Emotional Reactions and Kansei Cognition of Weibo Users Towards ChatGPT

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Abstract. Focusing on the individual level, this study selects text data from individuals on the Weibo platform since the release of ChatGPT 4.0 as the research sample. It employs the Gephi network analysis tool and sentiment analysis methods, aiming to explore individuals' kansei cognition of ChatGPT and their emotional responses. Drawing from the perspective of imprinting theory, this research illustrates how individuals' kansei cognition of ChatGPT is shaped through a combination of four dimensions: ethics, R&D, consciousness, and production. It further analyzes how this perception influences individuals' emotional responses. Additionally, this study refines the binary classification of emotional responses (i.e., positive and negative emotions) found in existing literature, introducing a subdivision of neutral emotions into positive and negative nuances based on the reinforcement and modulation of kansei cognition. Through this classification, the study enhances existing theories of affective response and offers new theoretical insights.

Keywords: ChatGPT; kansei cognition; emotional response; imprinting theory; sentiment analysis.

1 Introduction

The launch of ChatGPT 4.0 has significantly influenced the field of generative AI, transitioning the perception of media from mere 'toys' to reflective 'mirrors'[1], as characterized by Levinson (1977). This leap in digital language processing technology has seen widespread adoption, with machines increasingly assuming roles traditionally held by humans in communication contexts. The swift progression of technology has not only heightened people's curiosity and dependence on technological innovations but has also profoundly altered their emotional responses. Examining the impact of generative AI tools on individuals can deepen our understanding and offer a nuanced micro-level perspective that complements broader macro-level research. This paper concentrates on the experiences of individual users, analyzing discussions from a microblogging platform as the research basis. Utilizing the Gephi tool and sentiment analysis methods, it investigates the dimensions of individuals' kansei cognition and their emotional response patterns amid the technological surge spearheaded by ChatGPT,

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through the lens of imprinting theory. The goal is to elucidate the kansei cognitive and emotional mechanisms individuals develop throughout the digital transformation process.

2 Literature Review and Research Questions

The concept of kansei, derived from kansei theory, is pivotal in understanding emotional responses related to technical tools. It describes the complex process by which an individual's sensory integration and cognition establish an emotional connection with an object or scenario [2] (Ishihara et al., 2008). In the realm of social robots and technological interfaces, kansei cognition has been profoundly influenced, as these technologies possess emotional attributes that mold user perceptions [3] (Gan et al., 2021). Therefore, investigating how individuals emotionally perceive and engage with technological entities like ChatGPT is of significant academic interest.

Emotions in interactions with technology are recognized to extend beyond direct interaction; anticipated use can also provoke emotional evaluations and responses [4] (Hudlicka, 2015). This phenomenon is especially prominent in encounters with robots or AI entities, which have been shown to elicit emotional attachments in humans [5, 6] (Krämer et al., 2011; Rosenthal-von der Pütten et al., 2013). Understanding affective attitudes towards AI, such as ChatGPT 4.0—known for its advanced dialogue processing—is crucial for exploring the psychosocial dynamics of human-computer interactions [7] (DeSteno et al., 2004). This study aims to examine the emotional responses to ChatGPT 4.0, seeking to identify whether it elicits a range of emotions beyond the simple binary of positive or negative.

From a theoretical standpoint, imprinting theory—originally from biology and later applied to various fields such as organizational studies and career research [8, 9, 10, 11] (Battilana, 2006; Higgins, 2005; Johnson, 2007; Marquis & Huang, 2010)—provides a framework to understand stable behavioral patterns established during critical periods. Imprinting theory encompasses cognitive and structural dimensions; the former influences strategic cognition, while the latter pertains to the foundational elements of learning and perception [12, 13] (Snihur & Zott, 2019; McEvily et al., 2012). This paper leverages imprinting theory to explore the effects of generative AI, like ChatGPT, on individuals by analyzing social media expressions from the release of ChatGPT 4.0 up to October 24, 2023. Utilizing sentiment analysis with the Gephi tool to examine 2,199 text data points, the study seeks to enhance our understanding of the affective imprint AI technologies leave on users.

3 Data presentation

Individual Kansei on ChatGPT.

For this study, we selected the top one-third of words by frequency from 2,199 samples, creating a high-frequency word co-occurrence matrix based on the analyzed samples. We utilized Gephi software to generate a social semantic network map of emotions, eliminating node links with low relevance (see Figure 1). The network diagram

reveals that emotional responses to ChatGPT are shaped by various factors, including social efficiency, future development prospects, technological applications, changes in daily life, cognitive styles, media evolution, and potential threats. The language is clear, objective, and neutral, avoiding any biased or emotional expressions. The sentence structure is straightforward, and technical terms are used consistently. The text is free of grammatical, spelling, and punctuation errors. No content has been altered.

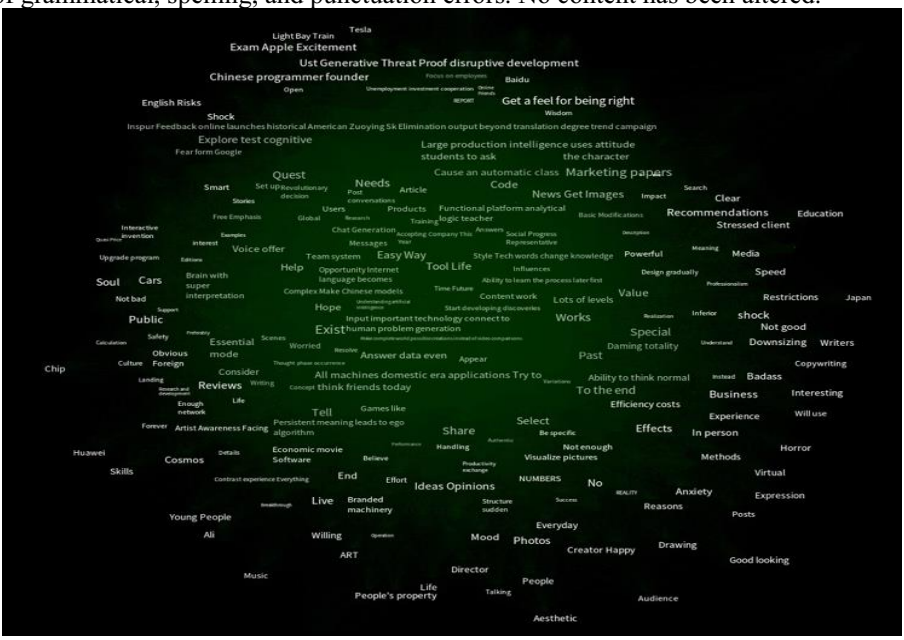

Fig. 1. Social semantics of emotional network graph

Individuals' Emotional Responses to ChatGPT.

The data in Table 1 indicate a predominantly positive distribution of emotional responses towards ChatGPT, encompassing positive, neutral, and negative emotions. On the whole, individuals tend to respond positively to ChatGPT, with texts expressing positive emotions being approximately twice as frequent as those expressing negative emotions.

Table 1. Statistical Results of Sentiment Analysis

Emotional categories	All		Low		Medium		High	
	Number	Proportion	Number	Proportion	Number	Proportion	Number	Proportion
Positive	654	53.43%	561	85.78%	65	9.94%	28	4.28%
Neutral	226	18.46%						
Negative	344	28.10%	320	93.02%	21	6.10%	3	0.87%

4 Conclusions

4.1 A Kansei Inferential Deconstruction Based on Cognitive Imprinting Processes

This study examines the interaction with ChatGPT as a critical period, emphasizing the pivotal role of 'time' in molding an individual's attitude and perception. The analysis indicates that the development of individual kansei is shaped by past experiences and is influenced by four dimensions: ethics, research and development, consciousness, and production. The interplay among these dimensions generates varying degrees of tension, which collectively leave a generalized cognitive imprint on the individual.

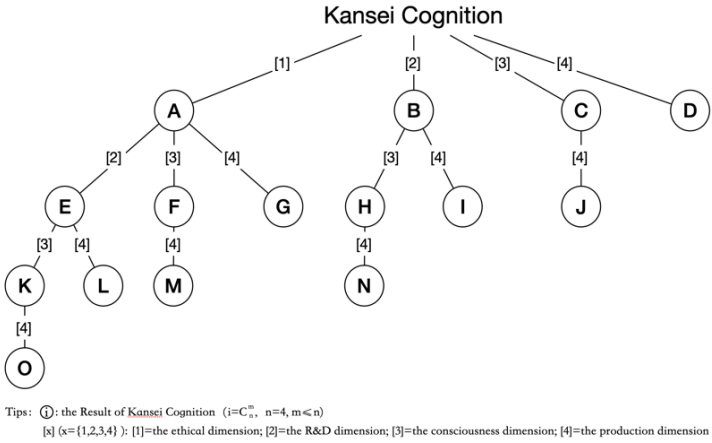

Fig. 2. Dimensions of Individuals' Kansei Cognition Combinations for ChatGPT

In summary, during critical periods, individuals' perceptual knowledge and kansei cognition towards ChatGPT are shaped by various factors. This indicates that kansei cognition results from a multitude of influences. Consequently, this paper introduces a model named the 'Multidimensional Involvement Model of Individuals' Kansei of ChatGPT' (see Figure 2). According to this model, individuals engage multiple dimensions in the cognitive imprinting process, including ethics, research and development, consciousness, and production, leading to varied kansei cognition outcomes. For example, if an individual's perception of ChatGPT is solely based on its ethical dimension, the resulting perception is labeled as A (i.e., [1]). If it includes the research and development dimension, the outcome is identified as E (i.e., [2]). Moreover, when both the consciousness (i.e., [3]) and production dimensions (i.e., [4]) are involved, the outcome remains E. This multidimensional approach suggests that the formation of kansei cognition when interacting with imprinting technologies like ChatGPT is affected by a blend of factors. Each dimension reveals distinct cognitive and emotional responses individuals have when engaging with advanced technology, culminating in diverse cognitive outcomes. This model provides a comprehensive understanding of the complex psychological processes occurring as individuals engage with generative AI

technologies like ChatGPT. The analysis highlights the variety and complexity of individual cognitive processes, enriching our understanding of how generative AI technologies influence human cognition and emotions.

4.2 Reconstructing Individual Emotional Responses Based on Structural Imprints

Once a cognitive imprint is established, the entity bearing the imprint undergoes a process known as structural imprinting. Structural imprints are fixed patterns instilled by the imprinter within the entity, which can be categorized into various types. The diverse affective responses individuals exhibit towards ChatGPT serve as examples of structural imprints, with variations in these responses leading to differences in the structural imprints themselves. In previous research, Larsen and McGraw (2011) argued that positive and negative emotions as dichotomies of emotions cannot coexist [14]. However, this paper's data screening and analysis reveal a complex phenomenon in individuals' affective responses to ChatGPT. This complexity is characterized by the coexistence of negative and positive emotions, underscoring the nuanced nature of structural imprinting.

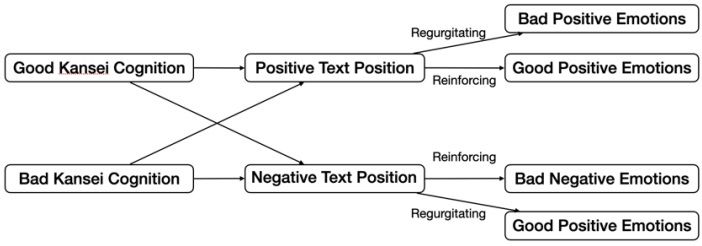

Fig. 3. Pathways for Generating Individual Emotional Response to ChatGPT

During the structural imprinting process, the cognitive imprint and the affective expression of the imprinted entity intertwine to form the structural imprint, manifesting as the individual's affective response. This study categorizes emotional responses into four dimensions: positive emotions, negative emotions, good positive emotions, and negative positive emotions. It outlines the pathway of emotional responses (see Figure 3) to more effectively depict the representation of complex structural imprints produced by the imprinted entity on the imprinting source throughout the structural imprinting process.

The public is currently experiencing a significant shift from an industrial civilization to a digital civilization. This transformation entails dismantling the old world and establishing a new one through systematic and ecological reconstruction. Consequently, individuals are compelled to step out of their previous 'comfort zone' and venture into a new era characterized by uncertainties and developmental variables. It is crucial to explore how the impact of generative AI, such as ChatGPT, on the public will unfold in the future.

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