

White Paper

Sound That Feels Like You: The Sound Preference Framework for Personalized Hearing Part 1

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Abstract

It is well known that although hearing aids restore audibility and improve speech understanding, many users still struggle to use them consistently. Long-term success appears to depend at least as much on how the sound feels, and whether it is comfortable and meaningful in everyday life, as on compensation for hearing loss alone.

This paper introduces a three-layered Sound Preference Framework which links the emergence and significance of sound preference with clinical approaches that support client engagement and sustained hearing aid use. Specifically, this paper focuses on the first framework layer – Sound Preference Formation – to clarify why the same sound can feel right to one person and wrong to another. Drawing on multiple areas of psychology and neuroscience, sound preference is shown to be the result of four interacting processes: Sensory comfort, emotional reward, cognitive ease, and social meaning. Together, these shape whether a hearing aid sound is accepted and used over time.

The remaining layers of the framework, the Sound Preference Approach and the Sound Preference Exploration, translate the theoretical insights from

the current paper into clinical practices that support engagement, ownership, and long-term hearing aid use (see Engelund & Fischer, 2026).

By reframing sound preference as an indicator of individualization rather than subjective taste, the framework provides HCPs with a new way to explore individual sound preference and guide hearing aid selection and fitting decisions.

Clinical opportunities

- Hearing aid fittings should reflect neurological tolerance as well as audiological correct fittings, supporting early cognitive ease and adaptation.
- Sound preference can inform clinical decision-making, serving as a practical indicator for individualization of fitting.
- Focus on personally valued sounds in counselling may promote hearing aid adaptation, strengthening engagement and long-term satisfaction.

Introduction

Technologically, modern hearing aids do what they are designed to do: They make sounds audible and speech easier to understand. However, hearing is not only about detecting sound, but at least as much about how that sound is experienced in everyday life. This distinction may be behind the markedly different responses to hearing aids observed by most hearing care professionals (HCPs) and richly documented in research literature.

On the positive side, large-scale surveys show that many hearing aid owners experience substantial benefits from their hearing aids. In the MarkeTrak 2025 sample of American hearing aid owners, about 83% report being satisfied and around 90% report improved quality of life, particularly in communication and confidence (Dobyan & Kihm, 2025). Similar patterns appear in the international EuroTrak data where most hearing aid users report better communication and greater confidence, and about 65% say they wish they had sought help earlier (Powers & Bisgaard, 2022).

However, these positive outcomes coexist with a persistent contradiction. Even well-fitted hearing aids may not always feel useful or worthwhile (Laplante-Lévesque et al., 2012), and many hearing aid owners are not regular users (Dobyan & Kihm, 2025; Jilla & Jorgensen, 2025). The problem appears early: During the initial hearing aid fitting period, about 15% of first-time users return their hearing aids, most often because of limited perceived benefit or difficulty adapting to everyday life (Humes, 2021).

This is not a marginal problem. A 2023 meta-analysis of 21 studies including more than 12,000 hearing aid users found that only 62% actually used their hearing aids, meaning that nearly four in ten did not (Marcos-Alonso et al., 2023). The two dominant reasons for non-use were also here discomfort and lack of perceived benefit, rather than audiological factors.

Taken together, these findings show that the subjective experience of sound is one central aspect of hearing aid success. When experienced users upgrade their hearing aids, sound quality is the factor that increases in importance more than any other feature. In MarkeTrak 2022, 64% of repeat buyers reported that sound quality had become more important, exceeding size, appearance, or wireless connectivity (Carr & Kihm, 2022). Continued use likewise depends on whether sound feels comfortable, manageable, and supportive of everyday life (Humes, 2021; Knoetze et al., 2023).

This evidence on the importance of the subjective experience of sound indicates a critical gap in current hearing care approaches. Sound is generally amplified well, but the listening experience is not always in focus. People disengage not because hearing aids fail technically, but because the sound does not yet feel right for them. Research shows that up to 40% of listeners indicate a strong preference (Balling et al., 2026) for one or the other of two audiological well-fitted high-end hearing aids, with differences in preference not being explicable by audiogram, age, or lifestyle. Instead, people differ in how the sound feels, how effortful it is to listen, and how likely the sound is to fit into their everyday lives. To make sense of these differences in a way that is both scientifically grounded and clinically useful, a more comprehensive view of sound preference is needed.

The Sound Preference Framework introduced in this paper provides such an integrated view. By understanding the processes that shape sound preference, hearing care can move beyond audibility toward sound that people recognize, accept, and ultimately make their own.

Development of the sound preference framework

The current work synthesizes insights from multiple research fields that each capture a different part of how people experience sound:

Auditory neuroscience – how the brain encodes and adapts to sound.

Affective neuroscience – how sounds trigger stress or reward responses.

Cognitive psychology – how cognitive fluency, effort, and expectation shape listening.

Social and cultural psychology – how identity, context, and belonging influence sound perception.

Behavioral decision making – how autonomy, confidence, satisfaction, and co-creation affect behavioral changes and clinical outcomes.

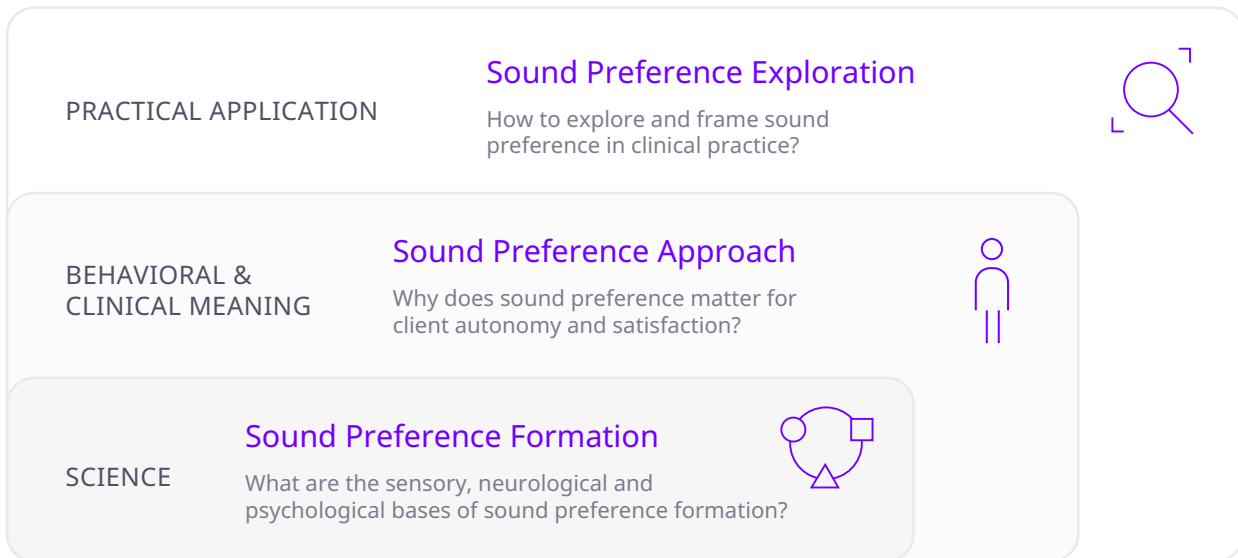


Figure 1: The Sound Preference Framework – a comprehensive model to connect the experience-driven development of sound preferences with a research-based implementation of sound preference as a clinical tool.

Insights from these five fields shape the three-layered **Sound Preference Framework**, which includes Formation, Approach and Exploration (see Figure 1). Together, these layers connect sound preference formation with a research-based clinical approach and tool for co-creating ownership.

- **Sound Preference Formation.** Sound preference is not about a simple liking but evolves with experience and reflects layered sensory, emotional, cognitive, and social processes. For hearing aid provision, sound preference serves as an indicator of the fit between the whole person and the sound experience.
- **The Sound Preference Approach** frames sound preference as a clinically actionable factor for supporting autonomy and fostering emotional engagement in the whole provision process. When integrated into clinical practice, the Sound Preference Approach can shift the hearing aid fitting from a purely technical adjustment to a user-centered experience that enhances hearing aid satisfaction and long-term adoption.
- **The Sound Preference Exploration** builds on this and proposes a clinical tool that can support users in comparing hearing aid sound profiles and choosing the one that best fits their identity, emotions, and goals. This reframes sound choice as a process of co-creation rather than passive compliance.

The **Sound Preference Framework** complements current clinical strategies, especially for situations when audiotically correct fittings do not feel right to the client. It offers HCPs a way to align hearing aid sound not just with the audiogram, but with the whole person. In doing so, it supports a broader shift in hearing care: from technical optimization toward user engagement, ownership, and empowerment. Ultimately, the Sound Preference Framework is not just about improving hearing, it is about restoring connection: to sound, to others, and to self.

With this foundation in place, we can now look more closely at the first layer of the framework.

Sound preference formation: the brain behind preference

When people say, “This one just feels right,” it is the outcome of deeply layered neurological and psychological processes. Sound preference begins long before any concrete moment of comparison, shaped by the brain, the body, and the person’s experiences. It emerges from four interwoven processes (illustrated in Figure 2):

Sensory Comfort – the perceptual ease of listening.

Emotional Reward – the affective resonance of a sound.

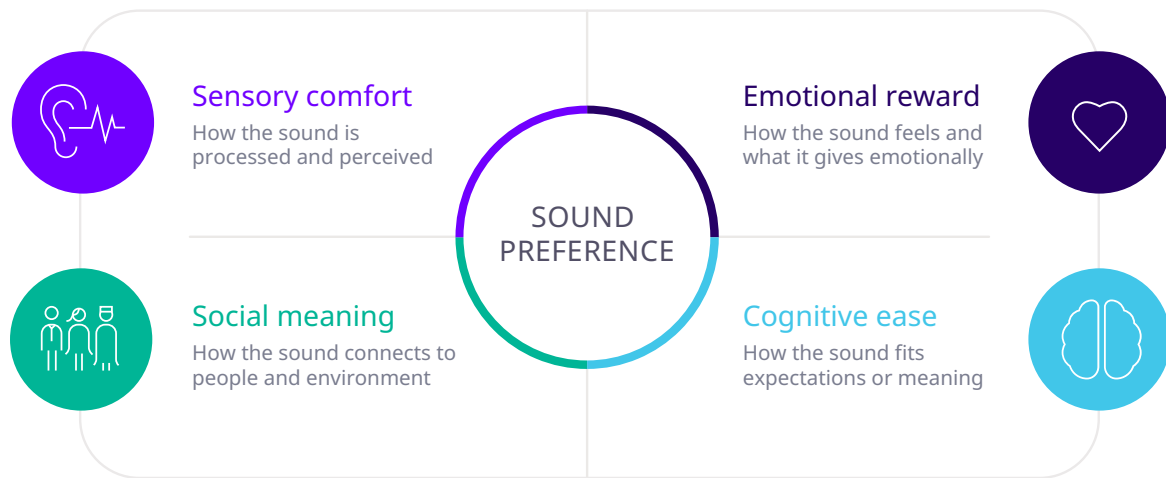


Figure 2: The Sound Preference Formation Model explains Sound Preference as a result of four interwoven processes that shape the perception, evaluation, and memory of sounds.

Cognitive Ease – the predictability and fluency with which sound is processed.

Social Meaning – the cultural and identity-based relevance of sound.

These processes demonstrate that sound preference is not a simple like or dislike, but an indicator of the fit between the listener and their world. For hearing aid provision, this implies that, when hearing aids sound “right,” it is not just because their output matches a curve on a screen, but because their sound resonates with the person’s life and experiences. To appreciate how these four processes together result in the experience of “this feels right,” we now examine each in detail.

Sensory Comfort: Listening Without Strain

Sensory comfort in listening is rooted in physiological response, with the central auditory system continuously and unconsciously monitoring the acoustic environment. When features such as frequency spectrum, temporal modulations, and loudness (McDermott, 2012) are optimized, listening feels natural and effortless. Conversely, when they are compromised, discomfort arises. Aversive sounds engage not only the auditory cortex but also the amygdala, a key component of the stress-response system (Kumar et al., 2012). Such physiological responses vary across individuals: noise sensitivity research shows reliable individual differences in reported sensitivity, perceived loudness, and annoyance responses to sound under controlled exposure conditions (Abbasi et al., 2021).

Personality plays a significant role in explaining why listeners differ in their perceptual sensitivity to identical sounds, with the ‘Big Five’ traits (extraversion, neuroticism, openness, agreeableness, and conscientiousness) accounting for a substantial proportion of variance. Notably, extraversion is the strongest predictor, such that more introverted individuals tend to report greater sound sensitivity and annoyance (Shepherd et al., 2015).

When hearing aid sounds are perceived as too sharp, loud, or spatially confusing, the effect goes beyond superficial annoyance. It activates stress-related neural circuits, making listening effortful and potentially leading to disengagement or hearing aid rejection. Importantly, stable personality differences shape how acoustic features are experienced and evaluated. This suggests that achieving a positive hearing aid outcome requires careful acoustic tuning that also considers the listener’s personality.

Although initial hearing experiences in this way are shaped by personal factors, early judgements are not static. Sensory comfort evolves over time through the brain’s adaptive mechanisms, with the auditory system capable of recalibrating what feels “normal” (Dawes & Munro, 2017; Dawes et al., 2014) through repeated exposure and reassurance. This plasticity enables successful hearing aid adaptation, but unmanaged early discomfort can derail the process. HCPs must therefore address both phases: minimizing initial strain and supporting the gradual redefinition of comfort.

Emotional Reward: When Sound Feels Good

Why do some sounds make us smile before we even know why? Preferred sounds elicit activity in reward-related brain regions, particularly the nucleus accumbens (Gold et al., 2019), linking specific sounds to feelings of safety, joy, or connection. Neuroimaging studies further show that highly pleasurable musical experiences activate an extensive reward network, including the ventral striatum, midbrain, orbitofrontal cortex, and limbic structures. Activity within these regions increases in proportion to subjective pleasure intensity and is accompanied by physiological responses such as chills (Blood & Zatorre, 2001). Together, these findings indicate that emotional reward from sound is both automatic and deeply embodied.

This layer of preference becomes especially salient when hearing aids restore access to emotionally meaningful sounds such as a child's voice, birdsong, or familiar music. Listening to these sounds is not merely pleasant, they serve as affective anchors that reinforce the decision to use hearing aids.

Context also matters. People tend to perceive natural sounds as more pleasant and human sounds as more eventful compared to technical sounds, regardless of loudness (Axelsson et al., 2010), while Schäfer (2016) showed that strong sound preferences are associated with past experiences that consistently supported social relatedness or mood regulation. This highlights the role of social meaning in shaping emotional appraisal of sounds.

Extending this reasoning, if hearing aid sound consistently promotes calmness or social inclusion, the brain may begin to associate that sound with emotional reward, ultimately strengthening hearing aid preference. For HCPs, this highlights the importance of considering not only audibility but also early exposure to personally valued sounds during counselling. This may help to establish positive associations and ultimately foster hearing aid satisfaction.

Cognitive Ease: The Fluency of Perception

Imagine entering a familiar room in complete darkness and immediately locating the light switch. This illustrates fluency, the effortless processing the brain also strives for when perceiving sound. Cognitive ease is the subjective experience of fluent processing due to matched expectations.

Fluency and cognitive ease have been widely explored across domains, including speech perception (Friston, 2010; Rönnberg et al., 2013). Cognitive ease is accompanied by positive affect and an increased liking of the fluent percept (Reber et al., 2004); in other words, preference for the sound that is experienced as fluent.

Neuroscientific evidence supports these perspectives. For example, Sohoglu and Davis (2016) used neuroimaging to show that the availability of matching prior knowledge reduces auditory cortical responses during perception of degraded speech. This reduction in neural activity, particularly in the superior temporal gyrus, suggests more efficient predictive processing and increased perceptual ease. Extending this, physiological studies demonstrate that reduced predictability or increased signal complexity led to increased listening effort and decreased cognitive ease (e.g. Miles et al. 2017). Taken together, these findings illustrate a common principle: The brain works less when it can predict what it is about to hear.

Importantly, fluent perception is not solely about what is understood, but also about how effortlessly it is understood. As shown by Winn and Teece (2021), listeners can experience substantial mental fatigue even when intelligibility scores appear optimal, indicating that correctly repeating words in

a speech test does not necessarily imply cognitive ease. The Framework for Understanding Effortful Listening (Pichora-Fuller et al., 2016) conceptualizes this effort as the cognitive resources required to overcome auditory challenges.

These insights have important implications for hearing aid sound design and user experience. When the sound delivered by hearing aids aligns with an individual user's preference, it facilitates cognitive ease through fluent auditory processing, which in turn can enhance appreciation of sound and satisfaction with hearing aids. Conversely, when hearing aid sound is unpredictable, cognitive load increases, which may lead to fatigue, frustration and maybe even rejection. This may help explain why some audiological accurate fittings can "feel wrong" when they fail to match the listener's individual perceptual expectations.

To address this, HCPs should support both immediate fluency and ongoing implicit processing, i.e. automatic listening without conscious effort. Preference for a sound can serve as an indicator of subjective cognitive ease, and implicit processing ensured by repeated exposure and practice may promote long-term acceptance of hearing aids.

Social Meaning: Sound as a Marker of Identity

Sound is more than an acoustic signal – it is a social cue and marker of identity, in music psychology (MacDonald, 2021) and beyond. Experimental work by Shankar et al. (2013) demonstrates that when noise carries social meaning aligned with a person's identity, listeners find loud sounds more interesting and less uncomfortable, they feel better and listen longer. Soundscape research further indicates that personality traits contribute to variability in how individuals evaluate everyday acoustic environments (Lindborg & Friberg, 2015).

Social meaning can also emerge from how sound itself is experienced in relation to the listener. Recent research on 'pseudo-social music listening' describes how listening to recordings may be experienced as emotionally or socially present despite the absence of direct social interaction. Some listeners describe feelings of companionship, empathy, or emotional presence when listening to recordings, while others do not (Bannister et al., 2025). These findings extend social meaning beyond external context, suggesting that sound may function as a perceived social partner, shaping emotional response and engagement through its relational significance.

Beyond perceptual evaluation, listening can trigger the release of oxytocin, a neurochemical associated with trust and social bonding (Greenberg et al., 2021), reinforcing that sound operates as a biological signal of identity and connectedness. In hearing care, this helps explain why two acoustically similar processing profiles can evoke different emotional responses: they carry different social and personal meanings.

Recognizing this helps HCPs align fittings with their client's self-image, not just their audiological needs. Early conversations about lifestyle, identity, and valued listening situations can help ensure that hearing aid sound is not only audiotically correct but personally meaningful.

Adaptive Feedback Loop: How Preference Evolves over Time

In conclusion, auditory preference reflects a multidimensional construct shaped by sensory processing, emotional memory and reward, perceptual fluency, and social meaning. Rather than a simple matter of liking, it represents an integrated outcome of physiological, cognitive, and emotional mechanisms.

Over time, preference evolves through an adaptive feedback loop driven by repeated listening experiences in which prediction errors are minimized, updating internal expectations with each exposure (Friston, 2010). When these predictive updates consistently yield positive outcomes, reward-learning consolidates the preference for fluent sounds (Hansen et al., 2017).

Sound preference can therefore serve as a dynamic indicator reflecting the listener's ongoing adaptation to their sound ecosystem, including the hearing aid. Clinically, this makes preference a meaningful indicator of both adaptation progress and psychosocial alignment, offering HCPs insight into where users are in their journey and what type of support – technical, emotional, or behavioral – may be most beneficial next.

Sound preference as a clinical resource

Sound Preference Formation provides HCPs not only with a theoretical explanation of diverse listening experiences but also with a framework for understanding the individual sound experiences that may drive long-term hearing aid use or rejection. As this paper has shown, people do not disengage because hearing aids fail technically, but because sound feels effortful, uncomfortable, or disconnected from everyday life. Focusing on sound preference allows those experiences to be identified and addressed within clinical practice.

By framing sound preference as an emergent outcome of sensory comfort, emotional reward, cognitive ease, and social meaning, HCPs gain a lens for understanding and interpreting their clients' sound experiences. Within this perspective, sound preference is not a superficial like or dislike, it is a signal of whether the sound fits the listener and their context.

This perspective also shows that when clients react to sound, those reactions are not noise in the fitting process; they are data, revealing strain or ease, emotional resonance or mismatch. Treating sound preference as informative allows HCPs to guide adjustments, and counselling in ways that support hearing aid adaptation. In this way, sound is no longer something users passively receive, but something they actively recognize, shape, and begin to trust and take ownership of.

While sound preference offers a promising clinical lens, it should not be understood as a finite or fixed fitting outcome. Sound preferences may fluctuate across contexts and over time as new listening experiences accumulate. To avoid anchoring fittings in short-term comfort alone, sound preference should therefore be treated as a dynamic and exploratory indicator to inform audiological principles and gradual adaptation strategies. When framed this way, sound preference can take on a relational role within clinical interaction. It opens for conversations that go beyond "What can you hear?" and "How does it sound?" toward "How does this sound feel?" and "How does it support what you want and need?" Such questions invite clients into the fitting process as active participants, supporting autonomy, confidence, and sustained engagement.

The translation of these insights into structured sound exploration, guided choice, and clinical practice is the focus of Engelund & Fischer (2026)'s introduction of the Sound Preference Approach and Exploration layers of the Sound Preference Framework.

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