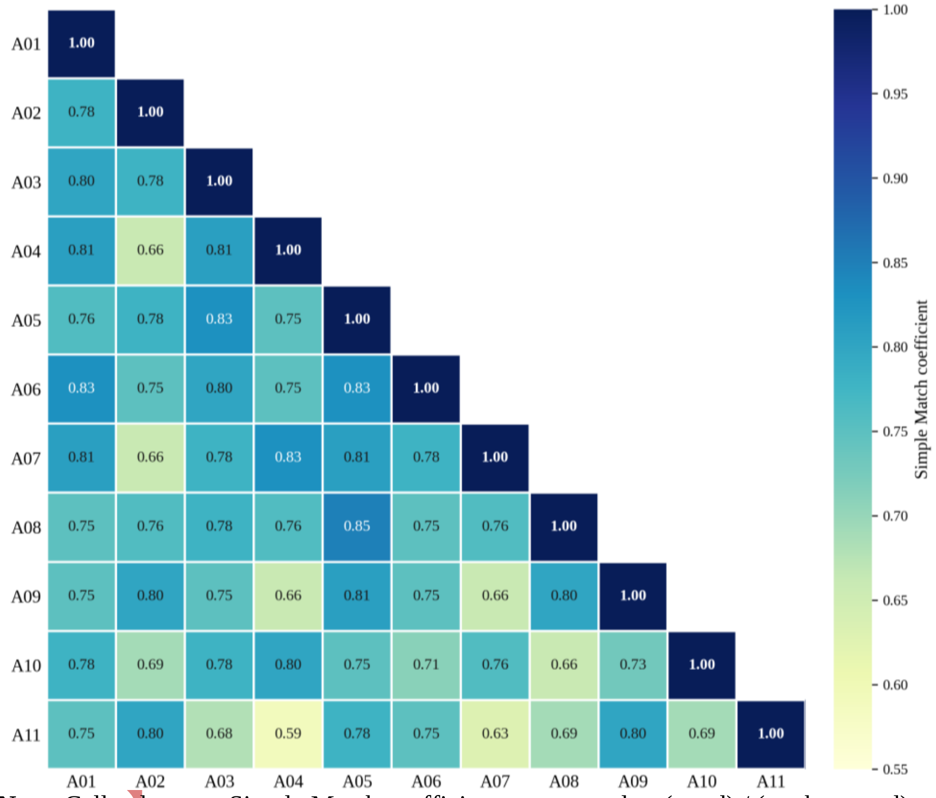
Note. f = number of coded segments; Sources = number of included studies (out of 11) in which the code appeared. Theme- and subtheme-level f values are totals of their constituent codes. + denotes codes consolidated during refinement. Coding was conducted in MAXQDA 24; figures are drawn from the Code System, Code Matrix Browser, and Subcode Statistics outputs.

4.2 Credibility, Consistency, and Trustworthiness

Following the reflexive approach to thematic analysis, coding was conducted by a single analyst, with interpretation considered an analytical resource rather than a bias (Braun & Clarke, 2021). The codebook and thematic structure were reviewed by a three-member expert panel to enhance credibility and refine analytical boundaries. A coding similarity analysis in MAXQDA 2024 was used to assess coherence across sources rather than coder reliability, as presented in Figure 3 (O'Connor & Joffe, 2020). Trustworthiness was addressed through credibility, transferability, dependability, and confirmability criteria, supported by expert review and an audit trail (Lincoln & Guba, 1985; Nowell et al., 2017).

Figure 3

Pairwise Coding-Similarity Across the Eleven Included Studies (Simple Match Coefficients)



Note. Cell values are Simple Match coefficients, computed as (a + d) / (a + b + c + d), where a = codes present in both articles, d = codes absent from both, and b and c = codes present in only one article. Coefficients were computed in MAXQDA 24 for all pairwise combinations of the 11 included studies (A01–A11). Higher values indicate greater thematic overlap in coded content. Because the matrix is symmetric, only the lower triangle is shown; diagonal values equal 1.00 by definition

5. Results: Themes and Subthemes

The reflexive thematic analysis produced five analytic themes describing what intuition is, how it operates, what conditions shape it, what it achieves, and what constrains it, together with a peripheral cluster retained for transparency. The five themes may be interpreted as forming a

coherent conceptual chain: a cognitive–experiential foundation (Theme 1) is enacted through recognition mechanisms at the interface (Theme 2), conditioned by context and culture (Theme 3), yielding cognitive and functional benefits (Theme 4), while ageing and limited resources can constrain the whole process (Theme 5). Table 5 summarizes the themes, their subthemes, coded-segment frequencies, and the number of supporting studies. Throughout, segment frequencies are reported as indicators of analytic salience rather than as statistical estimates.
Segment frequencies (f) and study frequencies (k) were recorded to improve transparency regarding the prevalence and distribution of patterns across the reviewed literature. Consistent with Reflexive Thematic Analysis, these indicators were used descriptively rather than as measures of analytical importance. Theme development and interpretation were guided primarily by conceptual coherence, explanatory relevance, and contribution to addressing the research questions, rather than by numerical prevalence alone.

Table 5
Themes, Subthemes, Coded-Segment Frequencies, and Number of Supporting Studies

Theme / Subtheme	Segments	% of theme	Studies (k)
Theme 1 — Intuition as Rapid, Implicit, and Experience-Based Cognition	**155**	—	**11**
1.1 Cognitive Nature of Intuition	55	35.5	8
1.2 Experiential Knowledge Foundations	80	51.6	11
1.3 Development of Intuitive Capacity	20	12.9	4
Theme 2 — Familiarity and Recognition as Core Mechanisms	**110**	—	**9**
2.1 Recognition-Based Mechanisms	51	46.4	7
2.2 Interface Meaning Cues	27	24.5	5
2.3 Cognitive Simplicity and Clarity	32	29.1	6
Theme 3 — Contextual and Environmental Factors Shape Intuition	**20**	—	**5**
3.1 Sociocultural Influences	11	55.0	4
3.2 Contextual and Environmental Influences	9	45.0	3
Theme 4 — Intuitive Interaction Enhances Cognitive and Functional Performance	**52**	—	**10**
4.1 Cognitive Benefits	25	48.1	9
4.2 Performance and Usability Outcomes	16	30.8	6
4.3 Decision Support Functions	11	21.2	4
Theme 5 — Aging and Cognitive Limitations Constrain Intuitive Interaction	**24**	—	**6**
5.1 Age-Related Cognitive Constraints	18	75.0	5
5.2 Experience and Design Barriers	6	25.0	5
Peripheral / Weakly Relevant Codes	**17**	—	**8**

Note. Percentages are within-theme shares of subtheme segments. Total analytic segments = 378; peripheral segments = 17; k = number of supporting studies out of 11.

5.1 Theme 1 — Intuition as Rapid, Implicit, and Experience-Based Cognition

This theme conceptualizes intuition as a rapid, implicit, and experience-dependent cognitive process grounded in accumulated experiential knowledge and prior exposure, in which previously acquired patterns are automatically activated with limited conscious deliberation; it establishes that intuition is not random or irrational but rooted in experiential knowledge and implicit processing. It was the most prominent theme (155 segments) and the only one evidenced by all eleven studies (k = 11). The subtheme Cognitive Nature of Intuition (55 segments) characterizes intuition as fast and largely automatic, with one study noting that *"intuitive interaction is fast and generally non-conscious"* and that participants "would often have low verbalization levels when processing intuitively" (A02; Lawry et al., 2019). The subtheme Experiential Knowledge Foundations (80 segments, the single largest subtheme) grounds this cognition in experience: intuition "does not simply rely on instinct and innateness, but … depends on experiential knowledge accrued over time" (A05; Mihajlov et al., 2015), and "the intuitive use of an interface involves the non-conscious use of prior knowledge" (A09; Reddy et al., 2020); it was also linked to preserved ability in later life, with older adults reported to "perform well on some tests of numerical ability, often considered an aspect of crystallized intelligence" (A03; Hertzog et al., 2018). The subtheme Development of Intuitive Capacity (20 segments) frames intuition as cultivated over time, since "being familiar with a system means we are ready to operate it … based on our prior experiences" (A08; Zhang et al., 2019).

5.2 Theme 2 — Familiarity and Recognition as Core Mechanisms of Intuitive Interaction

This theme conceptualizes intuitive interaction as a recognition-driven process facilitated by familiar interface cues, predictable interaction patterns, and expectation-consistent design, which becomes operational when interface structures align with users' existing mental models and previously encountered conventions, thereby reducing interpretive effort. The second most prominent theme (110 segments; k = 9), it translates the cognitive foundation of Theme 1 into concrete interface mechanisms. The subtheme Recognition-Based Mechanisms (51 segments) is dominated by familiarity, described as "the backbone of intuitive interaction" (A09; Reddy et al., 2020), and shaped by typicality, since "East Asians are more susceptible to the typicality effect than Americans" (A10; Na et al., 2017). The subtheme Interface Meaning Cues (27 segments) specifies how interfaces communicate meaning — through affordances, since "the original theory of affordance mainly concerns the intuitive relationship between an organism and an object" (A01; Chen & Liu, 2017); through metaphors, provided "the metaphors chosen are familiar to their specific target users" (A06; Ellis & Marshall, 2019); and through recognizable features. The subtheme Cognitive Simplicity and Clarity (32 segments) assembles strategies that lower interpretive load — simplicity, text-based presentation, redundancy, and consistency — noting that “a simple text-based interface was much more helpful for older people than a redundant interface” (A09; Reddy et al., 2020).

5.3 Theme 3 — Contextual and Environmental Factors Shape Intuition

This theme conceptualizes intuition as context-sensitive and shaped by environmental, cultural, and situational conditions rather than as a universal or fixed phenomenon — particularly consequential for older adults whose histories may differ markedly from those of younger users. Although the smallest analytic theme (20 segments; k = 5), it qualifies the generality of intuition. The subtheme Sociocultural Influences (11 segments) shows that culture conditions intuitive judgement, with the prediction that “the association between cultural values and reasoning would be moderated by cognitive function” (A10; (Na et al., 2017)) and the observation that “intuitions are always personal and colored by the socio-technical, political and historical environments in which we live” (A04; Vandemeulebroucke et al., 2020). The subtheme Contextual and Environmental Influences (9 segments) locates intuition within its situation, arguing that intuitions “do not come out of the blue and are at least influenced by the socio-historical context in which they occur” (A04; Vandemeulebroucke et al., 2020).

5.4 Theme 4 — Intuitive Interaction Enhances Cognitive and Functional Performance

This theme conceptualizes intuitive interaction as functionally beneficial, reducing cognitive effort and improving interaction effectiveness, usability, and decision-making; it captures the consequences of intuitive interaction rather than its nature or mechanisms. The second most broadly supported theme (52 segments; k = 10), it suggests broad agreement across the reviewed studies that intuition is valued because of its functional consequences. The subtheme Cognitive Benefits (25 segments) links intuition to reduced processing demands — “familiarity is thought to be an unconscious, automatic process that demands minimal attention” (A08; Zhang et al., 2019) — to learnability, since “an intuitive interaction … should allow users to interact with the system without requiring training” (A06; Ellis & Marshall, 2019), and to the lowering of cognitive barriers (A05; Mihajlov et al., 2015). The subtheme Performance and Usability Outcomes (16 segments) connects intuition to usability directly, with the definitional claim that “a technical system is intuitively usable if the user’s subconscious application of prior knowledge leads to effective interaction” (A02; Lawry et al., 2019). The subtheme Decision Support Functions (11 segments) extends these benefits to judgement, arguing that “intuitions form the first pillar on which the decision-making process … should be built” (A04; (Vandemeulebroucke et al., 2020)).

5.5 Theme 5 — Aging and Cognitive Limitations Constrain Intuitive Interaction

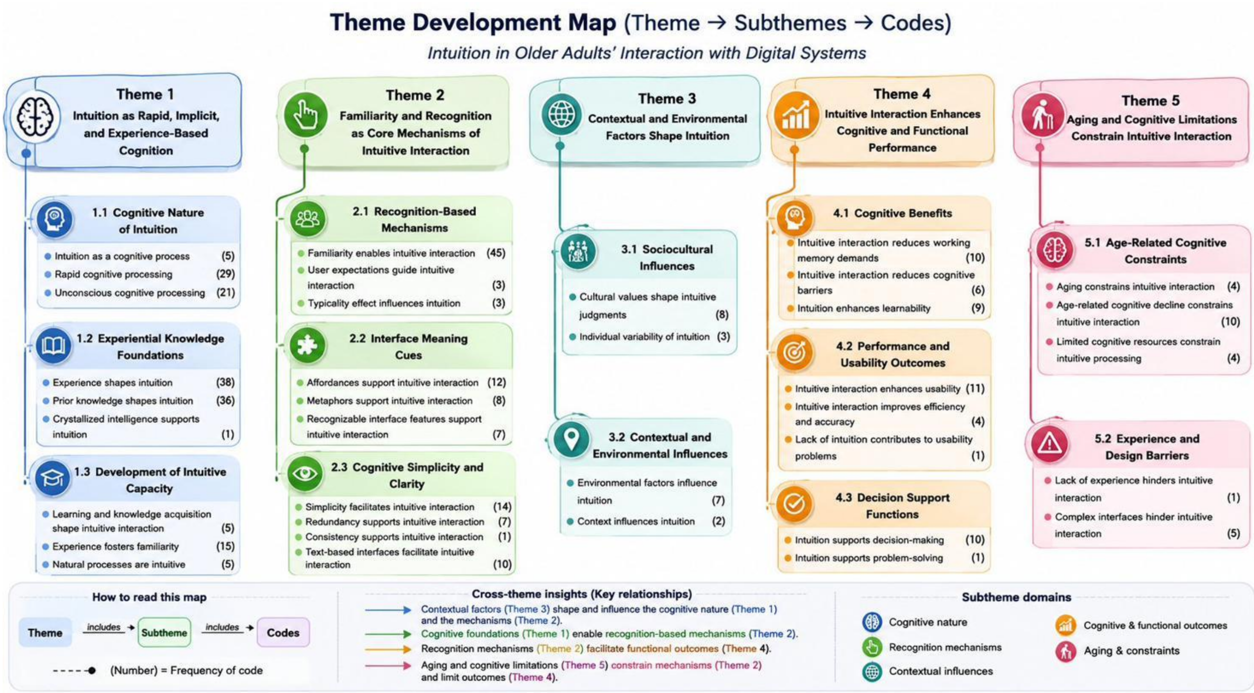
This theme conceptualizes intuitive interaction as vulnerable to age-related cognitive limitations, reduced cognitive resources, and insufficient experiential familiarity, explaining why intuitive use may break down under cognitive decline, limited capacity, unfamiliarity, or interface complexity (24 segments; k = 6). The subtheme Age-Related Cognitive Constraints (18 segments) reports that ageing depresses intuitive performance, since older people "took more time to complete the tasks, and used the interfaces less intuitively" and "cognitive ability and prior experience are important factors that will decide the effectiveness of … intuitive use" (A09; (Reddy et al., 2020)). The subtheme Experience and Design Barriers (6 segments) ties breakdown to design and exposure, advising that "complex arrangements and information presentations that require imaginative association should be avoided when designing interfaces" (A01; (Chen & Liu, 2017)). Read against Theme 4, this theme frames the central design tension: intuition is most valuable for older adults precisely where age-related constraints make it most fragile.

5.6 Peripheral Codes and Thematic Structure

Seventeen segments were assigned to four peripheral codes retained for transparency: age differences in intuitive interaction (11 segments), moral intuition (3; A04), intuition in product–interface interaction (2; A02), and racial differences (1; A10). Judged to lie at the margins of the research question, they were excluded from the core typology.

The hierarchical development of the theme structure, from codes to subthemes to themes, is shown in Figure 4, and the final conceptual model relating the five themes as a single explanatory system is shown in Figure 5. In that model, contextual and environmental factors (Theme 3) underpin the experiential foundation of intuition (Theme 1), which grounds the recognition mechanisms at the interface (Theme 2); these mechanisms generate the cognitive and functional benefits of intuitive interaction (Theme 4), while ageing and cognitive limitations (Theme 5) impair recognition and constrain those benefits.

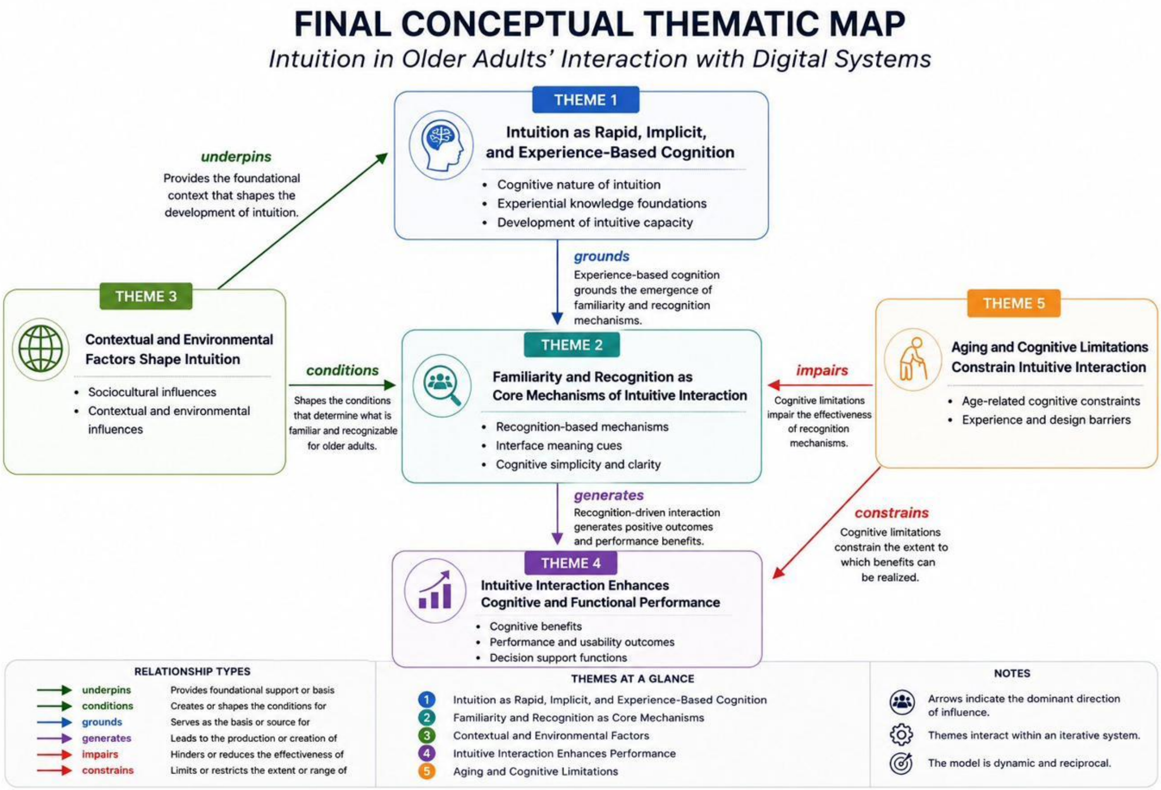
Figure 4
Theme Development Map



Note. Hierarchical development of the theme structure (themes → subthemes → codes) with coded-segment frequencies.

Figure 5

Final Conceptual Thematic Map



Note. Final conceptual model of intuition for older adults, showing the explanatory relations among the five themes.

6. A Proposed Typology of Intuition for Older Adults

Synthesizing the five themes, four functionally distinct yet interrelated types of intuition were derived. The typology was constructed by treating Theme 1 as the cognitive foundation common to all types, and Themes 2 and 3 as specifying the mechanisms and conditions that differentiate them; Theme 4 supplies the functional outcomes shared across types, and Theme 5 the constraints under which they operate. The synthesis suggests four analytically distinct types and provides a rationale for their conceptual ordering: experiential intuition is foundational rather than parallel, and affordance-based intuition is best understood as one member of a broader embodied–metaphorical family. Table 6 defines each type, identifies its grounding theme and supporting studies, and states its relevance to older adults.

The number of intuition types was not predetermined. Instead, it emerged from the analytical structure of the reflexive thematic analysis. Among the five themes, only Themes 1–3 represented distinct conceptual dimensions of intuition itself. Theme 4 described the functional consequences of intuitive interaction, whereas Theme 5 captured the conditions constraining intuitive interaction. Furthermore, Theme 2 contained two conceptually independent interface-level mechanisms—recognition-based processing and embodied/affordance-based processing—which warranted separation into distinct intuition types. Consequently, the synthesis resulted in four theoretically distinct intuition types rather than three or five. Each intuition type represents an abstraction grounded explicitly in one or more themes identified through reflexive thematic analysis.

Table 6

Proposed Typology of Intuition for Older Adults

Type	Definition	Grounding theme	Supporting studies (k)	Relevance to older adults
IT-1 Experiential Intuition	Rapid, non-conscious activation of accumulated experiential and crystallized knowledge during interaction.	Theme 1 (esp. 1.2)	A01–A11 (k = 11)	Most consistently represented type across the reviewed literature on ageing: draws on preserved crystallized knowledge, partially offsetting fluid-ability decline.
IT-2 Recognition-Based Intuition	Triggering of intuitive use when interface cues match prior conventions, expectations, and mental models.	Theme 2.1 (with 1.2)	A02, A05, A06, A08, A09, A10, A11 (k = 7)	Frequently associated with positive interaction outcomes in the reviewed studies: familiar patterns and metaphors compensate for reduced learning of novel conventions.
IT-3 Embodied Intuition	Intuition cued by perceptible affordances, real-world metaphors, and embodied/tangible coupling of action and meaning.	Theme 2.2 (with 2.3)	A01, A02, A06, A07, A11 (k = 5)	Supports perception–action mapping and lowers sensory–motor and learning demands via concrete, body-based cues.
IT-4 Contextual Intuition	Intuitive judgements shaped by cultural values, situational context, and environmental framing.	Theme 3	A04, A08, A10, A11 (k = 4)	Acts as a moderator: some evidence suggests that ageing may increase reliance on culturally shaped intuitive

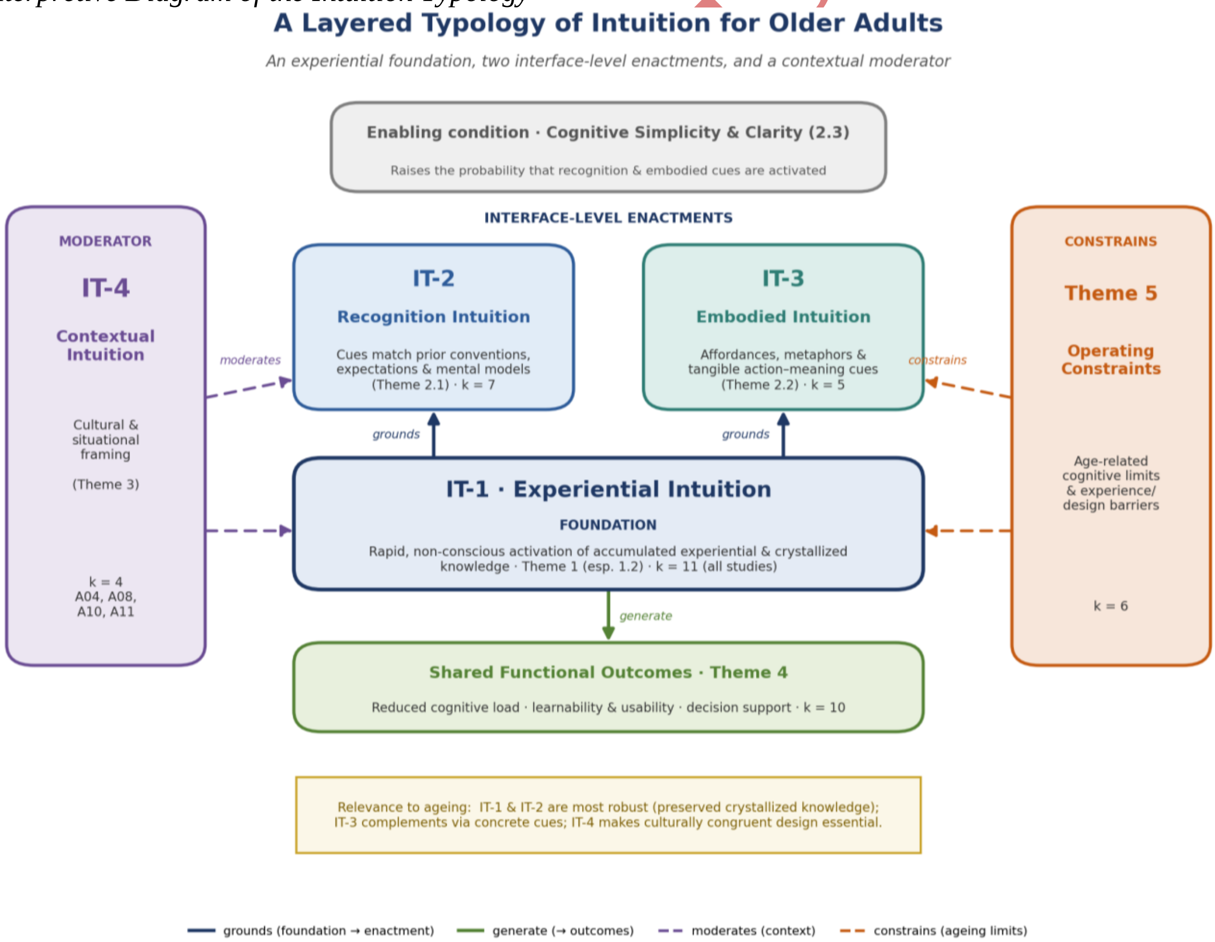
				processes, so culturally congruent design is especially important.

Note. Supporting-study sets are derived from the MAXQDA 24 Code Matrix Browser. Cognitive simplicity and clarity (Subtheme 2.3) functions as an enabling condition across IT-2 and IT-3; Theme 4 supplies shared functional outcomes and Theme 5 the operating constraints.

Two cross-cutting elements complete the typology. First, cognitive simplicity and clarity (Subtheme 2.3) is not a separate type but an enabling condition that raises the probability that recognition- and affordance-based intuition will be triggered, especially under the resource constraints described in Theme 5. Second, the functional benefits in Theme 4 are outcomes common to all four types rather than a distinct form of intuition. The typology is therefore layered: IT-1 is foundational, IT-2 and IT-3 are interface-level enactments of that foundation, and IT-4 is a contextual moderator (Figure 6), with IT-1 and IT-2 carrying the greatest relevance for older adults because they draw on comparatively preserved crystallized knowledge.

Figure 6

Interpretive Diagram of the Intuition Typology



Note. A layered interpretive model of the four-part typology of intuition for older adults. Experiential intuition (IT-1) is the foundation that grounds the two interface-level enactments — recognition-based (IT-2) and embodied (IT-3) intuition — which in turn generate the shared functional outcomes of Theme 4. Cognitive simplicity and clarity (Subtheme 2.3) acts as an enabling condition, contextual/sociocultural intuition (IT-4) as a moderator, and the age-related limitations of Theme 5 as operating constraints. Arrow types denote the relations grounds, generate, moderates, and constrains; k values are the number of supporting studies (of 11), derived from the MAXQDA 24 Code Matrix Browser.

6.1 Mapping the Typology to the Twenty Interaction Barriers

To establish the applied relevance of the typology, the four intuition types were mapped onto a taxonomy of twenty interaction barriers that older adults encounter with digital interfaces, derived in an earlier phase of the broader doctoral research programme (Authors, in review) through a large-scale qualitative coding exercise (total N = 3,640 coded segments); the barrier frequencies in Table 7 are reproduced from that work. For each barrier, the mapping identifies the intuition type(s) whose mechanism most directly targets the underlying cause and rates the mitigation potential as High (intuition targets the causal mechanism), Moderate (partial or indirect leverage), Low (marginal leverage), or None (sensory–structural or resource-based, outside the reach of intuitive design).

Table 7

Interpretive Mapping of the Twenty Interaction Barriers to the Intuition Typology

Code	Barrier	n (%)	Primary type(s)	Mitigation mechanism	Potential
COG	Cognitive Load & Memory Demand	708 (19.4)	IT-1, IT-2	Recognition of familiar, experience-based patterns offloads working memory and reduces deliberation.	High
INF	Information Overload / Density	90 (2.5)	IT-2 + simplicity	Simplicity/clarity and recognisable structure reduce density and channel attention.	High
FAM	Familiarity with Interfaces	115 (3.2)	IT-2, IT-1	The barrier is the inverse of recognition-based intuition; familiar conventions resolve it directly.	High
NAV	Navigation Issues	213 (5.8)	IT-2, IT-3	Expectation-consistent layouts and affordances signal where functions are and how to proceed.	High
DST	Distractions & Interruptions	6 (0.2)	simplicity (IT-2)	Simplicity reduces interruptive elements, but distraction is largely an attentional/structural issue.	Low
VIS	Visual Barriers	501 (13.8)	IT-3	Affordance/metaphor cues aid perception, yet acuity/contrast limits are sensory and need ergonomic fixes.	Moderate
MOT	Motor / Physical Interaction	381 (10.5)	IT-3 (embodied)	Embodied/tangible mappings ease action selection; motor limits still require physical-design solutions.	Moderate
AUD	Auditory Limitations	134 (3.7)	—	Sensory barrier; addressed by multimodal/assistive design, not by intuitive cognition.	None
HPT	Haptic Sensory Barrier	62 (1.7)	IT-3 (partial)	Embodied coupling can leverage tactile cues, but tactile sensitivity loss is sensory.	Low
GUD	Graphical UI Design Issues	338 (9.3)	IT-2, IT-3	Recognisable, affordance-rich, consistent layouts are the direct design expression of intuitive interaction.	High
FDBK	Feedback, Help & Error Recovery	234 (6.4)	IT-2	Expectation-consistent, recognisable feedback supports error recovery; some help functions remain explicit.	High/Mod.
PRF	Personalization & Flexibility	80 (2.2)	IT-1 (adaptable)	Adaptable interfaces tuned to a user's prior knowledge align the system with experiential intuition.	Moderate

TAL	Task Alignment	23 (0.6)	IT-1, IT-2	Matching task flow to users' experiential logic and expectations reduces mismatch.	Moderate
MOTV	Emotional Frustration & Anxiety	299 (8.2)	IT-1/IT-2 (indirect)	Easier, recognisable interaction lowers failure and frustration; emotional response is mediated, not direct.	Moderate
NAS	Need for Assistance / Dependence	152 (4.2)	IT-1, IT-2, IT-3	Self-evident, intuitive operation reduces reliance on others by enabling independent use.	High
TRU	Trust, Security & Privacy Concerns	201 (5.5)	IT-2 (weak)	Familiar, predictable design can foster comfort, but trust depends mainly on security/transparency factors.	Low
CON	Content, Language & Terminology	64 (1.8)	IT-2 + text-based	Recognisable wording and simple text-based labelling reduce terminology barriers.	High/Mod.
CUL	Cultural Misalignment	13 (0.4)	IT-4	Culturally congruent symbols and workflows are the direct remedy, matching contextual intuition.	High
GEN	General Technical Barriers	7 (0.2)	—	Infrastructural (performance, connectivity); outside the scope of intuitive design.	None
FIN	Financial Barriers	19 (0.5)	—	Structural/economic; not addressable through interface intuition.	None

Note. Values of n (%) are reproduced from an earlier phase of the doctoral research programme (Authors, in review) (total N = 3,640 coded segments). Potential: High = intuition targets the causal mechanism; Moderate = partial/indirect; Low = marginal; None = sensory–structural/resource.

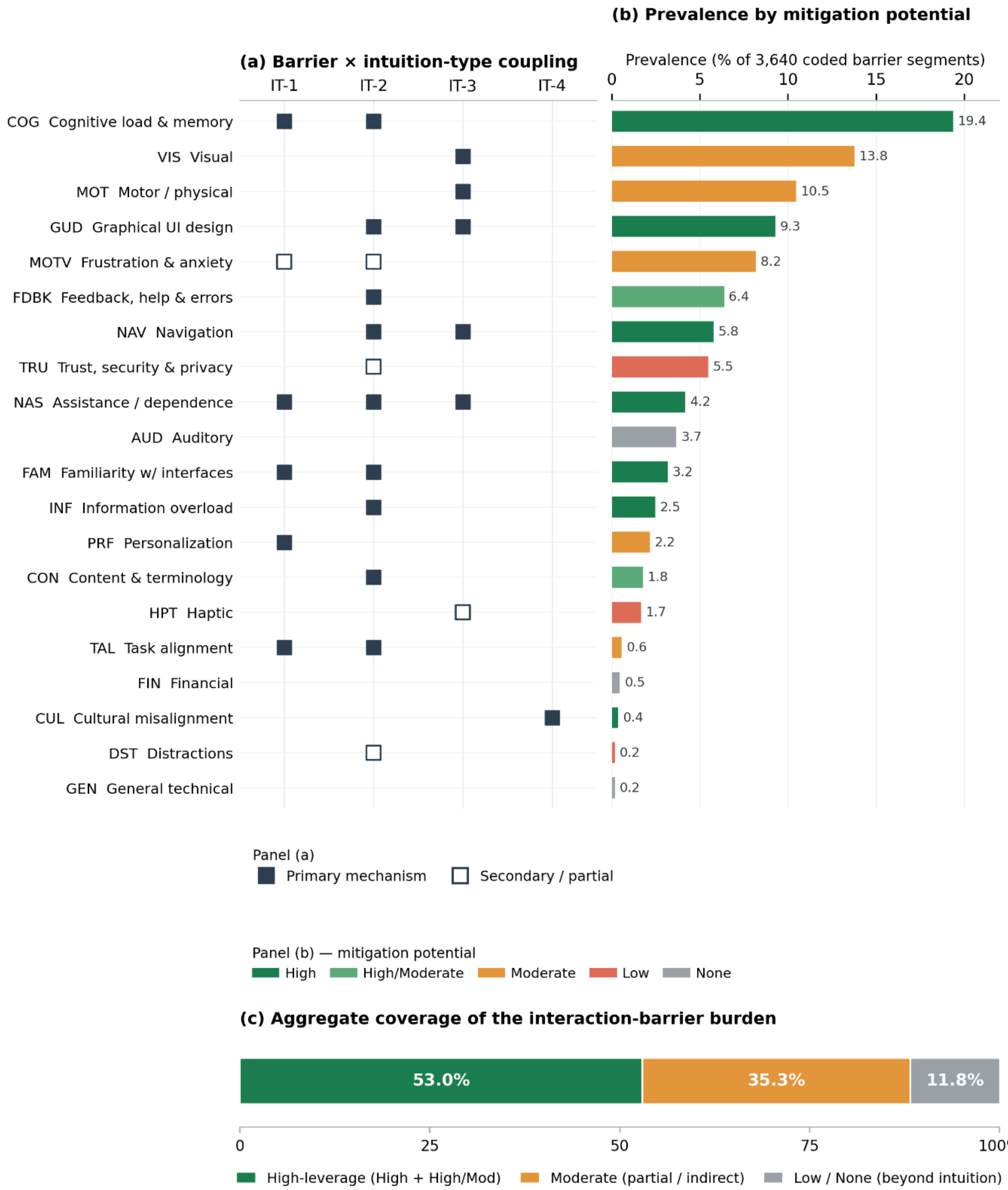
The mapping of intuition types reveals distinct roles for each mechanism. **Recognition-based intuition (IT-2)** serves as the framework's core, addressing the widest range of cognitive and informational barriers. **Experiential intuition (IT-1)** acts as a primary supplement for barriers involving familiarity and prior experience, while **Embodied intuition (IT-3)** focuses on perception, navigation, and physical interaction. **Cultural intuition (IT-4)** is specialized for cultural barriers. Notably, auditory, general technical, and financial barriers remain unaddressed, as they stem from structural or sensory conditions rather than intuitive processes (Figure 7a).

By weighting barrier prevalence against mitigation potential, design priorities become clear. Several high-frequency barriers are highly amenable to intuitive design: Cognitive Load (19.4%), Graphical UI Design (9.3%), and Navigation (5.8%) fall into the High-potential band, with Feedback (6.4%) showing High/Moderate potential. Conversely, prevalent Visual (13.8%) and Motor (10.5%) barriers are only moderately addressable, highlighting a need for complementary ergonomic and accessibility measures (Figure 7b).

In aggregate, barriers whose causal mechanism intuitive design directly targets — those rated High or High/Moderate — account for **approximately 53%** of the total barrier burden (44.8% and 8.2%, respectively). A further **35.3%**, dominated by visual (13.8%) and motor (10.5%) barriers, falls in the Moderate band, where intuitive design provides only partial or indirect leverage and must be paired with complementary ergonomic, accessibility, and multimodal measures. The remaining **11.8%** — largely trust, auditory, and resource-related barriers — lies structurally beyond the reach of intuitive interaction and requires alternative interventions. Based on the analytical mapping conducted in this study, intuition-oriented design appears to offer its strongest, most direct leverage over roughly half of the barrier burden, with diminishing and increasingly indirect returns across the sensory, trust, and resource barriers that make up the remainder (Figure 7c).

Figure 7

Barrier coverage by the intuition typology: coupling, prevalence, and aggregate



Note. Panel (a) shows the coupling between the twenty interaction barriers and the four intuition types (filled = primary mechanism; open = secondary/partial; blank = not addressed). Panel (b) shows each barrier's prevalence as a percentage of 3,640 coded segments, colored by mitigation-potential band. Panel (c) shows the aggregate coverage of the barrier burden by potential band. Barrier prevalences are reproduced from earlier phase of the doctoral research programme (Authors, in review).

7. Discussion

This study set out to determine how intuition is defined and conceptualized in the context of older adults and which intuition types are most relevant to mitigating their interaction barriers. The systematic review and reflexive thematic analysis yielded five themes and a four-part typology; this section integrates these findings into a theoretical definition, identifies the most relevant types, notes conceptual gaps, draws out implications for design for ageing, and states the limitations of the review.

7.1 A Theoretical Definition of Intuition for Older Adults

Drawing together Themes 1–5, intuition in this context is defined as follows:

> *In the context of older adults' interaction with digital interfaces, intuition is a fast, largely non-conscious mode of cognition that operates through four interrelated components. At its foundation (IT-1), it consists of the automatic activation of accumulated experiential and crystallized knowledge. This foundation is enacted at the interface through two complementary mechanisms: the recognition of familiar perceptual and conceptual cues that match the user's prior conventions, expectations, and mental models (IT-2), and the reading of affordances, real-world metaphors, and embodied action–meaning couplings (IT-3). The activation of these mechanisms is facilitated by interface simplicity and clarity and is moderated by sociocultural and situational framing (IT-4). When these conditions are met, intuition enables comprehension and action with minimal analytic effort; its reliability is contingent on the alignment between interface structures and the user's prior experience, and is constrained by age-related cognitive resources.*

Unlike a generic account, this definition is a direct synthesis of the four-part typology: it specifies the experiential foundation (IT-1), the two interface-level enactment mechanisms (IT-2, IT-3), the enabling role of simplicity, the moderating role of context (IT-4), and the functional outcomes and constraints established in Themes 4 and 5. Each clause therefore corresponds to a component derived from the reviewed evidence base rather than from a pre-existing theoretical position. It is consistent with established accounts of intuition as the non-conscious application of prior knowledge in HCI (Blackler et al., 2010) and with dual-process theory (Kahneman, 2011), while specifying the features that matter for ageing.

7.2 Which Types Are Most Relevant for Older Adults

The analysis suggests that Experiential Intuition (IT-1) and Recognition-Based Intuition (IT-2) were the most consistently represented types across the reviewed literature. Both rest on crystallized knowledge and prior experience, which are comparatively preserved in later life even as fluid abilities decline (Horn & Cattell, 1966; Park & Reuter-Lorenz, 2009); this is why IT-1 was evidenced by all eleven studies and IT-2 by the second-largest body of segments. Embodied Intuition (IT-3) is an important complement, providing concrete, body-based cues that reduce sensory–motor and learning demands, while Contextual Intuition (IT-4) functions as a moderator that becomes more influential with age. For design, the priority is therefore to engage preserved experiential and recognitional intuition, reinforced by embodied cues and tuned to users' cultural frame.

7.3 Conceptual Gaps and Relation to Prior Work

Two conceptual gaps are evident. First, although intuition is consistently defined as experience- and recognition-based, its measurement remains heterogeneous — ranging from reaction-time and task-time indices to self-report and conceptual analysis — and few studies operationalize intuition specifically for older adults. Second, the constraint side (Theme 5) is comparatively under-researched relative to the facilitation side (Themes 1–2), leaving the breakdown conditions of intuitive use in ageing only partially specified. The typology addresses the first gap by distinguishing types with different mechanisms and the second by explicitly pairing each type with the barriers it can and cannot mitigate.

Beyond addressing these gaps, the typology contributes to HCI theory by reframing intuitive interaction in later life as a multi-mechanism construct rather than a unitary phenomenon. Existing research frequently treats intuition as a single capability or outcome of interaction. The present synthesis suggests instead that intuitive use may emerge through distinct yet interrelated pathways — experiential, recognition-based, embodied, and contextual — each relying on different cognitive resources and operating under different conditions. This distinction helps explain why some interfaces remain intuitive for older adults despite age-related declines, while others do not. By specifying these mechanisms and their associated constraints, the typology provides a more differentiated theoretical account of intuitive interaction in ageing than has been available in previous work.

7.4 Implications for Design for Ageing

The barrier mapping translates the typology into design guidance. Because intuition most effectively addresses interaction-level barriers associated with cognition, recognition, interpretation, and action interfaces for older adults should prioritize recognizable, convention-consistent layouts and metaphors (IT-2, IT-3); simple, clear, and where helpful text-based or redundant presentation (Subtheme 2.3); adaptable structures tuned to a user's prior knowledge

(IT-1); and culturally congruent symbols and workflows (IT-4). Sensory, motor, trust, and resource barriers require complementary ergonomic, multimodal, security, and policy measures, since they fall outside the reach of intuitive design.

Importantly, these findings should not be interpreted as suggesting that intuition addresses all barriers experienced by older adults. Rather, the typology identifies those barriers that are plausibly amenable to intuition-driven design intervention. Resource-related, infrastructural, and broader socio-technical barriers require complementary organizational, technological, and policy responses beyond the interface itself. This division of labor provides a principled bridge from the conceptualization of intuition to its operationalization in interface design.

7.5 Limitations

Several limitations should be considered when interpreting these findings. The corpus was limited to English-language publications from 2015–2025 and three databases, and three full texts could not be retrieved; therefore, relevant evidence outside these boundaries may have been missed. The final corpus of eleven studies was appropriate for the exploratory configurative synthesis undertaken, although a broader evidence base may further extend the proposed conceptualization. Data interpretation was conducted by a single analyst; consistent with reflexive thematic analysis, this was treated as an interpretive process, with credibility supported through transparent coding procedures, expert review, and software-assisted data management. Finally, the proposed typology should be interpreted as an analytical synthesis of the reviewed literature rather than as an empirically validated model. Future research should examine the structure, boundaries, and practical utility of the typology through empirical studies involving older adults.

8. Conclusion

This study conceptualized intuition for older adults through a PRISMA-guided systematic review of eleven studies synthesized with reflexive thematic analysis. The analysis produced five themes — the cognitive–experiential foundation of intuition, recognition and familiarity as its interface mechanisms, contextual and cultural shaping, functional and cognitive benefits, and age-related constraints — from which a four-part typology was derived: experiential (IT-1), recognition-based (IT-2), embodied (IT-3), and contextual (IT-4) intuition. A theoretical definition of intuition for older adults was proposed, and IT-1 and IT-2 were identified as the most relevant types, given the relative preservation of crystallized knowledge in ageing. Mapping the typology onto twenty interaction barriers showed that intuition-based design most directly targets the cognitive and design–interaction barriers — approximately 53% of the barrier burden — while offering only partial, indirect leverage over sensory and motor barriers and leaving trust, auditory, and resource barriers to complementary solutions. The typology thus offers both a conceptual clarification of intuition for an ageing population and an actionable basis for prioritizing intuition-oriented design strategies, which future empirical work can test directly.

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