Designing Wooden Lounge Chairs Using ZMET: From Deep Need Discovery to Value Hierarchy Construction

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Traditional furniture design methods often fall short in revealing users' deeper psychological and emotional needs. This study innovatively introduced the Zaltman Metaphor Elicitation Technique (ZMET) as an exploratory tool in the field of furniture design to bridge the cognitive gap between latent user needs and practical design. Through image collection, laddering interviews, and Kelly Repertory Grid Technique (RGT), cognitive modeling was conducted with six high-involvement users. A total of 119 concepts were identified, covering ten design attributes (*e.g.*, "ergonomic fit," "warm color tones"), seven emotional needs (*e.g.*, "stress relief," "immersive experience"), and five value hierarchies (*e.g.*, "sense of belonging," "self-actualization"). The resulting Hierarchical Value Map (HVM) illustrated a three-level structure of "attribute – consequence – value," clearly mapping the psychological pathway from product features to core user values. The findings revealed that users expect more than basic functionality from wooden lounge chairs, seeking emotional resonance, lifestyle alignment, and identity expression. ZMET was shown to be effective in uncovering non-verbalized user needs and offers a theoretical and methodological framework for value-driven, user-centered furniture design.

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INTRODUCTION

Understanding users' true needs and emotional values is critical for innovation in contemporary furniture design (Norman 2007). In recent years, user-centered design has gained prominence, encouraging designers to move beyond superficial functionality toward deeper insights into users' psychological and subconscious motivations (Li and Hölttä-Otto *et al.* 2018). According to the Kano model, user satisfaction is positively associated with the degree to which their needs are fulfilled (Kano 1984). Product design, particularly in furniture, plays a key role in influencing purchasing decisions, making user-driven innovation vital for market success (Zhao and Xu 2023). Despite this, users often struggle to articulate their innermost desires, creating a disconnect between product offerings and actual expectations (Chamorro-Koc *et al*. 2008). This issue is particularly pronounced in wooden furniture design, where the material's inherent warmth and emotional associations are difficult to express through traditional verbal tools such as surveys or interviews. Wooden lounge chairs, which are commonly associated with

relaxation and comfort (Zhao and Xu 2023), require design methods that delve into both physical ergonomics and psychological resonance.

While prior research has employed physiological indicators such as pressure distribution, eye tracking, EMG, and EEG to evaluate seating comfort objectively (Zhu and Lv 2023; Lim *et al*. 2020; Kim *et al*. 2016), these approaches often neglect users' emotional engagement (Lei *et al* 2024). Wooden furniture, as a hybrid of functionality and emotional symbolism, necessitates methodologies capable of exploring subconscious perceptions and value-based design intentions (Kaputa *et al*. 2018).

Traditional interview methods are limited by linguistic constraints and often fail to access users' implicit emotional cognition expressed through imagery or metaphor (Mulvey and Kavalam 2010). ZMET, with its image-metaphor and laddering mechanism, offers a promising alternative for uncovering unspoken user needs. This study is the first to apply ZMET systematically within furniture design, aiming to construct a pathway from user perception to core value realization. In doing so, the study enriches user research theory and supports enterprises in reducing material waste, shortening development cycles, and advancing sustainable and intelligent manufacturing.

LITERATURE REVIEW

Conventional qualitative methods, such as interviews alone, often lack the depth necessary to reveal the subconscious value perceptions embedded in users' minds (Mulvey and Kavalam 2010). In response to this limitation, Zaltman and Coulter (1995) developed the Zaltman Metaphor Elicitation Technique (ZMET) method, which enables researchers to explore user thinking through images, stories, and metaphors. ZMET's advantages include its capacity to elicit multisensory experiences and implicit thoughts that are difficult to verbalize (Ji and King 2018). As a structured research method, ZMET helps designers understand users' internal motivations, attitudes, and product-related values, especially in early design stages. It also identifies pain points and new opportunities for innovation. Research by Ganassali and Matysiewicz (2018) indicates that image-based elicitation yields richer emotional granularity and captures the contextual meaning of user experiences more effectively. ZMET is grounded in the premise that 85% of human thinking is image-based, with most perceptions occurring at the subconscious level (Zaltman 1996, 1997). In ZMET interviews, participants select images to represent their perceptions and feelings about a product, and these images serve as surface metaphors for deeper cognitive and emotional structures (Coulter *et al*. 2001).

ZMET has been widely adopted in commercial contexts (*e.g*., Audi, Coca-Cola, Mercedes-Benz) and in academic fields such as brand association (Hogan *et al*. 2016; Jain *et al.* 2018), value construction (Seo and Buchanan-Oliver 2019), consumer decision-making (Christensen and Olson 2002; Micu and Plummer 2010), and graphic design (Hancock and Foster 2020). Olson *et al.* (2009) also highlighted ZMET's application in service design, demonstrating how it supported architects in creating emotionally resonant environments in pediatric care. Despite its diverse applications, ZMET remains underutilized in furniture design—particularly for wooden furniture, where emotional perception is key. This study aims to address this gap by systematically applying ZMET to uncover users' deep-seated emotional and value-based expectations for wooden lounge chairs.

RESEARCH DESIGN AND METHODOLOGY

Participants

A preliminary screening was conducted using the Bauer *et al* (2006) product involvement scale. From over 20 participants, six high-involvement users were selected (scores⩾30; average age 26.5; 3 males and 3 females), all of whom used lounge chairs for 7 to 9 hours daily across diverse scenarios such as home offices, study, and leisure. The sample met the "data saturation" principle (Coulter and Zaltman 1994).

Research Phases

The first and most crucial step in product design is to uncover and define user needs. Only when a product's inherent attributes align with user expectations can it occupy a meaningful place in the market. The Means-End Chain (MEC) theory serves as the theoretical foundation of ZMET (Baker *et al*. 2004). As shown in Fig. 1, MEC provides a hierarchical value model that links product attributes (design features), consequences (psychological needs), and end values (deep-seated user values), forming a conceptual chain from concrete to abstract dimensions (Ha and Jang 2013).

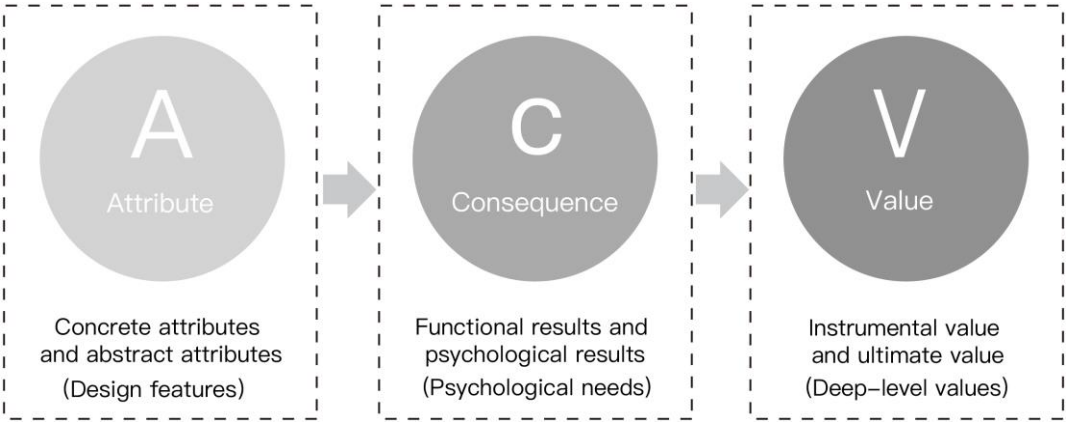


Fig. 1. Schematic diagram of the MEC structure

ZMET operationalizes this framework by guiding participants from discussing tangible features toward revealing the personal meanings and value structures they associate with a product or service. In this study, ZMET was applied to wooden lounge chair design, with the complete research flow illustrated in Fig. 2.

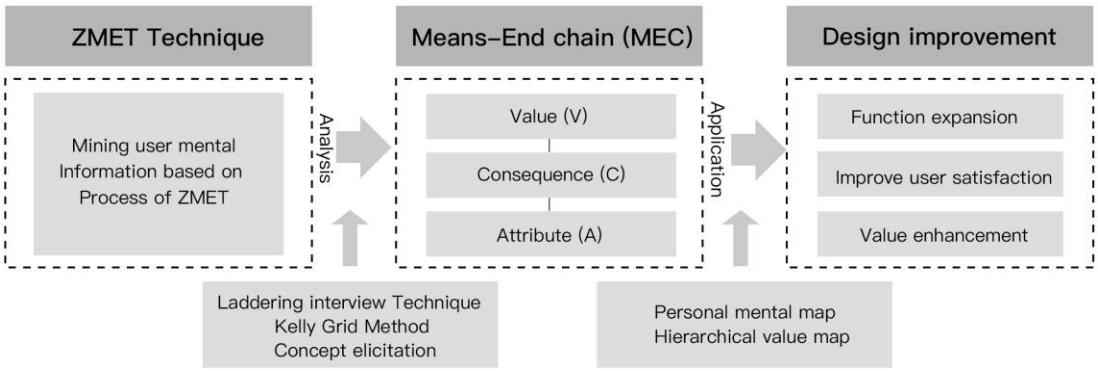


Fig. 2. Design process of wooden lounge chairs based on the ZMET method

ZMET's original framework consists of ten procedural steps. However, researchers may adapt or omit certain steps depending on the research context (Khoo-Lattimore and Prideaux 2013). For this study, the ZMET process was divided into three main phases: (1) Pre-interview preparation; (2) Mental model elicitation (interviews); and (3) Information analysis and HVM construction (Fig. 3).

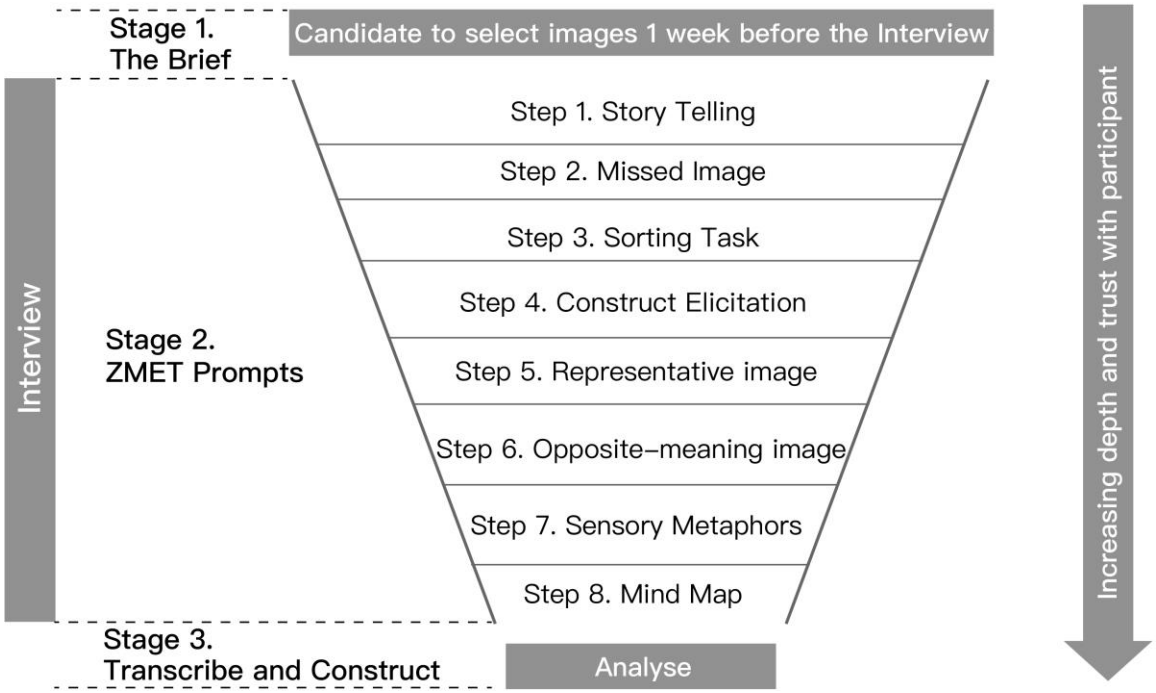


Fig. 3. Three stages and interview steps of ZMET

Pre-interview preparation

Approximately one week prior to the interviews, researchers conducted a 15 to 20 minute briefing session with each participant to introduce the research objectives and procedures. Participants were then instructed to collect approximately ten images related to the theme of their "ideal wooden lounge chair". These images, gathered from diverse sources such as websites, posters, comics, or personal photographs, were expected to reflect their thoughts and feelings when using such a chair. Importantly, participants were explicitly asked to avoid selecting images that directly depicted any type of chair or seating furniture.

Mental model elicitation (interviews)

In-depth interviews were conducted as the primary method for accessing users' implicit knowledge and mental representations. This qualitative approach enabled researchers to gather rich, internalized insights that would otherwise be difficult to obtain through surface-level questioning. Throughout the interviews, both verbal responses and participants' accompanying gestures or behavioral cues were carefully observed and recorded. To illustrate the ZMET process in detail, this paper presents the complete interview and analysis workflow for Participant 01, a 26-year-old individual who scored 36 points on the product involvement scale. The following section outlines the step-by-step procedure used to collect and interpret this participant's cognitive imagery and conceptual associations.

Step 1. Eliciting mental images (story telling)

At this stage, participants were invited to reflect on their thoughts and feelings regarding their "ideal wooden lounge chair." Using the laddering interview technique, the researchers conducted one-on-one in-depth interviews to extract key concepts based on Means-End Chain (MEC) theory. The MEC method, implemented through face-to-face interviews combined with laddering as a probing strategy, serves as a critical tool to explore user preferences concerning product attributes and services.

This approach facilitates the identification of the core elements and linkages among Attributes (A), Consequences (C), and Values (V), guiding participants step by step up the abstraction ladder—from concrete features to psychological needs and ultimately to underlying personal values. During the laddering process, probing questions were used in tandem with the "soft laddering" technique to uncover the three-level associations of "attributes–consequences–values" and to construct their interrelationships. Each A–C–V linkage is referred to as a "ladder." A summary of participant responses collected in this phase is presented in Appendix S1.

Step 2. Description of unavailable image

Participants were asked to describe an ideal image of a wooden lounge chair that they searched for but could not find. This step aimed to reveal unmet expectations. Key concepts extracted are summarized in Table 1.

Table 1. Summary of Participant Interviews (Step 2)

Description of the Unfound Image	Interview Notes
A mother is knitting a very cute hat for her child with fluffy yarn.	Q: What elements in this unfound picture relate to the research theme? A: The materials used for children's items are soft and skin friendly. Q: Is softness and being skin-friendly important to you? Why? A: It reminds me of a mother's hands and hugs, giving a warm feeling. Q: Is the feeling of warmth important? Why? A: Home is a person's lifelong haven. It can soothe the soul and make people calm down.
Concept Extraction	Soft material; Skin-friendly; Warm feeling; Soothing the body and mind

Step 3. Image categorization task

Participants were asked to categorize the selected images and explain their classification criteria and labeling rationale. The summaries of their responses are presented in Table 2.

Step 4: Identifying similarities and differences in image classification

The RGT, widely used in psychology, originates from personal construct theory developed by American psychologist George Kelly (Siraj-Blatchford 1995). Following the RGT framework, participants were asked to select one image from a set of three that differed from the other two and to explain their reasoning. This selection process was repeated iteratively. It is important to note that interviewers avoided leading participants toward any particular concept. The procedure and results are summarized in Table 3.

Table 2. Summary of Participant Interviews (Step 3)

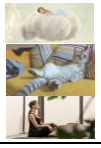
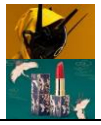
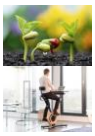
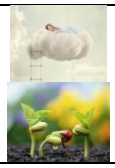
Number	Image	Description	Labels
A		Lying, sitting, or reclining are all comfortable and relaxing. After a tiring day, we really need to relieve tension, ease fatigue, and enjoy life. It has a warm, home-like feeling.	Warm and Comfortable
B		One is small and delicate, the other can be folded. They save space, are easy to move, and are not labor-intensive. The shape is beautiful.	Delicate and Portable
C		I can accept both modern and traditional styles, as long as the color combination is harmonious and aesthetically pleasing.	Harmonious Color Tones
D		The chair offers a stretching experience and additional functions. In a healthy lifestyle environment, it can protect my waist.	Comfortable and Healthy

Table 3. Summary of Participant Interviews (Step 4)

Similar	Different	Description
		The first two primarily focus on psychological feelings, with the chair providing relaxation and pleasure. The right image focuses more on the harmony and brightness of color, which attracts attention and satisfies personal taste.
Concept Extraction		Comfortable; Harmonious colors; Relaxed and pleasant; Self-worth

Step 5. Most representative image

Participants were asked to select the image that best represented the research theme and to explain their choice.

Step 6. Opposite-meaning image

Participants were also asked to identify an image that conveyed a meaning opposite to the research theme. The selected images and participants' explanations are summarized in Table 4.

Table 4. Summary of Selected Images and Explanations (Steps 5-6)

	Image	Reason for Selection
The Most Representative Image		I can enjoy life alone, without having to rush around for promotion and pay raise. Keep a peaceful mind.
The Image with the Opposite Meaning		Its color tone is ordinary, and its styling features are too traditional and lack artistic sense.

Step 7. Sensory associations

Participants were asked to describe their ideal lounge chair using sensory perceptions, including taste, touch, smell, hearing, vision, and overall feeling. The results are summarized in Table 5.

Table 5. Summary of Sensory Associations (Steps 7)

	Resembles	Does Not Resemble
Taste	Soda water	Fried chicken and barbecue flavors
Smell	Urban forest in spring	The smell of cheap strong perfume
Sound	Faint wooden fish sounds in a temple	The sharp sound of fingernails scratching
Touch	As soft and skin - friendly as pajamas	Grease on the table
Sight	Light warm yellow	Black or other dull colors
Emotional	As calm and relaxed as meditation	Restless and annoying

Step 8. Construction of the user mind map

Following the interviews, researchers promptly constructed mind maps for each participant. This process involved reviewing interview recordings, systematically extracting and organizing the various concepts mentioned by the participants, and subsequently inviting the participants to review and revise the drafted cognitive maps. An example mind map for Participant 01 is shown in Fig. 4.

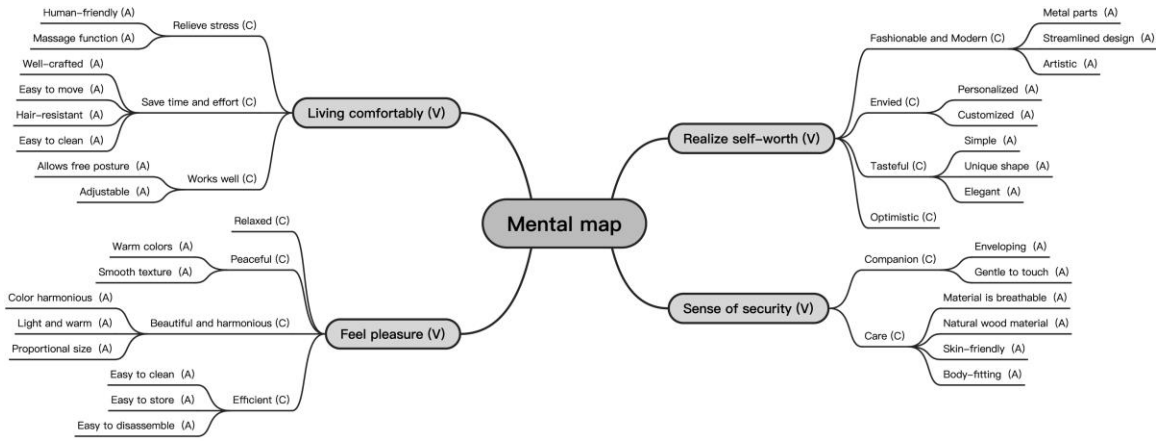


Fig. 4. Mind map of participant 01

Information analysis and HVM construction

Users often interpret the same image differently; however, the ZMET method enables the exploration of their deep-seated thoughts and feelings. When users select certain product attributes that satisfy their needs, they are effectively affirming the underlying values associated with those attributes. By ranking these values according to their importance, users identify the values most relevant to themselves.

In this study, product concepts extracted from the cognitive data of six participants were summarized, categorized, and coded based on Attributes (design features), Consequences (users' psychological or emotional needs), and Values (users' value systems). A total of 119 concepts were generated (Table 6).

The Hierarchical Value Map (HVM), also known as the consensus map, includes only concepts mentioned by at least one-third of the participants, and the relationships between concepts must be referenced by at least one-quarter of them (Zaltman and Coulter

1995). After consultation with the participants, concepts from the initial 119 coded items (attributes–consequences–values) that did not meet these criteria were removed, resulting in the finalized HVM for wooden lounge chairs (Fig. 5). Only the most significant concepts are displayed in the HVM, following further participant validation and the exclusion of less relevant items.

Table 6. Classification of 119 Concepts

Design Features (Attributes)		Psychological Needs (Consequences)		User Values (Values)	
Specific	Abstract	Functional	Psychological	Instrumental	Ultimate
Easy to clean	Soft to the touch	Stretching support	Energetic	Sense of independence	Optimistic attitude
Lint-resistant	Rhythmic form	Agile	Cost-effective	Leadership aspiration	Being respected
Freedom of posture	Sense of enclosure	Easy to use	Stress relief	Sense of responsibility	Sense of belief
Adjustable	Ergonomically designed	Joint relaxation	Appreciation of novelty	Sense of pleasure	Sense of freedom
Light-toned	Quiet environment	Portability	Sense of relaxation	Feeling accompanied	Sense of self-esteem
Metal components	Warm-toned	Burden reduction	Delightful surprise	Sense of cleanliness and order	Happiness and satisfaction
Storage-integrated	Personalized operation	Muscle relaxation	Immersive experience	Creativity	Sense of achievement
Space-efficient size	Fluffy	Effort-saving	Inner peace	Sincerity	Sense of belonging
Integrated massage function	Minimalist design	Mental clarity	Sense of trust	Stimulated imagination	Sense of security
Warm-toned	Distinctive form	Sleep-aiding	Emotional calmness	Affordable sense of luxury	Social recognition
Wooden material	Modern lifestyle	Physical well-being	Usefulness	Pursuit of pleasure	Self-fulfillment
Stainless steel	Streamlined	Visually pleasing	Practical value	Eco-values	
Airbag	Smooth	strength	Being respected	Personal space	
Easy to disassemble	Artistic	Upright posture	Aesthetic appreciation		
Sandalwood scent	Customizable	Enhanced efficiency	Feeling cared for		
Smart features	Body-conforming		Sense of humor		
Leather	Entertainment function		Sense of sharing		
Frosted	Breathable		Open-minded		
Innovative material	Sturdy		Sense of order		
Elastic cushioning	Modern		Fashionable		
	Design-sense		Unrestrained		
	Plain and elegant		Sense of reliability		
	Distinguishable				
	Lightweight design				
	Skin-friendly				
	Durable structure				

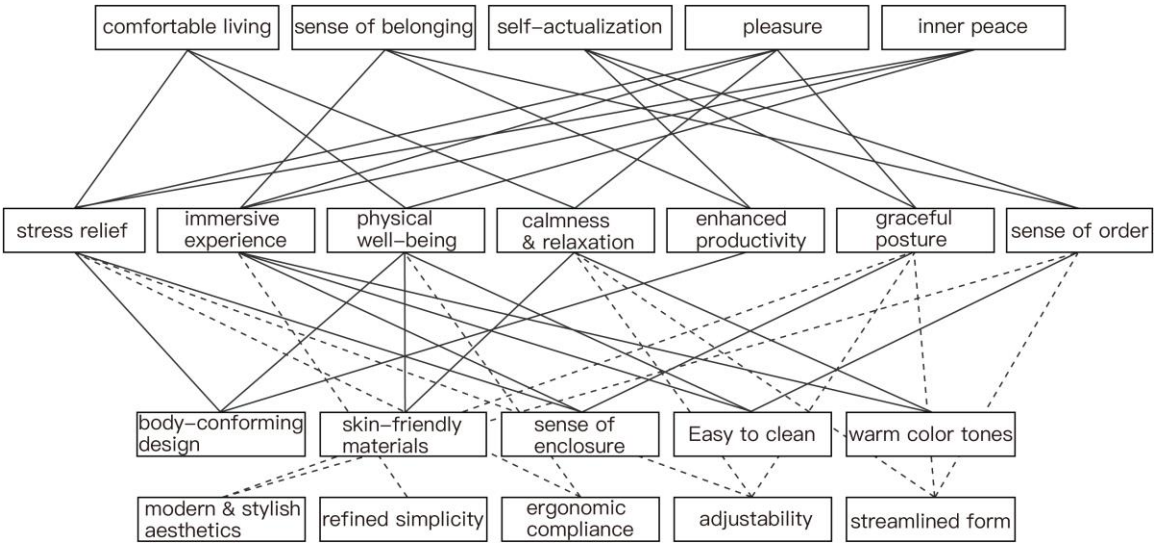


Fig. 5. HVM for wooden lounge chairs

Analysis of ZMET Results

Within the overall application of the ZMET methodology, constructing the HVM represents the core analytical phase. The HVM is not only the final outcome of ZMET analysis, but it also serves as a cognitive tool for visualizing users' mental models and guiding product design optimization. While ZMET provides the research framework and methodological path, the HVM delivers a quantifiable and applicable representation of the results. The HVM clearly illustrates the core concepts associated with wooden lounge chairs and reveals a typical "Attribute–Consequence–Value" (A–C–V) chain. This structure reflects how users progress from specific product features, to positive psychological perceptions, and ultimately to deeply held personal values.

At the attribute level, the HVM identifies ten key product features: body-conforming design, skin-friendly materials, a sense of enclosure, easy to clean, warm color tones, modern and stylish aesthetics, refined simplicity, ergonomic compliance, adjustability, and streamlined form. These attributes, ranked by frequency of mention, can serve as essential references in future design optimization. By comparing existing wooden lounge chairs against these features, designers can identify unmet user needs.

At the consequence level (reflecting users' psychological or emotional responses), seven concepts were identified: stress relief, immersive experience, physical well-being, calmness and relaxation, enhanced productivity, graceful posture, and a sense of order. These express the emotional and experiential dimensions of chair use and reflect users' perception of the lounge chair as a form of personal space.

At the value level, five core values were revealed: comfortable living, sense of belonging, self-actualization, pleasure, and inner peace. These values represent users' ultimate expectations and aspirations regarding the product.

These user needs and value-oriented expectations provide critical guidance for future product optimization. Many of these expectations are not yet fully addressed by existing market offerings. Researchers are encouraged to revisit interview recordings, analyze participant-provided materials, and review both cognitive and hierarchical value maps. This reflective process can yield valuable insights and divergent thinking that are crucial for driving innovative, user-centered design.

DESIGNING WOODEN LOUNGE CHAIRS BASED ON THE HVM

The HVM serves not only as the final output of ZMET analysis but also as a cognitive framework for revealing users' mental models and guiding product optimization. By analyzing the HVM, the "Attribute–Consequence–Value" (A–C–V) chain was identified, which corresponds to the three-tier relationship of design features–psychological needs–user values. Grounded in the insights provided by the HVM, this study takes an existing lounge chair developed by a company as the starting point for a design iteration.

Design Concept

Based on the HVM's three-tier structure—Attributes (design features), Consequences (psychological or emotional needs), and Values (user value systems)—the design of the lounge chair aims to fulfill users' aspirations for comfortable living, a sense of belonging, self-actualization, pleasure, and inner peace. Accordingly, the core value proposition of the design is defined by three guiding principles: comfort, health, and relaxation.

In terms of form and materials, the design must embody key product attributes identified in the HVM, including body-conforming ergonomics, ease of cleaning, skin-friendly materials, a sense of enclosure, modern and stylish aesthetics, warm color tones, refined simplicity, ergonomic compliance, adjustability, and streamlined form.

To align with these insights, a design optimization was conducted based on the existing product DNA of a company's current lounge chair. As shown in Fig. 6, the proposed design concept is named "Chair U". The name "U" refers to the chair's top-view contour, which resembles the letter "U" (Fig. 7). This U-shaped form addresses users' expectations for a sense of enclosure, fluid contours, and refined simplicity—features not fully achieved in the original version. By integrating these design features, the optimized lounge chair enhances users' experiences of pleasure, comfort, and well-being.

Fig. 6. Sketch (left) and design rendering (right)

Design Description

Form and emotional expression

As shown in Fig. 7, the armrest structure adopts concentric curves and asymmetrical contouring, resulting in an overall U-shaped form. This not only meets users' expectations in terms of product attributes but also provides a calming and relaxing visual experience, which helps reduce anxiety and stress. From a side view, the armrest outlines

appear more streamlined compared to the straight lines of the original product, thereby fulfilling the HVM-defined attribute of body-conforming design.

To address issues raised during retrospective interviews—specifically, that smooth armrest surfaces led to slippage when users rested their arms—the redesigned armrests have been slightly widened and extended upward. This improves ergonomic performance and enhances stability. Additionally, the backrest angle is made adjustable, allowing users to modify the reclining position according to personal comfort. This adjustment aligns with the key design features of body-conformity and adjustability, supporting users' core values of pleasure and comfortable living.

Materials, color, and sensory expression

Material selection was guided by key user expectations identified in the HVM, including skin-friendly texture, ease of cleaning, warm color tones, and modern aesthetics, all of which correspond to users' value pursuits of comfortable living and inner peace. The "Chair U" design adopts walnut wood for its main structural frame—a material that conveys a sense of natural warmth, density, and quality.

For the contact surfaces, high-quality breathable PU leather was selected for its waterproof, stain-resistant, and lint-repellent properties. The interior cushioning is filled with high-resilience foam, providing an enhanced sense of enclosure. Combined with the overall concentric form language, the lounge chair fully addresses the key attributes outlined in the HVM. The structural fasteners are primarily made of stainless steel, which both meets the product's performance requirements and ensures mechanical stability. The interplay between the metallic sheen and PU surfaces further emphasizes the design features of modernity and refined simplicity.

As shown in Fig. 7, the primary color palette of the lounge chair was derived from the most frequently mentioned color terms and image selections provided by ZMET participants. The combination of walnut brown and cream white, both within the warm color spectrum, enhances the chair's natural and inviting aesthetic. Visually, it conveys warmth and emotional comfort, while also aligning with the refined aesthetics of modern living.

Fig. 7. Design rendering: Armrest detail (left) and top view rendering (right)

CONCLUSIONS

1. This study represents the first systematic application of the Zaltman Metaphor Elicitation Technique (ZMET) in the field of furniture design, establishing a comprehensive pathway from image metaphors to user cognition to product transformation. Through in-depth interviews with six high-involvement users, a three-level linkage structure—comprising design attributes, psychological needs, and core values—was extracted. This provides both a theoretical foundation and practical reference for user-centered optimization of wooden furniture.
2. ZMET was able to effectively overcome the limitations of traditional verbal expression by evoking authentic, subconscious user perceptions, offering a novel paradigm for non-verbal user research. By guiding users from image representation to metaphorical association, the method was shown to expand the emotional dimension of design inquiry in the furniture domain. It enhanced the contextual relevance and perceived user value of design outcomes. The resulting HVM was shown in this work not only to help in product optimization and innovation, but also to serve as a tool for identifying value-driven opportunity spaces within the market.
3. It should be noted that this study focused on the psychological mechanisms behind users' emotional and value-based engagement with wooden furniture, and therefore did not incorporate objective measurements such as ergonomic parameters or human posture simulations. Future research could broaden the participant base—for example, including elderly users or workplace scenarios—and integrate multimodal data sources such as EEG and eye-tracking. These efforts would offer technical validation of visual metaphor-driven design strategies and contribute to the development of a more robust methodology for emotion-centered furniture design.

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APPENDIX

Table S1. Summary of Participant Interviews (Step 1)

Number	Image	Interview Notes
01		Q: What elements in this image relate to your ideal lounge chair? A: The thin rope handle suggests it's easy to carry and doesn't take up much space. Q: Is portability important to you? Why? A: Yes, it's convenient for moving or traveling. Q: What does convenience mean to you? A: (Example) When I move apartments, I won't waste energy or hesitate about discarding it. Q: What does saving time and effort mean to you? A: It brings ease and freedom.
	Concept	Lightweight; Portable; Saving time and effort; Ease and freedom
02		Q: What elements in this image relate to a good lounge chair? A: Sitting on it feels like floating on a soft cloud. Q: Is the softness of the material important? Why? A: It's skin-friendly and feels very comfortable. Q: What does skin-friendliness mean to you? A: It means comfort, which makes me use it often. Q: Frequent use indicates what? A: It shows I like or rely on the product. Q: Is reliance and enjoyment important? Why? A: A reassuring product helps me enjoy life.
	Concept	Soft surface; Skin-friendly; Comfortable; Sense of reliance; Enjoying life
03		Q: What elements relate to your ideal chair? A: Foldable, portable, space-saving. Q: Why is space-saving important? A: My apartment is small. Q: Would you choose a larger chair if you had more space? A: Probably not. I prefer compact, refined items. Q: What does compactness mean to you? A: It's a lifestyle—simple and elegant. Q: How do you define this attitude? A: It reflects minimalism and taste: "less is more."
	Concept	Compact form; Space-saving; Lifestyle; Simple and comfortable; Tastefulness
04		Q: What in this image relates to the ideal chair? A: It provides a private space for undisturbed personal time. Q: Why is this space important? A: It allows quiet reflection and meditation. Q: Do you value privacy? Why? A: Yes. At home I want to mentally unwind. Q: How does that relate to chairs? A: Being enveloped by the chair helps me relax and feel secure.
	Concept	Privacy; Undisturbed; Enveloped feeling; Mental release; Relaxation and security
05		Q: What stands out in this image? A: It has a cyberpunk vibe; trendy color scheme. Q: What do the colors mean to you? A: They're stylish. Chairs shouldn't be dull. Q: What does being trendy mean? A: Individuality! Q: Why do you value uniqueness? A: It shows personal taste and character.
	Concept	Fashionable color; Trendy; Individuality; Tasteful; Self-expression

Table S1. (Continued) Summary of Participant Interviews (Step 1)

Number	Picture	Interview Notes
06		Q: What element relates to the theme? A: The chair should be more than just a seat. Q: What do you mean? A: I plan to get a pet. If my pet likes the chair, I'll like it more. Q: Is "shared use with pets" important? A: Yes, it becomes a medium for bonding. Q: What does bonding with pets mean to you? A: It gives me a sense of companionship, like home.
	Concept	Multifunctionality; Shared with pets; Companionship; Sense of home; Warmth
07		Q: What element relates to the chair theme? A: Sitting too long hurts my back, but I'm lazy to exercise. Q: What does health mean to you? A: A good chair keeps me healthy so I can enjoy life. Q: What would you do with good health? A: Go out on weekends to relieve fatigue. Q: How does that impact your lifestyle? A: It improves mood and keeps me optimistic.
	Concept	Health; Relieving fatigue; Good mood; Optimism
08		Q: What in this image relates to your ideal chair? A: Like slouching comfortably ("Ge You" style) — very relaxing. Q: What does that comfort mean to you? A: True relaxation — physical and emotional relief.
	Concept	Unrestricted posture; Comfort; Stress relief; Freedom
09		Q: What stands out in this image? A: Like a seed sprouting — when I sit, I feel stretched. A light green tone would be perfect. Q: What does body stretching mean? A: Helps avoid hunching, makes me look tall. Q: Why care about posture? A: Makes people like me. I feel attractive. Q: Can you describe the feeling? A: It boosts my mood and enhances creativity.
	Concept	Stretchability; Upright posture; Pleasant feeling; Good mood; Creativity & productivity
10		Q: What elements relate to your ideal chair? A: It has Chinese aesthetics — elegant colors and a modern mix of tradition and metal. Q: What do traditional elements mean to you? A: Balance between old and new — inclusiveness. Q: What do you mean by inclusiveness? A: Openness without being showy or outdated — harmony. Q: What does harmony mean? A: Beauty and peace of mind.
	Concept	Chinese aesthetics; Harmonious color; Inclusive; Balanced; Peace of mind