

Beyond Interaction: Examining Brand Social Intimacy in Human-AI Relationships

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Social intimacy refers to high-quality interactions and close relationships with significant others, including spouses, friends, and family members (Miller & Lefcourt, 1982). In today's digitally connected environment, individuals are embedded in social media and online networks, which significantly influence intimate interactions, engagement, and information exchange (Zhang & Ling, 2015).

With the increasing integration of artificial intelligence (AI) in social and consumer interactions, research on human-AI relationships has gained traction in behavioral science. Recent studies primarily explore AI's role as an interaction partner and its impact on consumer behavior (Williams & Lim, 2024). For instance, some consumers prefer interacting with AI-powered chatbots over human service agents in purchase contexts, particularly when self-presentation concerns arise, such as avoiding embarrassment (Jin et al., 2024). As AI becomes an integral part of social interactions, the nature of consumer-AI relationships is drawing increasing interest in the field of marketing and consumer psychology (e.g., Liu-Thompkins et al., 2022).

Positive social interaction is fundamental to maintaining high-quality interpersonal relationships, including friendships and consumer-brand relationships (Lopes et al., 2004). Research suggests that social interaction and intimacy function together to foster securely attached close relationships (Kafetsios & Nezlek, 2002). However, little research has

examined how these social dynamics extend to human-AI close relationships, particularly in the context of consumer engagement with AI services.

Existing research on human-AI interactions primarily focuses on trust (e.g., Poushneh, 2021), AI service adoption (Park et al., 2021), and the functional attributes of AI (Hoddinghaus et al., 2021). However, there is a lack of a structured scale to assess brand social intimacy between humans and AI services.

This study addresses this research gap by employing a qualitative approach to develop a scale measuring AI-human social interactions. Using Grounded Theory, this research aims to construct a theoretical framework, while Thematic Analysis is applied for structured item generation. By integrating qualitative insights into scale development, this study contributes to both theoretical advancements in AI-human interaction and practical implications for AI-driven consumer engagement.

Social Intimacy

Close relationships, such as friendships, are voluntary social connections that provide valuable insights into bond formation and intimacy development (Matteucci et al., 2022). Social intimate connectedness, a key dimension of intimacy, shares the same theoretical foundation as emotional connectedness, emphasizing mutual understanding and shared experiences as essential components.

In the context of human-AI interaction, social connectedness is influenced by shared experiences. Research suggests that these experiences enhance feelings of closeness, shaping perceptions of intimacy and relationship quality (Frost & LeBlanc, 2021). This aligns with Miller's Social Intimacy Scale, which identifies key indicators of intimacy, such as "spending time together" and "frequency of contact" (Hogan et al., 2021). The more time individuals engage with an AI system, the greater the opportunity for emotional bonding and perceived closeness, ultimately influencing relationship satisfaction (Cassepp-Borges, 2023).

Social Interaction and Rapport in AI Engagement

Social interaction plays a fundamental role in fostering social rapport, which refers to positive interpersonal connections built on care, understanding, and emotional bonding (Yim et al., 2008). Traditionally studied in human-human interactions, social rapport is critical in customer-firm relationships, where affective bonds drive trust, satisfaction, and loyalty (Gremler & Gwinner, 2000).

Recent research has extended the concept of rapport to AI-human interactions, suggesting that AI can elicit emotional and relational engagement similar to human agents (Huang et al., 2011). In consumer settings, social rapport with AI services influences user satisfaction, engagement, and trust (Baker et al., 2020). This research applies Yim's framework of social rapport to the context of AI-human intimacy, examining how emotional engagement and mutual connection emerge in AI-driven interactions.

Given its central role in fostering meaningful social experiences, social rapport is categorized under the social intimacy dimension of this study. By integrating human-AI social engagement, this research contributes to a deeper understanding of how consumers form social intimacy bonds with AI systems, expanding existing theories on social intimacy in digital environments.

Methodology

Data collection

The study began by reviewing ten influential social intimacy scales. Based on the characteristics of human-AI interaction, three key scales were selected based on the current feature and characteristics of human and AI interactions:

1. Personal Assessment of Intimacy in Relationships (PAIR) – Social Intimacy Subscale (Schaefer & Olson, 1981)
2. Social Intimacy Scale (MSIS) (Miller & Lefcourt, 1982)
3. Customer-Firm Affection Scale (Yim et al., 2008)

Following this selection, semi-structured in-depth interviews (N=15) were conducted to explore how these scales apply to human-AI relationships.

Personal Assessment of Intimacy in Relationships (PAIR)

The PAIR inventory measures intimacy across emotional, social, sexual, intellectual, recreational, and conventional dimensions. In this study, 30 items from five subscales (emotional, social, sexual, intellectual, and recreational) were used to assess both perceived and expected intimacy. Participants rated their experiences on a 5-point Likert scale, with higher scores indicating greater intimacy.

Social intimacy, as defined in PAIR, refers to shared social networks and mutual acquaintances. Interview findings indicate that AI interactions often serve companionship, mutual enjoyment, and social validation (e.g., "my friends also use AI").

Social Intimacy Scale (MSIS)

The MSIS is a widely validated tool for measuring interpersonal social intimacy. It has been applied in various contexts, including young users' relationships with digital entities (Zhang et al., 2023) and social integration within virtual communities (Zhang et al., 2022). Prekatsounaki et al. (2020) further validated its use in studying close human relationships.

Originally designed to measure the psychological significance of personal closeness, MSIS consists of 17 items divided into two dimensions:

1. **Frequency of Contact** – Research suggests frequent AI interactions foster familiarity and intimacy (Onofrei, 2022).
2. **Intensity of Intimacy** – This dimension includes confiding, affection, disagreement, and perceived relationship importance. Higher scores indicate deeper intimacy, which may influence user engagement and emotional attachment to AI.

Customer-Firm Affection Scale

The Customer-Firm Affection Scale extends traditional satisfaction, trust, and loyalty models by incorporating emotional attachment, particularly intimacy and passion, in service relationships (Yim et al., 2008). It integrates Sternberg's triangular theory of love and attachment theory, applying concepts such as:

- Love/intimacy/commitment of products
- Love/intimacy/commitment of brands
- Love/commitment of service firms

This scale includes nine constructs: service quality, customer satisfaction, firm trust, firm loyalty intentions, social rapport, staff trust, staff loyalty intentions, share of purchase intentions, and customer-firm affection.

Social rapport, which involves positive interpersonal connections and mutual understanding (Angelo, 2015), is particularly relevant for human-AI intimacy. The social rapport construct from Yim et al.'s research aligns with the concept of social intimacy in human-AI interactions.

Interview

This study employed semi-structured interviews with 15 marketing professionals (both full-time and part-time) to explore their daily interactions and relationships with AI services. Interviews were conducted online via Zoom, with audio and video recordings collected for analysis.

A thematic coding approach was applied to identify patterns and emerging themes, including those not previously discussed in the literature. Data collection continued until theoretical saturation was reached, ensuring no new insights emerged from additional interviews.

Data analysis

The data analysis followed a **four-stage approach**:

1. Literature Review – Identified existing constructs from human-to-human social intimacy scales to inform the initial coding framework.
2. Open Coding – Extracted key concepts directly from the interview data.
3. Axial Coding – Refined and categorized key concepts into broader themes.

4. Selective Coding – Developed a theoretical model explaining human-AI social intimacy.

This integrative approach combined theoretical insights with empirical findings, ensuring a systematic scale development process.

To develop the item pool, a comprehensive literature review of 25 existing intimacy scales was conducted, from which three highly relevant scales were selected. Additionally, semi-structured interviews were conducted with 10 participants and 5 experts to explore perceptions and experiences of social intimacy in human-AI interactions.

Some original items were eliminated where the interaction context did not align with human-AI relationships. The literature review yielded 27 initial items, categorized into three main dimensions: social rapport, interaction intensity, and social interaction. Thematic analysis of interview data further identified two emergent constructs: social companionship and leisure activities engagement.

Open Coding

The interview data was transcribed using the AI-generated tool Descript, followed by a second revision and manual verification against the recorded interview videos. Repetitive properties and redundant concepts were excluded from the final transcript (Chopra, 2019). Each theme was examined systematically to understand participants' social intimate behavior with commercial AI tools.

Axial Coding

The key concepts identified in open coding were grouped and categorized into higher-order constructs, allowing for a more structured understanding of human-AI social intimacy.

Selective Coding

The themes created during the axial coding process were carefully examined to help summarize the underlying meaning of the data, particularly the core constructs of social engagement and social bonding. These constructs were identified as central to understanding the ways in which participants engage socially with AI. Based on the literature review, three primary constructs emerged: social rapport, interaction intensity, and social interaction, which together form the foundation of brand social intimacy in human and AI relationships. Furthermore, two additional constructs, social bonding and social engagement, emerged in response to new patterns observed in the data. These constructs corresponded with emerging themes of social companionship and engagement in leisure activities, highlighting the multifaceted nature of social interactions in the context of human and AI close relationships.This hybrid approach combining literature-driven constructs with empirical findings from qualitative analysis; enhanced the theoretical depth of the study, ensuring a comprehensive framework for brand social intimacy in human-AI relationships.

Result

The qualitative analysis of the interviews revealed two key emergent themes: Social Companionship and Leisure Engagement. These constructs were not addressed in existing human-AI social intimacy scales, highlighting a gap in current measurement tools for AI-human interactions.

Theme 1: Social Companionship

Social companionship refers to a pleasant, accessible relationship fostered by a social and emotional investment that requires trust, compatibility, and results in feelings of security and overall well-being (Benyon & Mival). In this research, social companionship is closely related to social bonding. Existing AI programs offer social and emotional support (Provoost et al., 2017), aiming to establish human-AI bonds (Darcy et al., 2021). Interview findings support this, as participants highlighted that AI's accessibility and availability help reduce loneliness and provide a sense of companionship.

Theme 2: Leisure Activities Engagement

Leisure activities engagement can broaden social support networks, where groups and individuals create strategies to address their needs (Rodriguez & Ferreira, 2018). Such engagement encourages active and productive participation, enjoyment, and other positive experiences, ultimately enhancing social network engagement and fostering loyal user communities (Wenzel et al., 2024). Interview data revealed that users are eager to share and engage with AI within community settings, creating digital communities centered around shared activities.

Theme	**Construct**	**Initial codes (open coding) example**
Social companionship	Social bonding	"When the people (I want to talk with) are not available… AI is there…and reduce my loneliness."
Leisure activities engagement	Social network engagement	"I asked AI image generator (to create some art) and I need to share this to gamer group , or other types of communities online"

Social intimacy dimensions were extracted from the social intimacy categories of previous scales. All items were initially developed based on human-to-human interactions and relationships.

Due to the unique nature of human-AI interactions, some items were adjusted to reflect the current capabilities of AI, leading to the elimination of items that were not applicable. For instance, items such as “I don't think anyone could possibly be happier than my partner and I when we are with one another” (PAIR) and “How often are you able to understand his/her feelings?” (MSIS) were excluded. These items specifically involve feelings related to a human partner, while AI does not possess human-like emotions or artificial consciousness (Farisco et al., 2024). Therefore, these items were deemed irrelevant to the present study.

Drawing from existing scales and incorporating the two newly identified constructs, this research consolidates five constructs with a total of 27 items, with each construct containing approximately 5-6 items to assess brand social intimacy in human-AI relationships:

1. Social Rapport (consumer-firm affection scale)
2. Interaction Intensity (MSIS)
3. Social Interaction (PAIR/MISI)
4. Social Bonding (Interview result)
5. Social Network Engagement (Interview result)

Implications

Existing scales primarily focus on social intensity, social intimacy, and other emotional aspects of human-human interactions. Few studies have explored brand social intimacy in the context of human-AI relationships. This research introduces two novel social intimacy themes—social companionship and leisure activities engagement—which are categorized under social bonding and social network engagement. These dimensions remain underexplored in current AI relationship studies. This finding helps to understand that AI, as a social agent, influences consumer behavior and emotions in a social context, integrates marketing psychology perspectives, provide a holistic view of human-AI relationships

This research underscores the significance of brand social intimacy in human-AI relationships. It suggests that AI developers can enhance AI capabilities and foster social bonding by building communities that promote engagement and, in turn, enhance user loyalty.

Future directions

Future research could further validate the scale through quantitative methods, including factor analysis (e.g., EFA and SEM**).** Additionally**,** a cross-cultural analysis could be conducted, comparing responses from Western and Eastern countries to enhance the diversity and robustness of the sample.

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