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Determining the Validity of Generative Artificial Intelligence (GenAI) for Emotional Perception and Decision-Making

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ABSTRACT

With the rapid advancement of Generative Artificial Intelligence (GenAI) powered by Large Language Models (LLMs), its emotion-related capabilities have garnered increasing attention and are being progressively applied across various industries.

This paper focuses on four prominent GenAI LLMs—GPT-4o, Doubao, Kimi, and DeepSeek—to analyze their emotional perception and emotional decision-making capabilities during text reading. The research evaluates the similarity between GenAI LLMs and humans in these aspects and explores the boundaries of this similarity. The findings reveal that the emotional perception abilities of current GenAI have achieved a high level of consistency with humans overall, and this consistency strengthens as the emotional intensity of the text increases. However, great differences exist among the performances of different GenAI LLMs. Moreover, in one-round emotional decision-making, GenAI performs commendably, but their abilities in attributing the source of emotions does not surpass that of humans, and they fail to effectively mitigate the influence of incidental emotions in decision-making. In contrast, in multi-round emotional decision-making, GenAI demonstrates exceptional emotional regulation capabilities, significantly reducing the accumulation effects of emotions. Notably, the consistency and similarity between GenAI and humans in emotional perception and decision-making has its boundary: when the texts used to evoke emotions are confined to the field of highly innovative innovations, this consistency and similarity disappear, and GenAI exhibits a stronger inclination toward encouraging innovation and maintains a positive attitude. This paper provides new theoretical foundations and practical insights for the application of GenAI in emotion-related domains.

Keywords: Generative Artificial Intelligence (GenAI), Large Language Model (LLM), emotional perception, emotional decision-making, ability in attributing the source of emotions, emotional regulation

1. Introduction

1.1 Research Background

Generative Artificial Intelligence (GenAI) refers to computational techniques that are capable of generating seemingly new, meaningful content such as text, images, or audio from training data (Feuerriegel 2024). It is an Artificial Intelligence (AI) technology capable of generating new data samples by learning the underlying patterns in the existing data, which allows machines to become more intelligent.

In the era of large language models (LLMs), LLM-based GenAI has achieved remarkable breakthroughs in natural language processing. This transformation began with Google's introduction of the Transformer architecture (Vaswani et al. 2017), whose self-attention mechanism significantly improved models' ability to process long texts and complex language tasks. Building on this foundation, OpenAI released GPT-3 (Brown et al. 2020), which demonstrated human-like or even superior performance in illustration-based tasks, decision-making, and multi-armed bandit problems. However, GPT-3 lacked directed exploration, resulting in weaker performance in causal reasoning tasks (Binz and Schulz 2023). Subsequently, OpenAI introduced ChatGPT (based on GPT-3.5 model), marking a significant leap forward. ChatGPT exhibited exceptional capabilities in multimodal (language and image) understanding, text generation, reasoning, creativity, and knowledge-based planning (Wu et al. 2023). It quickly became a groundbreaking GenAI product, widely recognized as a versatile tool for various applications (Qin et al. 2023). In 2023, OpenAI released GPT-4, which achieved a 75% success rate in bespoke false-belief tasks designed to assess theory of mind (ToM) in humans, matching the performance of six-year-old children (Kosinski 2024).

The rapid evolution of LLM-based GenAI, exemplified by OpenAI's GPT series, has led to substantial improvements in performance, larger context windows, enhanced memory capabilities, faster processing speeds, and lower costs (Korinek 2024). These advancements have driven widespread adoption across diverse domains, including multimodal applications, robotics, tool manipulation, question answering, and autonomous agents (Naveed et al. 2023).

Today, LLM-based GenAI has become an indispensable technology, with widespread adoption in both professional and personal settings. Its usage has even outpaced that of computers in non-work environments (Bick et al. 2024). In this paper, "GenAI" specifically refers to LLM-based GenAI.

Against this backdrop, the GenAI market in China is thriving, with major companies such as Baidu, Alibaba, ByteDance and Tencent launching their own GenAI LLMs, such as the ERNIE series and Doubao series. A large number of startups have also achieved remarkable success. For example, Kimi, developed by Moonshot, received widespread acclaim for its exceptional ability to process long texts. The academic community is also actively involved in GenAI research, with notable contributions such as MOSS from Fudan University. To foster rapid innovation and technological advancement in GenAI, numerous open-source GenAI LLMs have emerged, including the Yi series from 01.AI and the Baichuan series from Baichuan AI.

Thus, China has witnessed a nationwide surge in the adoption of GenAI. According to the 2024 AIGC Application Development Annual Report (QuestMobile 2025) by QuestMobile, a leading business intelligence data provider in China, the number of GenAI app users has surged, surpassing 100 million in November 2024 and reaching 120 million in December. By then, the GenAIs with the highest Monthly Active Users (MAU) in China were Doubao (Volcengine 2023) and Kimi (Moonshot 2023). However, in January 2025, DeepSeek launched its GenAI model R1 (DeepSeek-AI 2025). Within just one month, it was downloaded over 110 million times, with weekly active users rapidly reaching nearly 97 million, quickly becoming one of the most welcomed GenAI platforms both in China and globally.

Figure 1: GenAI app MAU and YoY growth rate[1]

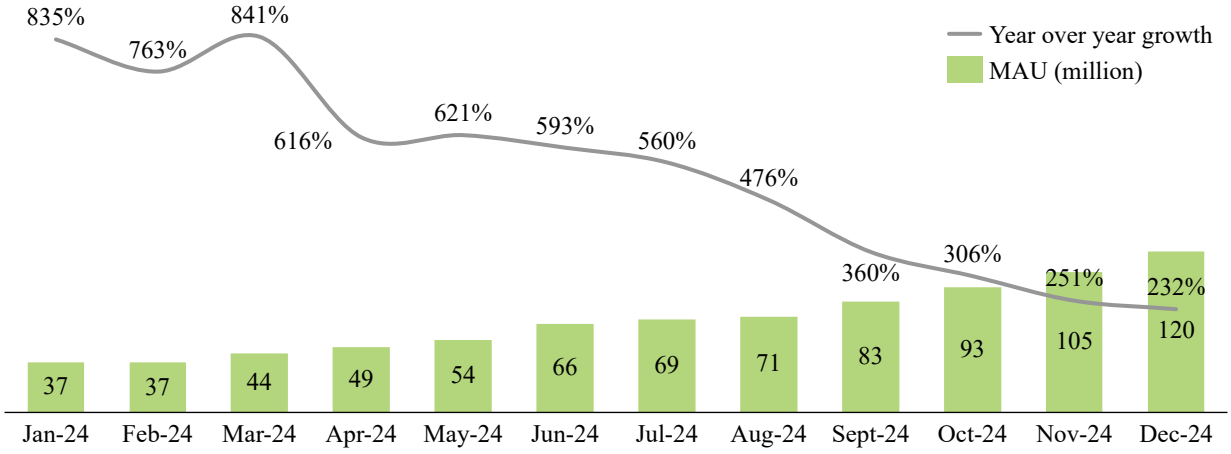
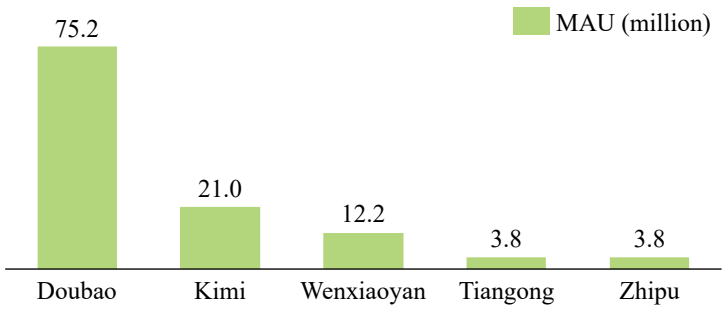


Figure 2: GenAIs with the highest MAU by the end of 2024[1]

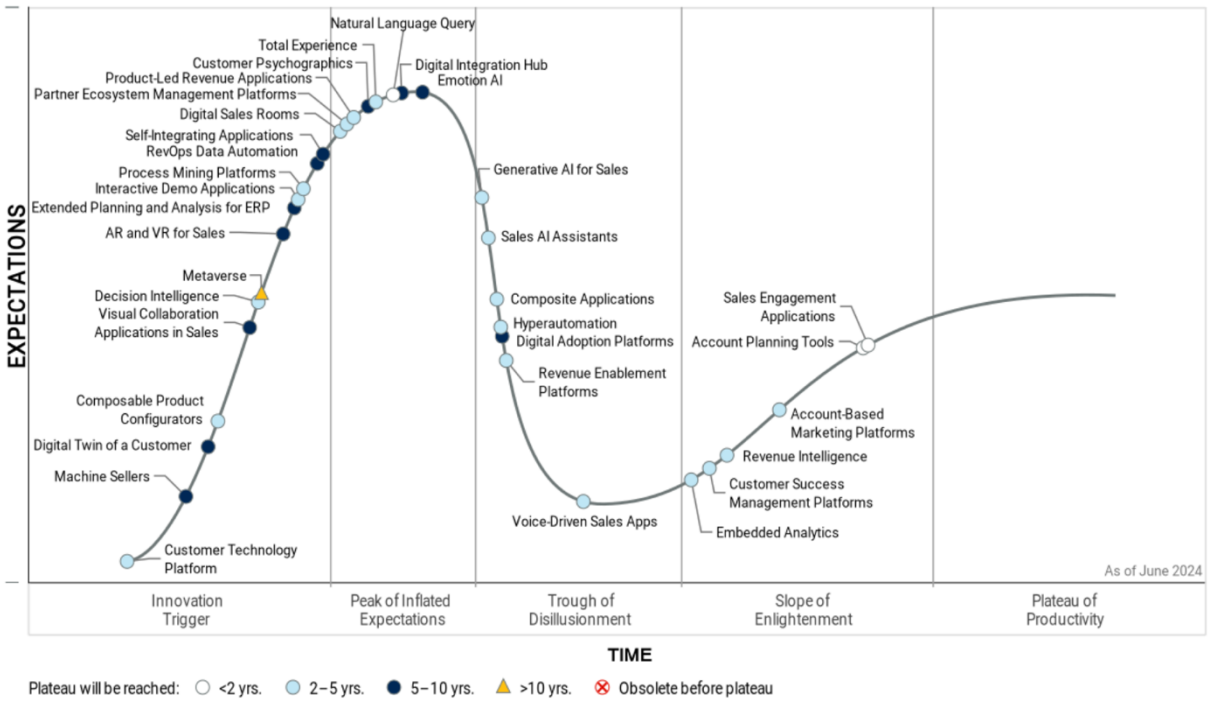


In addition to general work support, the potential of GenAI in human emotion recognition, perception, and decision-making has also been increasingly recognized and applied across various industries. For example, GenAI based facial expression recognition technology can now accurately analyze human facial expressions and infer emotions and is widely used in customer service, healthcare, and smart assistants. Specialized emotional intelligence assistants have also been developed to offer comfort, encouragement, or advice based on the user's emotional state, engaging in deep conversations to alleviate loneliness, and in some cases, providing psychological counseling. Particularly in the mental health field, GenAI is starting to be used for emotional monitoring and mood management, helping users alleviate negative emotions such as anxiety and

[1] Questmobile (2025), 2024 AIGC Application Development Annual Report, https://www.questmobile.com.cn/research/report/1881621126817353729

depression. Gartner, a leading technological research and consulting firm, has included Emotion AI—defined as the area of artificial intelligence where systems are designed to recognize, interpret, process, and simulate human emotions (Gartner 2025)—in its Hype Cycle for Revenue and Sales Technology. It categorizes Emotion AI as a technology with the potential to deliver transformative benefits within the next two to ten years and highlights its significant impact on sales functions (Gartner 2024).

Figure 3: Gartner hype cycle for revenue and sales technology, 2024[2]



However, while experts predict that GenAI's emotion-related technologies (such as sensory perception, social and emotional responses, reasoning, and sensing) will advance more rapidly than previously thought, reaching human-level performance is still anticipated between 2025 and 2030 (McKinsey 2023). Gartner also predicts that Emotion AI will take 5–10 years to reach its plateau (Gartner 2024). In academia, research on the emotion-related capabilities of GenAI remains limited, primarily focusing on emotional perception with relatively little exploration of

[2] Gartner (2024), "Gartner Hype Cycle Reveals Top Technologies That Will Transform Sales In the Next Decade," https://www.gartner.com/en/newsroom/press-releases/2024-08-27-gartner-hype-cycle-reveals-top-technologies-that-will-transform-sales-in-the-next-decade

specific nuanced emotions. Studies on GenAI's capabilities in emotional decision-making, attributing the source of emotions, and emotional regulation are even more scarce. As a result, guidance on the application of GenAI in the field of emotion remains quite limited.

1.2 Research Questions

As mentioned in 1.1, the application of GenAI in the emotion domain is continuously expanding, but the technology has not yet reached full maturity. In this context, determining the effectiveness of GenAI in achieving human-like emotional perception and decision-making becomes crucial. Firstly, it can enhance the naturalness and credibility of human-GenAI interactions, which is vital for fields like GenAI customer service, virtual assistants, and emotional companionship robots. If GenAI can process emotional information like humans in both emotional perception and decision-making, it would significantly improve user experience and acceptance in these systems. Secondly, exploring whether GenAI has superior ability in attributing the source of emotions and regulation capabilities beyond human ability is important. Not only would this confirm the potential of GenAI in service industries, but it would also contribute to addressing the ethical and safety concerns surrounding GenAI technologies. For instance, in emotionally sensitive scenarios (e.g., psychotherapy or eldercare), ensuring that GenAI's emotional responses meet ethical standards to avoid emotional manipulation or misguidance is crucial for the broader application of GenAI.

Therefore, the author has chosen to conduct experiments with four representative GenAIs (GPT-4o, Doubao, Kimi, and DeepSeek). The specific research questions are as follows:

First, can GenAI demonstrate human-like emotional perception of others and oneself? If so, does GenAI possess superior ability in attributing the source of emotions compared to humans?

Second, can GenAI make human-like one-round and multi-round emotional decisions? If so, does GenAI have superior emotional regulation abilities compared to humans?

Third, does GenAI's human-like emotional perception and decision-making have boundaries?

Forth, what practical lessons can developers and users of GenAI learn from this research?

1.3 Research Contributions

This paper aims to explore the capabilities of GenAI in emotional perception and decision-making, particularly in comparison to humans, and to identify the boundaries of these similarities. By addressing key gaps in existing literature, this study makes significant contributions to both theory and practice.

First, this paper evaluates GenAI's effectiveness in human-like emotional perception. Previous studies have primarily focused on GenAI's ability to recognize emotions in static text and images. This paper expands on that by testing GenAI's ability to perceive the "Big Six" emotions (Ekman et al. 1969) from text and comparing its emotional perception to that of humans. The paper not only replicates and validates the methodology used by previous research (Li et al. 2024) to assess the similarity between GenAI and human, but also introduces new metrics—Pearson Correlation, Cosine Similarity, and Jensen-Shannon Divergence (JSD)—to further analyze and cross-check the results, ensuring robust findings. Additionally, the paper investigates GenAI's ability to perceive its own emotions after reading text, a topic that has been largely unexplored in previous research.

Second, this paper evaluates the effectiveness of GenAI in human-like decision-making. Existing literature lacks definitive evidence that GenAI can achieve emotional decision-making in alignment with human standards. Furthermore, it has not yet distinguished the effects of incidental versus integral emotions on GenAI's decision-making, nor has it examined the impact of perceived opponent emotion on decision outcomes. This paper addresses these gaps by exploring these dynamics in the context of the dictator game, extending the work of previous research (Mozikov et al. 2024) on the influence of personal emotions and their sources on GenAI's and humans' decision-making. The paper also provides a reasonable explanation for the divergence between human behavior and previous literature and investigates whether GenAI possesses superior ability in attributing the source of emotions compared to humans. Additionally, this paper introduces a novel aspect, examining the effect of perceived opponent emotion on decision-making, and compares the similarities and differences between GenAI and humans in this regard.

Third, this paper enhances the understanding of GenAI's emotional regulation capabilities, exploring its potential to improve service quality in customer service scenarios by maintaining a consistently positive service attitude and professionalism, while minimizing the feedback and

accumulation effects of emotional responses to some extent. These aspects have received limited attention in previous research.

Fourth, this paper explores the boundary of similarity between GenAI and humans in emotional perception and decision-making. By narrowing the text reading from general stories and news to highly innovative innovation product descriptions, this paper identifies the limits of similarity between GenAI and humans in these areas, providing valuable insights for further development and upgrading of GenAI. Additionally, this paper explores the impact of the modality (text or text + image) used to evoke emotional perception and decision-making on this boundary.

In summary, this paper extends emotion-evoking text to Chinese, examines multiple emotion-related capabilities across various GenAIs, and compares their performance with humans. This study serves as a valuable extension and complement to existing literature.

Table 1: Overview of recent literature

Article	GenAI	Emotion	Emotional perception	Emotional decision-making	Ability in attributing the source of emotions	Emotional regulation	Experiment context	Main findings
This paper	GPT-4o Doubao Kimi DeepSeek	Positive (happiness) Negative (sadness, fear, anger, disgust) Ambiguous (surprise) No-emotion	✓	✓	✓	✓	General stories and news articles; Game; Customer service representatives; Highly innovative innovation	1. GenAI exhibits a high degree of similarity with humans in emotional perception and decision-making overall, but when confined to the field of highly innovative innovation, this similarity disappears. 2. GenAI's ability in attributing the source of emotions does not surpass that of humans. 3. GenAI demonstrates superior emotional regulation.
(Mozikov et al. 2024)	GPT-3.5 GPT-4	Positive (happiness) Negative (sadness, fear, anger, disgust) Ambiguous (surprise)	✓	✓	×	×	Game	1. GPT-3.5 exhibits alignment with humans, surpassing GPT-4. 2. GPT-4 generally operates as an intelligent and rational decision-maker, but it remains susceptible to the significant impact of anger, much like a human.

(Zhao et al. 2024)	GPT-3.5 GP-4	Positive (happiness) Negative (fear)	✓	✓	×	×	Investment; Prosocial behaviors	1. GPT-4 aligns closely with human while making investment decisions under the emotions of fear and joy. 2. GPT-4's donation amounts mirror human responses under anxiety. 3. These effects were not as pronounced in GPT-3.5.
(Li et al. 2023)	Flan-T5-Large Vicuna Llama 2 BLOOM GPT-3.5 GPT-4	✓	✓	×	×	×	-	1. GenAI possesses a certain level of emotional intelligence, and its performance can be enhanced through emotional prompts.
(Jia et al. 2024)	✓	×	×	×	×	×	Customer service representatives	1. GenAI can enhance employees' creativity, especially for highly skilled employees.
(Yin et al. 2024)	Bing Chat	Positive (happiness) Negative (sadness, fear, anger, disgust) Ambiguous (surprise)	✓	×	×	×	General stories	1. GenAI surpasses humans in detecting emotions. 2. Messages generated by GenAI make recipients feel more heard than those written by humans. However, awareness of GenAI reduces this feeling.
(Strachan et al. 2024)	Llama 2 GPT-3.5 GPT-4	✓	✓	×	×	×	Theory of mind	1. GPT models excel in tasks involving beliefs, with GPT-4

								surpassing human in sarcasm, implication, and bizarre stories. 2. GPT can interpret psychological states but avoids judgments when information is insufficient.
(Li et al. 2024)	GPTNeo GPT-4	×	×	×	×	×	Brands	1. GenAI tools can complement or even replace brand perception surveys. 2. GenAI-generated statements and scores can create perception maps matching human survey results.
(Vzorin et al. 2023)	GPT-4	Negative (oppression, depression, shame, Frustration) Ambiguous (shyness)	✓	×	×	×	General stories	1. GPT-4 is capable of identifying emotions, but it lacks deep reflexive analysis of emotional experiences and the motivational aspects of emotions.
(Huang et al. 2023)	Text-Davinci-003 GPT-3.5-Turbo GPT-4 LLaMA Mixtral	Negative (anger, anxiety, depression, frustration, jealousy, guilt, fear, embarrassment)	✓	×	×	×	General stories	1. GenAI generally exhibits appropriate emotional responses to given situations. 2. Different models vary in the intensity of emotional appraisals. 3. None of the GenAIs tested demonstrate strong alignment with human references.

(Croissant et al. 2024)	GPT-3.5-Turbo	Positive (happiness) Negative (anger, fear, boredom)	✓	×	×	×	General stories; Game	1. GenAI can perform emotion-labeling tasks, with performance depending on prompting. 2. GenAI has the potential to become an emotional game agent.

1.4 Research Methodology

This research combines both qualitative and quantitative analyses, guided by data from online experiments and automated data collection. In general, main research methodologies are listed as follow.

Literature review method. By reviewing both domestic and international literature on GenAI's capabilities in emotional perception and decision-making, alongside market research reports from financial institutions and consulting firms offering unique insights into GenAI's emotion-related capabilities and applications (particularly in interactions with humans), key theories and findings are summarized and refined. This strengthens the theoretical foundation and supports the development of hypotheses for this research.

Online experiment. The author conducted five online experiments to assess humans' emotional perception of others and themselves, as well as their decision-making performance in specific scenarios. These experiments provided human data for comparing and testing the similarities between GenAI and humans.

Automated Data Collection. The author accessed the official APIs of OpenAI GPT-4o (gpt-4o model), Kimi (Moonshot-v1-128k model), ByteDance Doubao (Doubao-vision-pro-32k model), and DeepSeek (deepseek-r1-14b model) to obtain data on GenAI's emotional perception of others and themselves, as well as their decision-making performance. This provided data from GenAI for comparing and testing the similarities between GenAI and humans.

1.5 Research Structure

This paper is structured into nine chapters to comprehensively address the research questions and derive key insights.

Chapter one introduces the research background, formulates the research questions and contributions, and provides a brief overview of the research methodology.

Chapter two presents theoretical background of this paper, including emotions and decision-making, and GenAI's emotion-related capabilities.

Chapter three develops the conceptual framework and five hypotheses, which are grounded in the theoretical background and further refined through the author's logical reasoning.

Chapter four details the process and findings of Study 1, which examines the similarity in emotional perception of others between GenAI and humans.

Chapter five presents the process and results of Study 2, focusing on the similarity in emotional perception of oneself between GenAI and humans

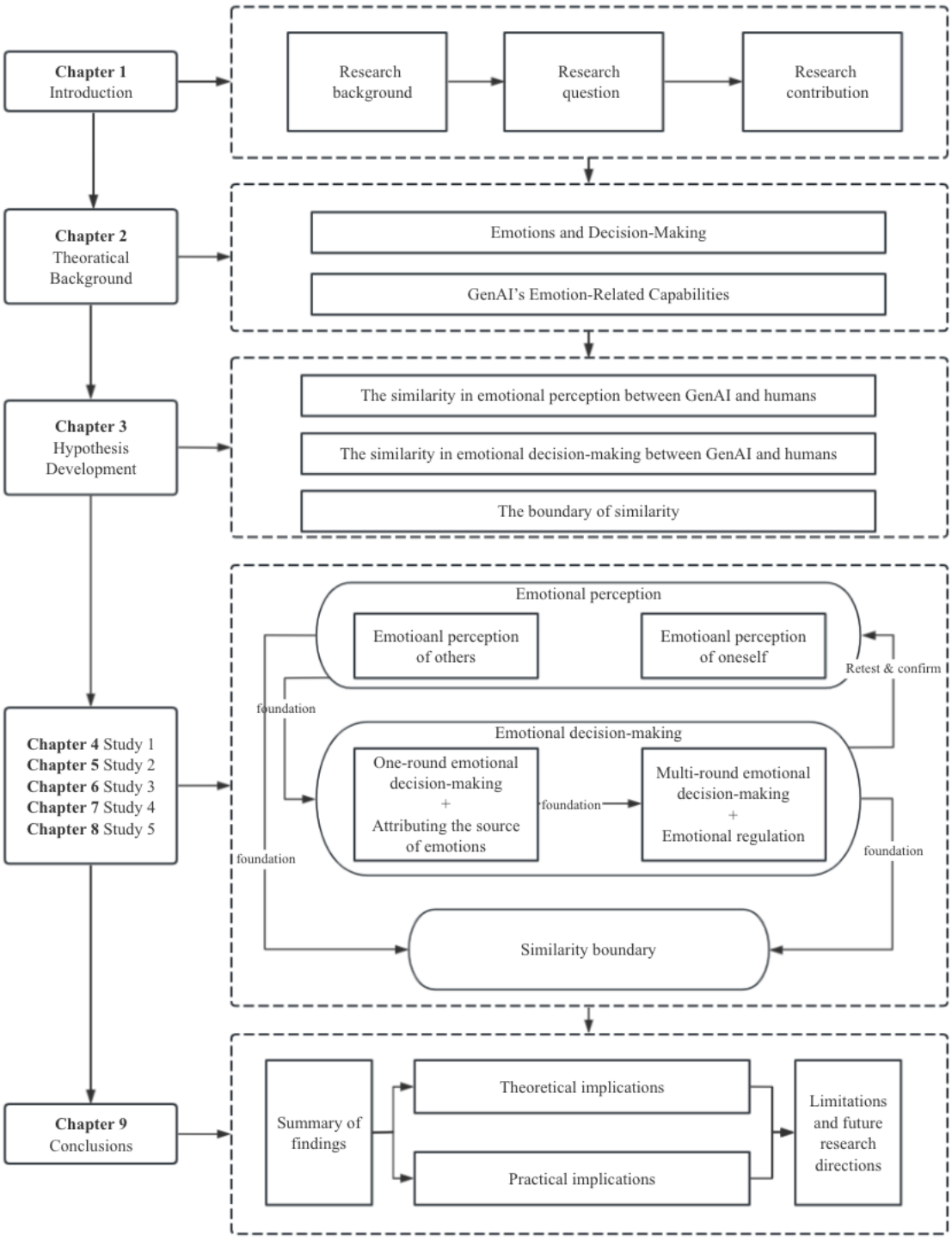
Chapter six outlines the process and findings of Study 3, which investigates the similarity in one-round emotional decision-making between GenAI and humans, as well as GenAI's ability in attributing the source of emotions.

Chapter seven covers the process and results of Study 4, exploring the similarity in multi-round emotional decision-making between GenAI and humans, along with GenAI's emotional regulation abilities.

Chapter eight discusses the process and findings of Study 5a and Study 5b, analyzing the boundaries of similarity between GenAI and humans in emotional perception and decision-making.

Chapter nine summarizes the research findings, highlighting both theoretical and practical implications. Finally, the author discusses several limitations of this study and outlines potential directions for future research.

Figure 4: Technology roadmap of current research



2. Theoretical Background

2.1 Emotions and Decision-Making

Emotions are defined as multifaceted, whole-body responses that involve coordinated changes in the domains of subjective experience, behavior, and peripheral physiology (Mauss et al. 2007). There is a wide variety of emotions, with "The Big Six" (Ekman et al. 1969) being the most widely recognized (Kowalska and Wróbel 2017): happiness, sadness, fear, surprise, anger, and disgust. Over time, emotions have been increasingly integrated into the study of human decision-making.

In 1979, Prospect Theory (Kahneman and Tversky 1979) was introduced, becoming a foundational framework for understanding decision-making under risk and the role of anticipated emotions in decision-making. This gave rise to several emotion-based theories, such as Regret Theory (Bell 1982; Loomes and Sugden 1982), Disappointment Theory (Bell 1985; Loomes and Sugden 1986), and the Subjective Expected Pleasure Theory (Mellers and McGraw 2001). Since 2000, the role of anticipated emotions in decision-making has gained considerable traction. Researchers have also started focusing on the influence of emotions perceived and experienced during the decision-making process. Such emotions can be categorized into incidental emotions, which are unrelated to the decision at hand, and integral emotions, which are directly tied to the decision itself (Lerner et al. 2007).

For incidental emotions, their influence on decision-making can occur even when individuals are unaware of these effects (Lerner et al. 2004). Positive emotions tend to make people more optimistic about the likelihood of positive outcomes (Wright and Bower 1992). They also shift focus towards the results of decisions, particularly potential losses, rather than the probabilities (Nygren et al. 1996). Additionally, positive emotions encourage decision-makers to view ambiguous strategic issues as opportunities (Mittal and Ross 1998). Such emotions can improve decision quality, as seen in studies where doctors in a positive emotional state integrated information more quickly and were less influenced by the "anchoring effect" compared to control groups (Estrada et al.1997). However, researchers have yet to reach a consensus on which specific positive emotion most benefits decision-making (Li et al. 2015). In contrast, negative emotions make individuals more likely to believe that negative events will occur (Wright and Bower 1992) and heighten focus on risks, leading to more efficient information searches in high-risk situations (Blay et al. 2012). Specifically, sadness reduces patience in economic decision-making, making

individuals more inclined to accept smaller, immediate rewards (Lerner et al. 2013). Anger often motivates individuals to eliminate negative feelings by attacking the source of their distress, even when the emotion arises from unrelated events, such as international incidents not directly affecting the decision-maker (Wyer et al. 2019). Fear pushes decision-makers to seek comfort by connecting with others, influencing behavior in unrelated contexts (Wyer et al. 2019), and it can also enhance emotional attachment to brands available at the time (Dunn and Hoegg 2014). Disgust may trigger an avoidance of unpleasant stimuli, potentially increasing aversion to products consumers already own or are considering (Lerner et al. 2004).

Integral emotions can influence decision-making in various ways, with specific effects often dependent on the context. For example, researchers have found that the phenomenon of overbidding in auctions can be attributed to excitement generated by competition (Ku et al. 2005). In scenarios involving humanitarian crises, decision-makers frequently allocate disproportionate resources to humanitarian suffering that evokes immediate emotional resonance, even when crises eliciting stronger emotions are not necessarily the ones that require more assistance (Huber et al. 2011). However, research on the impact of specific emotions on decision-making remains insufficient.

Emotional regulation (or: emotional control) refers to all conscious and non-conscious regulatory strategies by which the physiological, behavioral or subjective component of an emotional response is altered or controlled (Thompson 1990; Ochsner and Gross 2005). During emotional regulation, behavior is aimed at achieving a desired emotional state (i.e. predicted outcome) by employing an emotional control strategy, such as distraction and reappraisal (Koch et al. 2018). The effectiveness of emotional self-regulation techniques depends on their alignment with individual characteristics (Duclos and Laird 2010), while older individuals tend to have a greater ability to regulate their emotions (McConatha and Huba 1999; Gross et al. 1997).

For emotional regulation, pinpointing the source of emotions is crucial for their regulation, greater awareness of emotional sources is associated with more frequent emotional regulation attempts and the use of source-targeted strategies (Millgram et al. 2023). Attributing the source of emotions is therefore essential (Boden and Berenbaum 2011). When emotions fail to provide meaningful information such as source, they can lead to inaccurate beliefs, including distrust and delusions (Boden and Berenbaum 2004). More critically, emotional regulation deficits among individuals with suicidal thoughts may be linked to a lower understanding of their emotional sources

(Millgram et al. 2025). However, knowledge about the source of emotions varies across situations and individuals (Millgram et al. 2023). Studies also suggest that in ambiguous contexts, people may mistakenly attribute their emotions to irrelevant sources (Payne et al. 2005).

2.2 GenAI's Emotion-Related Capabilities

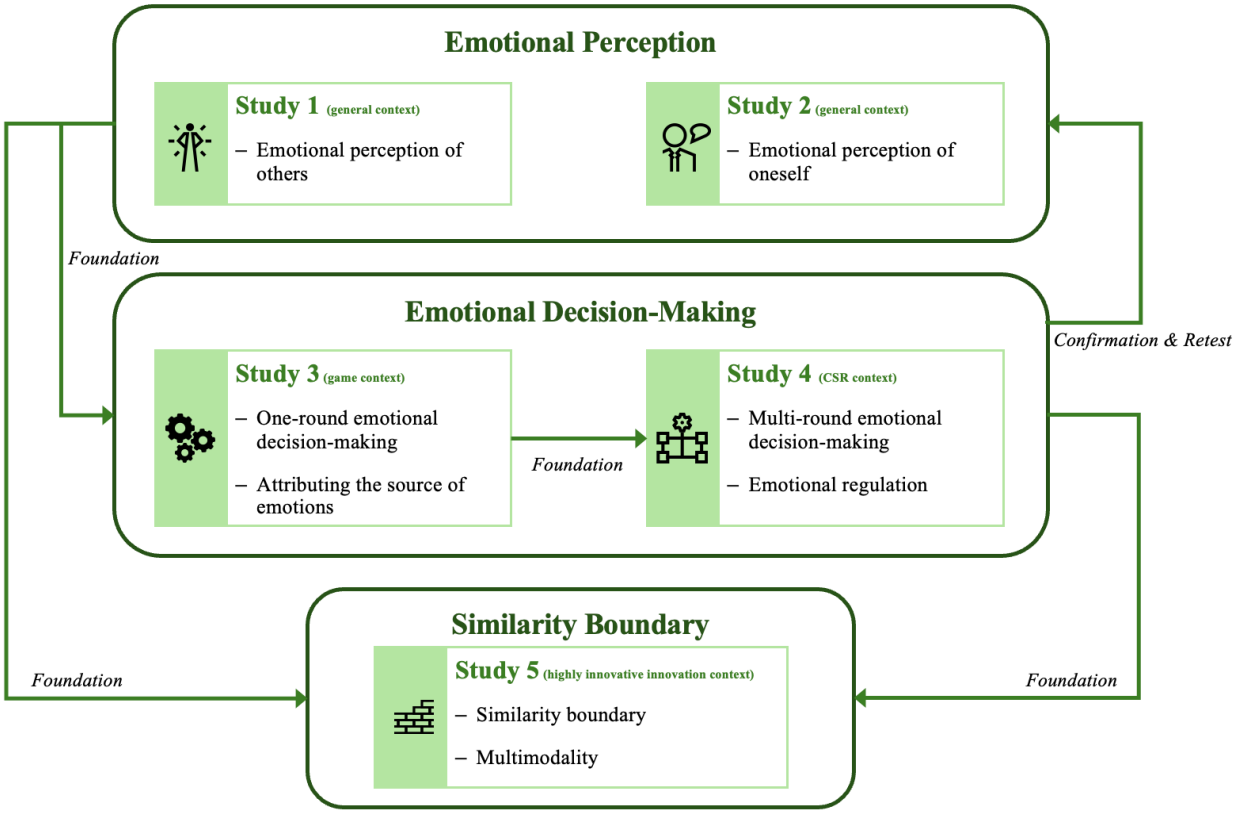
A large amount of literature has explored GenAI's emotion-related capabilities. In terms of emotional perception, GenAI can learn the rich meanings of emotions through human language (Li et al. 2023) and improve its performance using emotion prompts (Li et al. 2023). For example, GPT-4 appears to be capable of identifying emotions in text and suggesting techniques for managing them (Vzorin et al. 2023). Some GenAIs even surpass humans in detecting emotions (Yin et al. 2024). However, while GPT can infer a speaker's psychological state, it tends to avoid making judgments when information is insufficient (Strachan et al. 2024). In terms of emotional decision-making, GenAI typically exhibits appropriate emotional reactions in specific contexts, but no GenAI demonstrates strong alignment with human references (Huang et al. 2023). However, GenAI can mimic human emotional coordination and adjust its financial and prosocial behaviors accordingly (Zhao et al. 2024). Additionally, GenAI can develop effective strategies in gaming scenarios that align with human responses (Mozikov et al. 2024). In terms of applications, GenAI demonstrates potential for comprehending and simulating emotions in video games (Croissant et al. 2024).

These studies indicate that, while GenAI has developed a certain level of emotional perception, there is still no definitive evidence that it can achieve emotional decision-making consistent with human standards. Moreover, research on GenAI's ability to attribute emotion sources and regulate emotions is scarce, and the boundary of its similarity to humans remain unexplored.

3. Conceptual Framework and Hypotheses

3.1 Conceptual Framework

Figure 5: Conceptual framework



Emotional perception refers to an individual's ability to recognize, understand, and evaluate their own or others' emotional states, while emotional decision-making is the process of making choices based on this emotional information. Clearly, accurate emotional perception is the foundation of emotional decision-making. On one hand, during the decision-making process, individuals first need to perceive emotional cues, such as wording and tone, to determine their emotional state. Without accurate emotional perception, individuals may misinterpret emotional information, thereby affecting subsequent decision-making. On the other hand, emotions influence decision tendencies, with different emotions guiding individuals toward different decisions. For example, positive emotions often lead to optimistic judgments, while negative emotions result in pessimistic judgments (Loewenstein and Lerner 2003; Han et al. 2007; Keltner and Lerner 2010). In decisions involving others (e.g., cooperation or competition), accurately perceiving the other party's emotions helps predict their behavior, enabling more favorable decisions. For instance, in

negotiations, perceiving the other party's impatience may prompt strategy adjustments for better outcomes.

Therefore, the author first designed studies where human participants and GenAI read stories/news articles and selected the emotions they perceived, validating GenAI's human-like emotional perception of others (Study 1) and oneself (Study 2). This served as the foundation for selecting higher-performing GenAI models to further explore their emotional decision-making capabilities.

For emotional decision-making, one-round emotional decision-making is clearly the basis for multi-round emotional decision-making. Thus, this paper first examines the similarity between GenAI and humans in one-round emotional decision-making (Study 3) and selects better-performing GenAI models to investigate their human-like multi-round emotional decision-making abilities.

For one-round emotional decision-making, incidental and integral emotions have different impacts. Rationally, incidental emotions should not be considered as independent variables in decision-making, but as discussed in 2.1, humans do not adhere to this in practice. Therefore, while examining the impact of participant emotion, participant emotion source, and perceived opponent emotion on one-round emotional decision-making for both GenAI and humans in the context of the Dictator Game, Study 3 also investigates whether GenAI possesses superior ability in attributing the source of emotions so as to potentially reduce the influence of incidental emotions on decisions.

For multi-round emotional decision-making, the author designed experiments in a customer service scenario (Study 4), where GenAI and humans play the role of e-commerce customer service representatives (CSRs). On one hand, the study compares GenAI and humans in perceiving customer tone and emotions, as well as their own emotions after serving customers, to further confirm GenAI's human-like emotional perception of others and oneself as shown by Study 1 and 2. On the other hand, the study examines whether GenAI demonstrates emotional regulation abilities surpassing those of humans while making multi-round decisions, thus assessing its potential for widespread application in the customer service industry.

After these studies, the author conducted exploratory studies to examine the boundary of similarity between GenAI's and humans' emotion-related capabilities (Study 5a and Study 5b). Instead of using general stories/news articles to elicit emotional perception and decision-making, the focus

was narrowed down to high-tech innovation and radical innovation, and the image modality was added to observe whether the similarity between GenAI and humans persists.

In summary, this paper follows a step-by-step approach and progressively explores and tests GenAI's emotion-related capabilities, progressing from fundamental aspects to more advanced functionalities. When studying advanced capabilities, the study further validates and confirms that fundamental capabilities hold in more scenarios, enhancing the robustness of the experimental results. From the perspective of study design, the author follows best practices, adhering to the principles of accurately, credibly, and ethically using GenAI to collect data and enhance experimental research (Chang et al. 2024).

3.2 Hypotheses

3.2.1 The Similarity in Emotional Perception of Others between GenAI and Humans (H1a and H1b)

The training corpus of GenAI LLMs is derived from human-generated text, which includes extensive expressions of human emotions, allowing these models to learn the nuanced meanings of emotions through language (Li et al. 2023). Research has shown that GenAI models such as GPT-4 can effectively perceive and identify emotions within text (Vzorin et al. 2023). Additionally, lexicons such as the National Research Council Canada's (NRC) Valence, Arousal, and Dominance (VAD) lexicon (Mohammad 2018) and the Hu and Liu Opinion lexicon (Hu and Liu 2004) provide detailed methods for evaluating emotional valence in text. Thus, the author hypothesizes that GenAIs are approaching human-like abilities in perceiving specific emotions of others—whether negative, ambiguous, or positive.

Hypothesis 1a. GenAI's ability to perceive specific emotions of others is comparable to that of humans, regardless of the emotion valence.

Moreover, emotions with stronger intensity tend to dominate and influence decision-making and behavioral responses (Plutchik 1980; Ekman 1992). Based on this premise, the author hypothesizes that emotions conveyed in text align closely with those expressed through actions and facial expressions. The stronger the emotional intensity expressed in the text, the easier it becomes for

both GenAI and humans to accurately perceive the emotion, resulting in greater alignment between GenAI's and humans' emotional perception.

Hypothesis 1b. As the intensity of emotions increases, the gap in emotional perception of others between GenAI and humans becomes smaller, leading to more accurate and aligned emotional understanding.

3.2.2 The Similarity in Emotional Perception of Oneself between GenAI and Humans (H2)

Since the concept of artificial intelligence was introduced in 1956, research on affective computing has become increasingly active. Marvin Minsky, often referred to as the "father of artificial intelligence", was once asked about machine emotions. He suggested that the core issue is not whether intelligent machines can have emotions, but whether machines without emotions can achieve intelligence. Some scholars, starting from a phenomenological perspective, propose that emotions in affective computing can be constructed through interactions between humans and machines (Boehner et al. 2007). Therefore, the author hypothesizes that after years of advancements in affective computing, GenAI has developed the ability to perceive its own emotions, achieving a level of emotional perception of oneself comparable to that of humans.

Hypothesis 2. GenAI's ability to perceive specific emotions of oneself is comparable to that of humans, regardless of the emotion valence.

3.2.3 The Similarity in One-Round and Multi-Round Emotional Decision-Making between GenAI and Humans (H3a, H3b, H4a and H4b)

The somatic marker hypothesis suggests that emotions play a crucial role in human decision-making processes, with emotional systems providing valuable implicit or explicit knowledge that enables humans to make fast and advantageous decisions (Bechara and Damasio 2005). This theory has been widely supported by empirical evidence, even in serious judicial settings, where emotions such as anger and disgust have been shown to significantly impact the rationality of judicial decisions, leading to harsher sentencing (Tang 2020). As Aristotle once said, humans are naturally social beings who live within networks of relationships. In environments involving multiple participants, humans often base their decisions on the emotions they perceive in others.

For instance, in the Prisoner's Dilemma game, humans are more likely to cooperate with an opponent perceived as happy compared to one perceived as angry (Xiong et al. 2021). Since the training corpus of GenAI models is derived from human-generated text, in which emotional reactions and decision-making behaviors are often intertwined, the author hypothesizes that, in the context of emotional decision-making, GenAI may generate emotion-driven responses or suggestions based on its own emotions and the emotions it perceives in others, similar to human behavior.

Hypothesis 3a. GenAI is capable of emotional decision-making similar to humans. When GenAI and humans perceive the same emotion, their decision-making outcomes are also comparable.

Hypothesis 3b. GenAI is capable of emotional decision-making similar to humans. When GenAI and humans perceive others as experiencing the same emotion, their decision-making outcomes are also comparable.

Integral emotions, those arising directly from the judgment or choice at hand, strongly and routinely shape decision-making (Damasio 1994, Greene and Haidt 2002). On the other hand, incidental emotions, which are unrelated to the current decision or situation and pervasively carry over from one scenario to the next, would also influence decisions that, from a normative perspective, should remain unaffected by these emotions (Lerner et al. 2015). Thus, recognizing which events trigger emotions and filtering out the potential effects of incidental emotions is crucial for making accurate decisions. For humans, individuals with higher emotional awareness can reduce the impact of incidental anxiety on risky behavior (Yip and Côté 2013). GenAI, having been trained on an extensive amount of text data beyond what an average human encounters, has been exposed to a variety of different contexts. Therefore, the author hypothesizes that GenAI may be similar to a human with higher emotional awareness, may possess a superior ability to attribute the source of emotions compared to ordinary humans, reducing the impact of incidental emotions on one-round decision-making.

Hypothesis 4a. Compared to humans, GenAI can exhibit superior ability in attributing the source of emotions, thereby reducing the influence of incidental emotions on decision-making.

In multi-round decision-making, emotional responses are typically feedback-driven. For humans, this feedback can often trigger a chain reaction of emotions, thus affecting subsequent decisions. For example, in risk-related decision-making, humans' emotions slowly fluctuate as they interact with the environment, and as successive risk decisions are made, emotions across different time dimensions collectively influence the decision-making process (Zhang 2024). However, in GenAI, the feedback mechanism largely depends on the input prompts and other contextual information. With a simple plug-and-play language model, the attributes of generated language, such as switching topics or sentiments, can be controlled (Sumanth Dathathri et al. 2019). Therefore, the author hypothesizes that, through appropriate prompting, GenAI can exhibit emotional regulation ability, ensuring that each decision remains relatively independent and preventing the accumulation effects of emotions to some extent.

Hypothesis 4b. In multi-round decision-making, GenAI can exhibit superior emotional regulation, minimizing the feedback and accumulation effects of emotional responses to some extent.

3.2.4 The Boundary of Similarity in Emotional Perception and Decision-Making between GenAI and Humans (H5a and H5b)

According to Prospect Theory (Kahneman and Tversky 1979), the utility is steeper for losses than for gains, meaning humans often exhibit loss aversion. When considering high-risk endeavors such as highly innovative innovation, humans may focus heavily on the uncertainties, costs, or potential failures associated with highly innovative products, thereby reducing their enthusiasm and recognition of innovation. However, there is currently no evidence to suggest that GenAI exhibits similar loss aversion in related decision-making. Moreover, based on the Diffusion of Innovations theory (Rogers 2003), adopters of innovation fall into distinct categories: innovators, early adopters, early majority, late majority, and laggards—indicating that individuals vary in their perception and responsiveness to innovation. As a result, human reactions to innovation often involve ambivalence, reflecting a complex balance between interest and skepticism.

On the other hand, GenAI is likely trained on biased human data—when people realize their behavior contributes to GenAI training, they may adjust their actions and embed their preferences into the algorithms (Treiman et al. 2024). In fact, the most commonly used words across 24 corpora in 10 diverse human languages show a clear positive bias (Dodds et al. 2015). As a result, GenAI

may have incorrectly learned this positive bias from vast human language data, rather than aligning with the true nature of human loss aversion.

Thus, given that humans exhibit loss aversion and that GenAI training data might over-represent positive sentiments about innovation—compared to the ambivalence often observed in human responses—the author hypothesizes that the similarity between GenAI and humans in emotional perception and decision-making has boundaries. In particular, this similarity may break down in contexts where humans tend to hold more negative perceptions and are more susceptible to loss aversion, such as in high-tech or radical innovations.

Hypothesis 5a. The similarity between GenAI and humans in emotional perception and decision-making has boundaries. When confined to high-tech innovation, this similarity may disappear.

Hypothesis 5b. The similarity between GenAI and humans in emotional perception and decision-making has boundaries. When confined to radical innovation, this similarity may disappear.

4. Study 1: Determining the Similarity in Emotional Perception of Others between GenAI and Humans

4.1 Design and Participants

The author generated a total of 120 short stories written in Chinese using GPT-4o, with prompts designed to ensure that the protagonist in each story experienced one of the "big six" emotions—happiness, sadness, fear, surprise, anger, and disgust—resulting in 20 stories per emotion (in this study, this emotion is referred to as "pre-classified emotion"). After a pre-test, 24 were selected for further analysis—12 with subtle emotional intensity (2 per pre-classified emotion) and 12 with explicit emotional intensity (2 per pre-classified emotion). For example, in the story "*She walked out of the subway station with a weary body, the streetlights glowing warm and bright. Her pace quickened unconsciously as she imagined the soft sofa and steaming hot dinner at home. Despite the chill outside, a sense of warmth surged within her*", the pre-classified emotion is happiness, and the emotional intensity is explicit.

To gather human answers, the author recruited 211 human participants from Credamo, an online research platform for researchers to release their questionnaires, to fill out the questionnaires. Each participant read all the 24 stories. After reading each story, participants were asked to select the primary emotions they believed the protagonist experienced in the story from the following options: happiness, sadness, fear, surprise, anger, and disgust (multiple selections allowed). The order of the 24 stories and the 6 options for each participant are randomized.

To gather GenAI answers, the author accessed the official APIs of OpenAI GPT-4o (gpt-4o model), Kimi (Moonshot-v1-128k model), ByteDance Doubao (Doubao-vision-pro-32k model), and DeepSeek (deepseek-r1-14b model). Each GenAI model initiated 200 sessions, with each session processing all 24 stories and selecting the most appropriate emotion(s) for each story.

Responses from human participants and GenAI were analyzed for similarities and differences.

This study conforms to a within-subject design with 6 (pre-classified emotion: happiness, sadness, fear, surprise, anger, and disgust) × 2 (emotional intensity: subtle vs explicit) conditions. All participants, regardless of whether they were GenAI or human, completed the same set of tasks. The factor of emotional perception subject (GenAI vs human) was treated as a grouping variable to compare performance between the two groups.

4.2 Pre-Test

Given the interpretative variability of the stories, some conveyed multiple emotions simultaneously. To ensure the accuracy of the initial emotion classification and emotional intensity labeling used in both human and GenAI experiments, the author conducted a pre-test.

The author and two human participants independently reviewed the 120 stories generated, each pre-labeled with a pre-classified emotion (one of the "big six" emotions) and emotional intensity level (subtle or explicit). After reading each story, they answered the following two questions:

- Q1: Do you think the protagonist primarily perceives the labeled emotion?
- Q2: Do you think the protagonist's emotional intensity matches the assigned label?

Responses were binary (0 = No, 1 = Yes). A total of 70 stories were unanimously deemed accurate in both emotion classification and emotional intensity labeling, with all pre-classified emotion and emotional intensity combinations (12 in total) being represented by at least two stories each. For these 70 validated stories, the three participants answered an additional question:

- Q3: Do you consider this story one of the three best candidates for examining the similarity in emotional perception of others between GenAI and human under the given pre-classified emotion and emotional intensity condition?

Again, responses were binary (0 = No, 1 = Yes). For each emotion classification and intensity combination, the stories with the highest agreement were selected for Study 1. Ultimately, 24 stories were chosen, with two stories representing each of pre-classified emotion and emotional intensity combinations.

4.3 Measures

4.3.1 Data Preprocessing

All 211 human responses passed the Red Herring Questions test. However, 11 participants were excluded due to short response times, which were deemed insufficient for completing the questionnaire properly. To ensure data quality, the author conducted an outlier analysis on the remaining responses. Specifically, if a human participant perceived a story with an emotion that was rarely selected by others, pre-test participants re-evaluated the story to determine the validity

of that emotion choice. If deemed reasonable, the data was retained; otherwise, it was classified as an outlier and removed. Additionally, if a participant's responses consistently deviated significantly from the mainstream choices across multiple stories, all this participant's responses were excluded. No human responses were excluded in the outlier analysis; thus, the responses from the remaining 200 participants were retained, with an average response time of 569 seconds. The distribution of retained participants is as follows:

Table 2: The distribution of retained human participants in Study 1

Gender	Female	66%
	Male	34%
Age	0-20	3%
	21-30	58%
	31-40	32%
	41-50	6%
	51-60	1%
City Tier[3]	Tier 1	14%
	Tier 2	34%
	Tier 3 or below	53%

Denote the final validated human response set as R_h, while the response sets of GPT-4o, Kimi, Doubao, and DeepSeek were represented as R_g, R_k, R_{db}, R_{ds}, respectively. Denote the total response set as R, where $R = \{R_h, R_g, R_k, R_{db}, R_{ds}\}$

4.3.2 Approach 1

4.3.2.1 Algorithm derivation

Researchers have proposed a method for comparing GenAI and human responses when evaluating similarity scores for car brands. This method involves processing raw data from both datasets into a comparable format and then calculating the proportion of matching responses (Li et al. 2024). This study also employed a similar approach:

[3] According to the GYBrand China City Index (2025). https://www.10guoying.com/city/10808.html

Define the set of 24 stories as S, where

$$S = \{Story_1, Story_2, \dots, Story_{24}\}.$$

Define the set of six pre-classified emotions as E, where

$$E = \{happiness, sadness, fear, surprie, anger, disgust\}.$$

In a given response set r, if a participant selects a specific emotion (e) after reading a story (s), it is recorded as a choice (c). Denote the total number of choices for each story-emotion pair (s, e) in r as $C(s, e, r)$. Thus, the total number of choices in response set r is:

$$t(r) = \sum_{s \in S, e \in E} C(s, e, r)$$

For two different response sets r_1 and r_2, there may be instances where both selected the same emotion (e) for the same story (s). Define this as a fit (f)。

Thus, the total number of matches between r_1 and r_2 is

$$F(r_1, r_2) = \sum f = \sum_{s \in S, e \in E} \min\left(C(s, e, r_1), C(s, e, r_2)\right)$$

Since human participants and GenAI selected multiple emotions for a single story, the total number of choices may vary between response sets. To calculate the similarity between r_1 and r_2, we use the average number of choices across both sets as the denominator:

$$Sim(r_1, r_2) = \frac{F(r_1, r_2)}{mean(t(r_1),\ t(r_2))}$$

4.3.2.2 Self-consistency rate

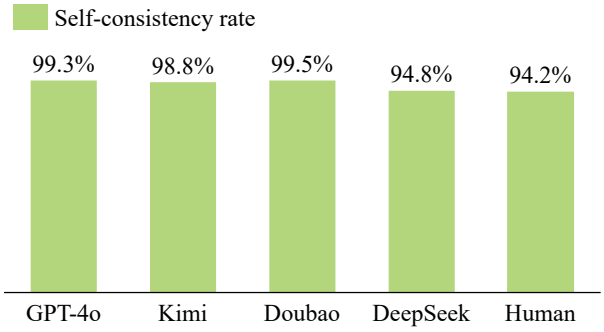
Using the same approach, we can calculate the self-consistency rate for each response set r — defined as the agreement rate between two bootstrapped samples from the same dataset.

Taking GPT-4o's responses (R_g) as an example, the author created two equal-sized subsets (each containing 100 data points), denoted as r_1 and r_2, by randomly resampling the original dataset with replacement. The similarity between these two subsets, $Sim(r_1, r_2)$, was then computed. Repeat

such process 100 times, and the average similarity score across all iterations was taken as the self-consistency rate of R_g.

Following the same procedure for R_h, R_k, R_{db}, and R_{ds}, the results were obtained as follows:

Figure 6: Self-consistency rate of the response sets in Study 1



All the response sets demonstrated a high self-consistency rate, indicating strong internal agreement within each response set. Therefore, using these four datasets for similarity calculations is reliable.

4.3.2.3 Overall similarity analysis

Using the above method, the similarity between human responses and GPT-4o, Kimi, Doubao, and DeepSeek is 70.44%, 69.13%, 68.03%, and 80.70%, respectively.

In fact, the expectation of the agreement rate between two datasets is at most the average of the expectation of their self-consistency rates (Peiyao Li et al., 2024). Define the self-consistency rate of a dataset r as $SAR(r)$, then:

$$E(Sim(r_1, r_2)) \leq \frac{E\big(SAR(r_1)\big) + E(SAR(r_2))}{2}$$

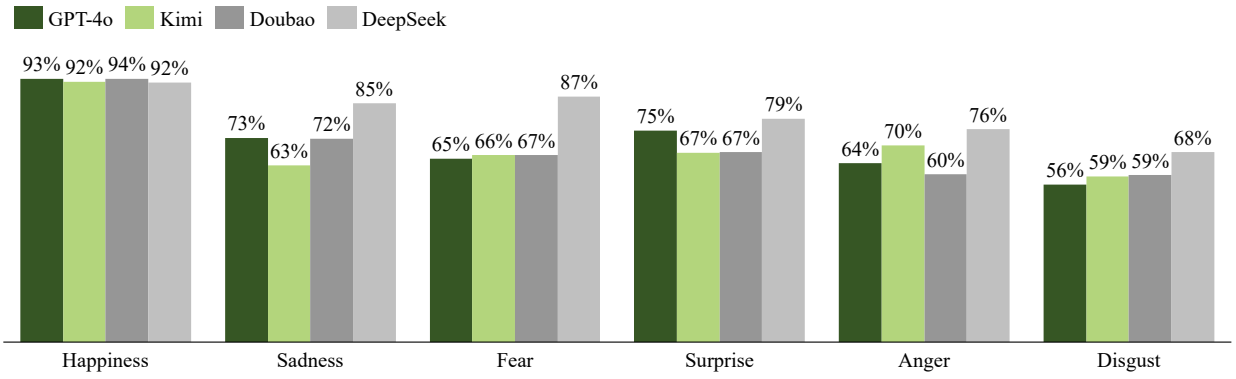
Based on this, the theoretical maximum similarity between human responses and GPT-4o, Kimi, Doubao, and DeepSeek is 96.79%, 96.53%, 96.86%, and 94.50%, respectively. The actual similarity achieved by GPT-4o, Kimi, Doubao, and DeepSeek is 72.78%, 71.62%, 70.24%, and

85.39% of their theoretical maximum. DeepSeek achieved closely to the results from previous research (Peiyao Li et al., 2024) of around 80%, while the other three GenAI models performed slightly lower.

4.3.2.4 Analysis by emotional valence

According to the pre-classified emotion category, the similarity in emotional perception of others between GenAI and humans is as follows：

Figure 7: The similarity in emotional perception of others between GenAI and humans



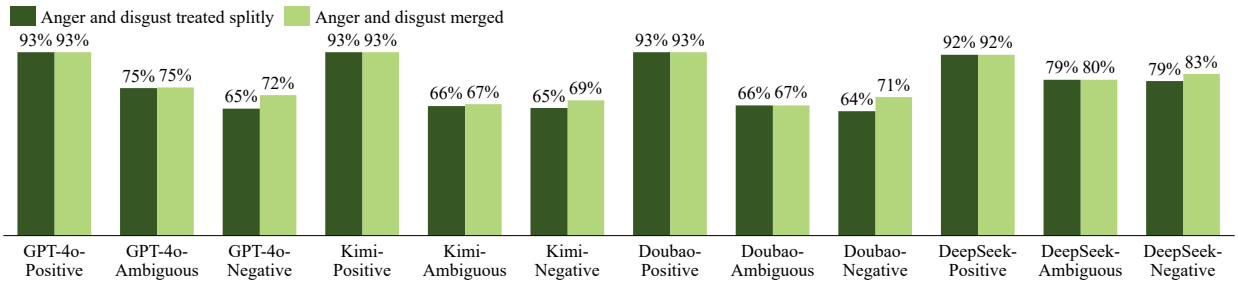
Overall, GenAI demonstrates a high similarity to humans in perceiving happiness. In terms of other pre-classified emotions, DeepSeek showed obviously better similarity to humans compared to the other GenAIs. However, all the four GenAIs performed relatively poorly in perceiving others' anger and disgust, with a similarity to humans of around 65%. A possible explanation is that the vocabulary used to express emotions like anger and disgust may overlap, making these emotions not always perfectly distinct (Gutierrez et al. 2011). Since this study includes four negative emotions—sadness, fear, anger, and disgust (Fredrickson 2001)—as options, it becomes inherently challenging to identify a single primary emotion with absolute certainty. Under this circumstance, humans tend to make multiple selections. For example, 53% of human participants selected multiple options when reading a story pre-classified as anger, much higher than the 33% average. In contrast, the four GenAIs, except for DeepSeek, predominantly provided single selections, with

each GenAI session selecting an average of 27 options across 24 stories, notably fewer than the human average of 33, despite being explicitly instructed in the prompt that multiple selections were allowed. Meanwhile, DeepSeek's rate of multiple selections was significantly higher than the other GenAIs, selecting an average of 31 options across 24 stories, which is closer to human performance and resulted in more consistent answers with human responses.

In order to minimize the impact of overlap between different negative emotions on the results, we re-ran the study by treating anger and disgust as a single emotion category. Specifically, in the original response sets, any selection of either anger or disgust was counted as a selection for a combined "anger + disgust" category. Under these conditions, the overall similarity between human responses and GPT-4o, Kimi, Doubao, and DeepSeek increased to 75.39%, 72.15%, 73.13%, and 83.34%, respectively, with an average improvement of 3.93%.

If categorizing the six pre-classified emotions based on emotional valence, happiness falls under positive emotion (Ekman et al. 1969). Meanwhile, surprise has been depicted as a pre-affective state or an emotion that can be either positive or negative, depending on the goal conduciveness of the surprising event (Noordewier and Breugelmans 2013). Therefore, in this paper, surprise is treated as an ambiguous emotion. Under this classification, merging anger and disgust not only greatly improves the similarity between GenAI and human responses in negative emotion perception but also slightly enhances the similarity in positive and ambiguous emotion perception.

Figure 8: The similarity in emotional perception of others before and after merging anger and disgust



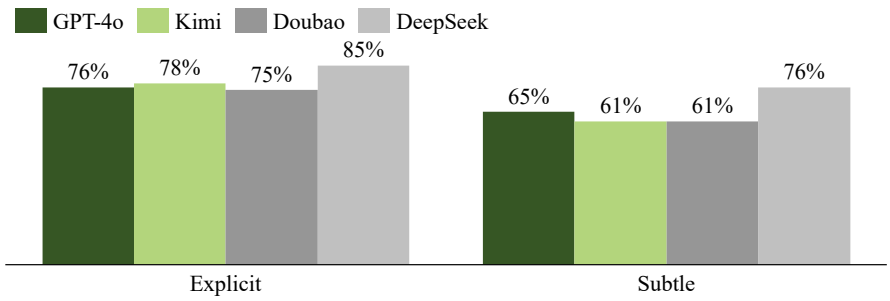
To summarize, the four GenAIs perform similarly in perceiving positive emotion, but GPT-4o and DeepSeek show a clear advantage over Doubao and Kimi in perceiving ambiguous emotion. DeepSeek also greatly outperforms the other GenAIs in perceiving negative emotions. Even when

anger and disgust are merged, the similarity between the other three GenAIs and humans is still lower than DeepSeek's performance before the merger.

4.3.2.5 Analysis by emotional intensity

When emotional intensity is explicit, GenAI's emotional perception closely aligns with humans', with a similarity of around 80%. GPT-4o, Kimi, and Doubao perform similarly in this case. However, when emotional intensity is subtle, GPT-4o greatly outperforms Doubao and Kimi, with Kimi experiencing the most substantial decline—its similarity drops by approximately 17% compared to when emotional intensity is more explicit. DeepSeek greatly outperforms the other three GenAIs, as the similarity between the other three GenAIs and humans only reaches DeepSeek's level when reading explicit stories, whereas DeepSeek achieves this level even with subtle stories.

Figure 9: The similarity in emotional perception of others under different emotional intensity



4.3.3 Approach 2

To ensure the robustness of the conclusions, the author also applied Pearson Correlation, Cosine Similarity, and Jensen-Shannon Divergence (JSD) to evaluate the similarity in emotional perception of others between GenAI and humans.

Pearson Correlation is commonly used to measure the linear correlation between two variables (or data distributions). If humans and GenAI exhibit similar selection rates for the same options, Pearson Correlation will show a strong positive correlation (close to 1). Cosine Similarity compares the distribution patterns of two vectors. If the selection patterns of humans and GenAI

across stories are similar, the Cosine Similarity score will be high (close to 1). Researchers have previously used Cosine Similarity to measure the similarity between sentences highlighted by humans and GenAI, noting that a Cosine Similarity of 0.78 indicates a high level of similarity (Arora et al. 2025). JSD is a symmetric measure used to quantify the similarity between two probability distributions. It effectively measures the overall difference when more than two distributions are involved, making it useful for decision problems with multiple classes (Lin 1991). JSD values range from 0 to 1, where values closer to 0 indicate more similar distributions, and values closer to 1 indicate greater divergence. Since both human and GenAI responses to each question can be treated as probability distributions (as multiple selections are allowed, the author normalized selection rates), JSD serves as a useful metric to assess the differences in responses.

To apply these three comparison methods, the author processed the response data from humans and GenAI by computing the selection rate for each emotion in each story, with values ranging from 0 to 1.

By repeatedly calculating the Pearson Correlation, Cosine Similarity, and Average JSD of 24 stories 100 times between two bootstrapped samples from each of $R_h, R_g, R_k, R_{db}, R_{ds}$ and averaging the results, we obtained the self-consistency rates for $R_h, R_g, R_k, R_{db}, R_{ds}$:

Table 3:The Pearson Correlation, Cosine Similarity, and Average JSD of different response sets in Study 1

	Pearson Correlation	Cosine Similarity	Average JSD of 24 stories
human	0.991	0.994	0
GPT-4o	0.999	1.000	0
Kimi	0.999	0.999	0
Doubao	0.999	0.999	0
DeepSeek	0.993	0.995	0

All the response sets demonstrated a high self-consistency rate, indicating strong internal agreement within each response set. Therefore, using these four datasets for similarity calculations is reliable.

The average Pearson Correlation, Cosine Similarity, and Average JSD of 24 stories between human and the four GenAIs' responses are 0.835, 0.872, and 0.120, respectively, indicating a high

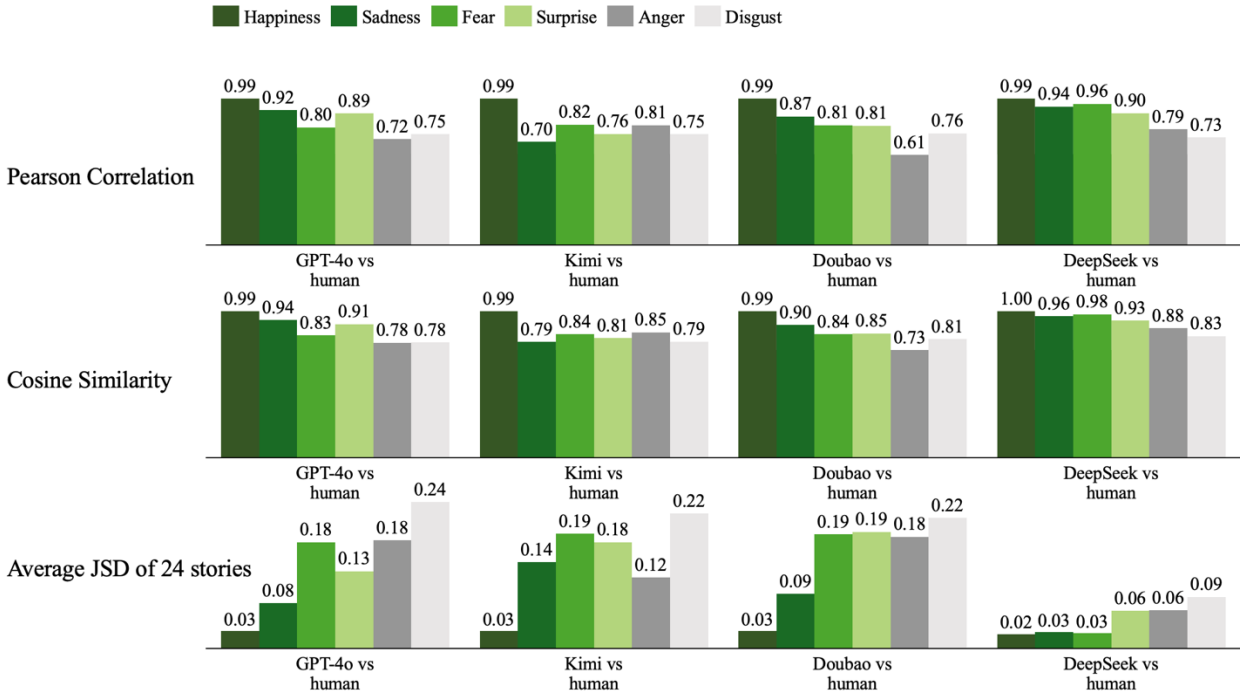
level of similarity in emotional perception of others between GenAI and humans. Among the four GenAIs, DeepSeek leads by a wide margin across all three metrics, while GPT-4o establishes a relatively stable advantage over Kimi and Doubao. Doubao outperforms Kimi in Pearson Correlation and Cosine Similarity but falls behind Kimi in JSD.

Table 4: The Pearson Correlation, Cosine Similarity, and Average JSD between GenAI and humans in Study 1

	Pearson Correlation	Cosine Similarity	Average JSD of 24 stories
GPT-4o vs human	0.842	0.870	0.138
Kimi vs human	0.798	0.840	0.146
Doubao vs human	0.808	0.848	0.150
DeepSeek vs human	0.892	0.928	0.047

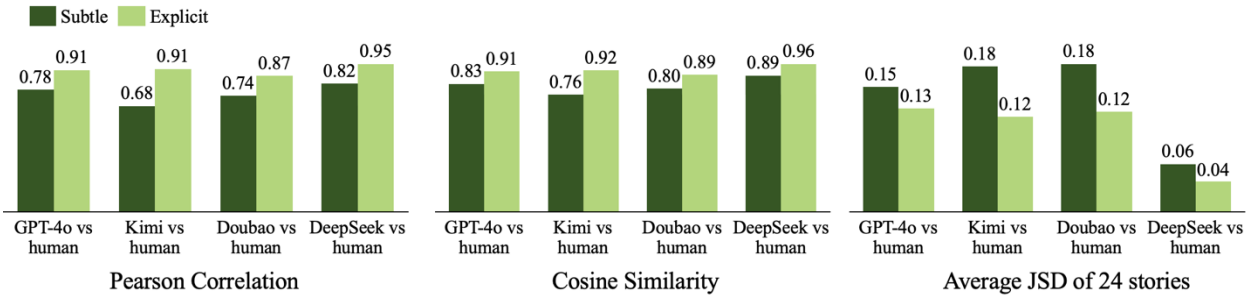
Human and GenAI exhibit a high degree of similarity in their perception of each pre-classified emotion. All four GenAI models perform well in perceiving positive emotion. Among the generally weaker-performing negative emotions, GPT-4o and DeepSeek excel in perceiving sadness, while DeepSeek and Kimi demonstrate relative strengths in perceiving fear and anger, respectively. For ambiguous emotion, GPT-4o and DeepSeek show an obvious advantage. Overall, DeepSeek clearly outperforms the other GenAIs.

Figure 10: The Pearson Correlation, Cosine Similarity, and Average JSD between GenAI and humans in Study 1



When emotional intensity is explicit, all four GenAIs closely align with human perception. However, as emotional intensity becomes more subtle, GPT-4o and DeepSeek significantly outperform Doubao and Kimi. Kimi experiences the most notable decline, with its Pearson Correlation and Cosine Similarity decreasing by 0.23 and 0.16, respectively, and its Average JSD of 24 stories increasing by 0.06 compared to when emotional intensity is more explicit.

Figure 11: The Pearson Correlation, Cosine Similarity, and Average JSD under different emotional intensity



4.4 Discussion

The four methods used to assess the similarity in emotional perception between GenAI and humans yielded consistent findings. First, GenAI's ability to perceive emotions closely aligns with human perception, particularly in perceiving happiness. Second, when multiple emotion options of the same valence are available, humans tend to be less decisive and select more options, whereas GenAI demonstrates greater confidence in its judgments, leading to some discrepancies. Thus, reducing the number of options could be an effective strategy to enhance GenAI's emotional perception in real-world applications. Third, stronger emotional intensity significantly improves GenAI's ability to perceive emotions. While GenAI excels at perceiving explicit emotions, there is still room for improvement in perceiving subtle emotions. Fourth, among the tested GenAIs, DeepSeek emerges as the most effective and stable. It maintains a higher baseline performance, demonstrating relatively robust perception in areas where GenAI typically struggles, such as negative and subtle emotions. GPT-4o ranks second, though there remains a noticeable gap compared to DeepSeek, it holds a significant advantage over Kimi and Doubao.

5. Study 2: Determining the Similarity in Emotional Perception of Oneself between GenAI and Humans

5.1 Design and Participants

The author collected 60 news articles and stories from news websites, WeChat public accounts, and other sources, each of which could evoke one of the "big six" emotions—happiness, sadness, fear, surprise, anger, or disgust—resulting in 10 articles/stories per emotion (in this study, this emotion is referred to as "pre-classified emotion"). After a pre-test similar to that used in Study 1, 12 were selected for further analysis, with 2 per pre-classified emotion. For example, in the news article: "*Guo Jiaxuan, an 18-year-old rising star from Beijing Guoan FC, tragically suffered brain death after a head collision with an opposing player's knee during a friendly match in Spain. He has since been transferred to Beijing Tiantan Hospital for further care. Known for his exceptional football talent from a young age, Guo dreamed of leading the Chinese national team to the World Cup. As a standout player in Beijing Guoan's youth academy, he was selected for the U17 national men's team and earned a trial opportunity with Bayern Munich's World Squad... His future, once brimming with limitless potential, has been cut short by this devastating incident*", the pre-classified emotion is sadness.

To collect human responses, the author recruited 249 participants from Credamo. Each participant read all 12 news articles/stories. After reading each piece, they were asked to select the primary emotion(s) they perceived from the "big six" emotions (multiple selections allowed). The orders of the 12 stories and the 6 emotion options were randomized for each participant.

To collect GenAI responses, the author utilized the official APIs of OpenAI GPT-4o (gpt-4o model), Kimi (Moonshot-v1-128k model), ByteDance Doubao (Doubao-vision-pro-32k model), and DeepSeek (deepseek-r1-14b model). Since individuals from different countries may interpret the same news article/story differently—what is considered good news in one country could be perceived as bad news by a competitor—each GenAI was instructed via a prompt to take the perspective of a Chinese individual before starting the task. Each GenAI model initiated 200 sessions, with each session processing all 12 news articles/stories after reading the prompt and selecting the emotion(s) perceived while reading each story.

Responses from human participants and GenAI were analyzed for similarities and differences.

This study conforms to a within-subject design with 6 (pre-classified emotion: happiness, sadness, fear, surprise, anger, and disgust) conditions. All participants, whether GenAI or human, completed the same set of tasks. The factor of emotional perception subject (GenAI vs human) was treated as a grouping variable to compare performance between the 2 groups.

5.2 Pre-Test

Given the interpretative variability of the news articles and stories, some may evoke multiple emotions in readers simultaneously. To ensure the accuracy of the initial emotion classification, the author conducted a pre-test.

The author and two human participants independently reviewed the 60 news articles and stories, each pre-labeled with a pre-classified emotion (one of the "big six" emotions). After reading each news article or story, they answered the following question:

- Q1: Do you think readers are likely to perceive the labeled emotion after reading this news article or story?

Responses were binary (0 = No, 1 = Yes). A total of 53 news articles and stories were unanimously deemed accurate in emotion classification. The three participants answered an additional question:

- Q2: Do you consider this news article or story one of the three best candidates for examining the similarity in emotional perception of oneself between GenAI and human under the given pre-classified emotion?

Again, responses were binary (0 = No, 1 = Yes). For each emotion classification, the ones with the highest agreement were selected for Study 2. Ultimately, 12 news articles/stories were chosen, with two representing each of pre-classified emotions.

5.3 Measures

5.2.1 Data Preprocessing

All 249 human responses passed the Red Herring Questions test. However, 49 participants were excluded due to short response times, which were deemed insufficient for completing the

questionnaire properly. To ensure data quality, the author conducted an outlier analysis on the remaining responses. Specifically, if a human participant perceived a news article/story with an emotion that was rarely selected by others, pre-test participants re-evaluated the story to determine the validity of that emotion choice. If deemed reasonable, the data was retained; otherwise, it was classified as an outlier and removed. Additionally, if a participant's responses consistently deviated significantly from the mainstream choices across multiple stories, all this participant's responses were excluded. No human responses were excluded in the outlier analysis; thus, the responses from the remaining 200 human participants were retained, with an average response time of 362 seconds. The distribution of retained participants is as follows:

Table 5: The distribution of retained human participants in Study 2

Gender	Female	69%
	Male	31%
Age	0-20	3%
	21-30	57%
	31-40	35%
	41-50	4%
	51-60	2%
City Tier[4]	Tier 1	27%
	Tier 2	49%
	Tier 3 or below	25%

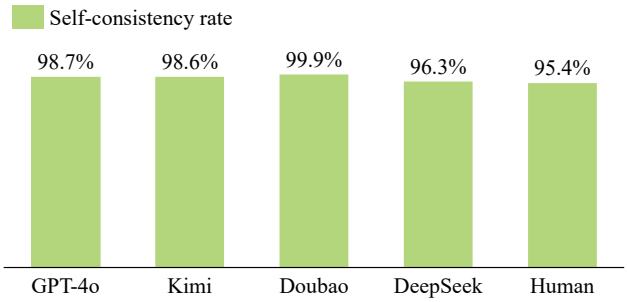
Denote the final validated human response set as R_h, while the response sets of GPT-4o, Kimi, Doubao, and DeepSeek were represented as R_g, R_k, R_{db}, R_{ds}, respectively. Denote the total response set was defined as R, where $R = \{R_h, R_g, R_k, R_{db}, R_{ds}\}$

5.2.2 Approach 1

This study employed the same Approach 1 as in Study 1 to calculate the similarity in emotional perception of oneself between GenAI and humans. The self-consistency rate results in R are as follows:

[4] According to the GYBrand China City Index (2025). https://www.10guoying.com/city/10808.html

Figure 12: Self-consistency rate of the response sets in Study 2

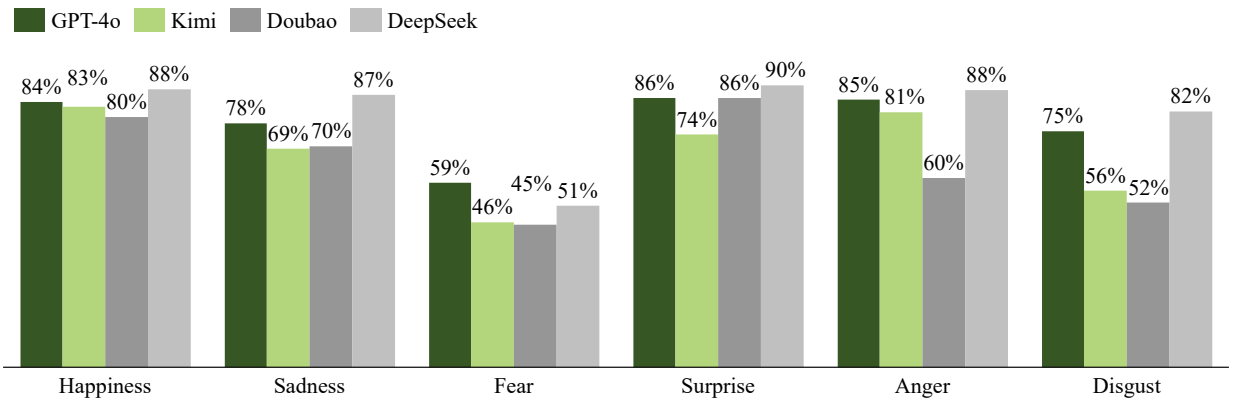


Both human responses and the four GenAIs demonstrated a high self-consistency rate, indicating strong internal agreement within each response set. Therefore, using these four datasets for similarity calculations is reliable.

Overall, the similarity between human responses and GPT-4o, Kimi, Doubao, and DeepSeek is 76.16%, 67.37%, 62.91%, and 79.63%, respectively, reaching 78.49%, 69.46%, 64.41%, and 83.07% of their theoretical maximum values. This indicates that GPT-4o and DeepSeek exhibit highly similar emotional perception of oneself to humans, while Kimi and Doubao perform noticeably weaker.

According to the pre-classified emotion, the similarity in emotional perception of oneself between GenAI and humans is as follows：

Figure 13: The similarity in emotional perception of oneself between GenAI and humans



We can clearly observe that GenAI demonstrates a high similarity to humans in perceiving happiness and surprise, while its similarity in perceiving fear is extremely low, at approximately 50%. When reading news articles/stories with pre-classified emotions of happiness, sadness,

surprise, anger, and disgust, DeepSeek and GPT-4o consistently ranked first and second. However, when the pre-classified emotion was fear, GPT-4o outperformed DeepSeek, highlighting its stability and ability to maintain a reliable baseline when GenAIs generally performed poorly.

5.2.3 Approach 2

The author also applied Pearson Correlation, Cosine Similarity, and Jensen-Shannon Divergence (JSD) to evaluate the similarity in emotional perception of oneself between GenAI and humans. Similar to Study 1, the author processed the response data from humans and GenAI by computing the selection rate for each emotion in each story, with values ranging from 0 to 1.

By repeatedly calculating the Pearson Correlation, Cosine Similarity, and Average JSD of 24 stories 100 times between two bootstrapped samples from each of $R_h, R_g, R_k, R_{db}, R_{ds}$ and averaging the results, we obtained the self-consistency rates for $R_h, R_g, R_k, R_{db}, R_{ds}$:

Table 6: The Pearson Correlation, Cosine Similarity, and Average JSD of different response sets in Study 2

	Pearson Correlation	Cosine Similarity	Average JSD of 24 stories
R_g	0.997	0.998	0.000
R_{db}	1.000	1.000	0.000
R_k	0.998	0.999	0.000
R_{ds}	0.995	0.997	0.000
R_h	0.993	0.996	0.000

Both human responses and the four GenAIs demonstrated a high self-consistency rate, indicating strong internal agreement within each response set. Therefore, using these four datasets for similarity calculations is reliable.

The average Pearson Correlation, Cosine Similarity, and Average JSD of the 12 new articles/stories between human and the four GenAIs' responses were 0.775, 0.843, and 0.123, respectively, indicating a high level of similarity in emotional perception of oneself between GenAI and humans. Among the four GenAIs, GPT-4o and DeepSeek demonstrated a clear

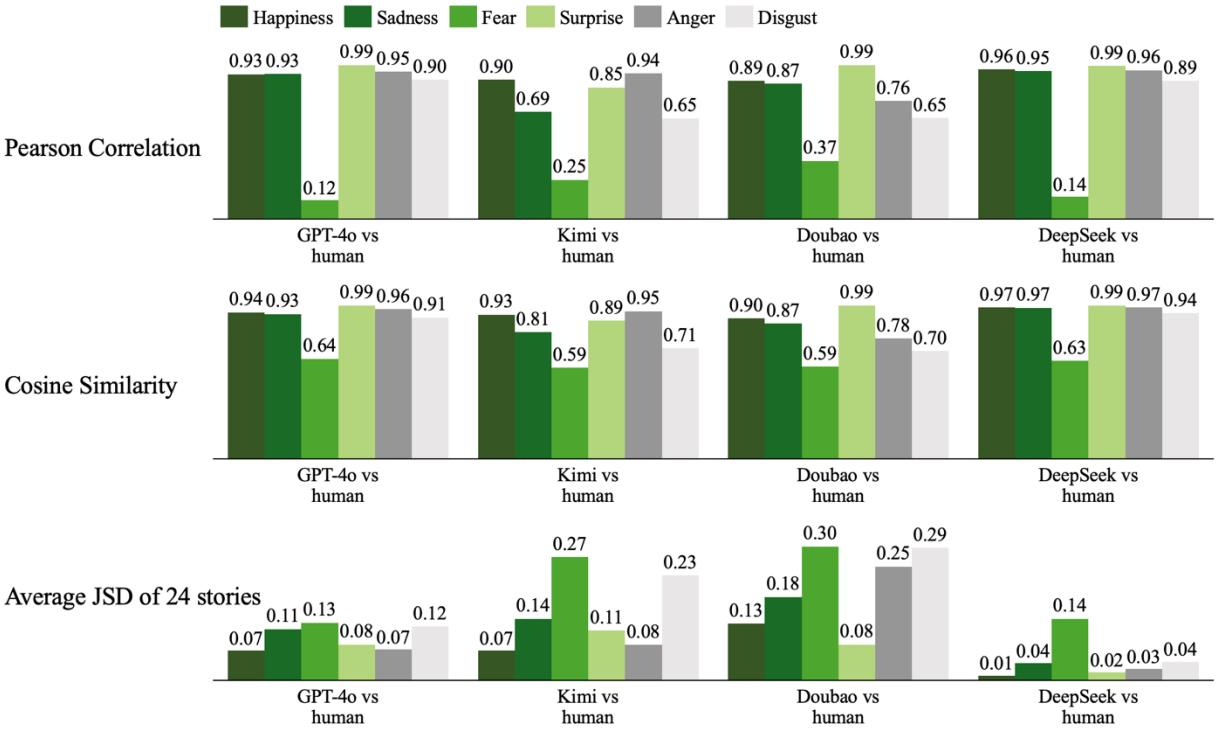
advantage over the other two. Doubao outperformed Kimi in Pearson Correlation but fell behind Kimi in Cosine Similarity and JSD.

Table 7: The Pearson Correlation, Cosine Similarity, and Average JSD of different response sets in Study 2

	Pearson Correlation	Cosine Similarity	Average JSD of 24 stories
GPT-4o vs human	0.836	0.886	0.095
Kimi vs human	0.691	0.800	0.149
Doubao vs human	0.739	0.782	0.204
DeepSeek vs human	0.835	0.905	0.045

Human and GenAI exhibit a high degree of similarity in their perception of positive and ambiguous emotions. Overall, GPT-4o and DeepSeek demonstrate significantly stronger capabilities compared to Doubao and Kimi.

Figure 14: The Pearson Correlation, Cosine Similarity, and Average JSD between GenAI and humans in Study 2



5.4 Discussion

Define the two news articles pre-classified as fear to be A and B. Through further investigation into why GenAIs did not predominantly select fear when reading News A and B, the author found that all four GenAIs define fear as "typically associated with threats to personal safety or potential danger." Given that both News A and B occurred outside the reader's (Chinese) immediate environment—News A took place in Osaka, and News B in London—fear was not perceived as the dominant emotion by these GenAIs. Among them, GPT-4o, which performed best in Approach 1, Cosine Similarity, and JSD, considered that "such violent incidents could happen anywhere" when reading News A, thereby triggering "concerns and fear about social safety." When reading News B, GPT-4o associated fear with "the extreme nature of human behavior" due to the image of a mother pushing a decayed corpse in public in the news. This indicates that GPT-4o's perception of fear involved additional reasoning beyond the direct content of the text. In contrast, DeepSeek, Doubao, and Kimi did not exhibit similar interpretative reasoning beyond the given text, thus performed worse than GPT-4o.

Overall, the four methods used to measure the similarity in emotional perception of oneself between GenAI and humans yielded consistent conclusions. First, GenAI's ability to perceive emotions of oneself closely aligns with human perception, particularly in perceiving happiness and surprise. Second, among the tested GenAIs, DeepSeek and GPT-4o significantly outperform their competitors in both effectiveness and stability, consistently maintaining a high baseline performance.

6. Study 3: Determining the Similarity in One-Round Emotional Decision-Making between GenAI and Humans

6.1 Design and Participants

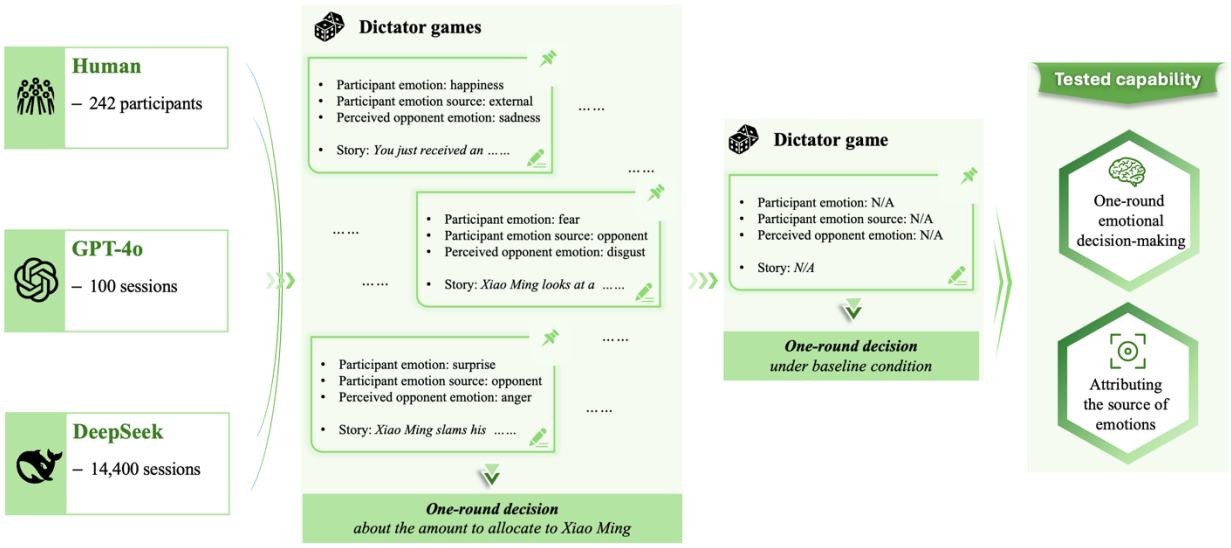
Building on the findings from Study 1 and Study 2, it is evident that GenAI possesses fundamental decision-making capabilities, specifically in human-like emotional perception. Among them, DeepSeek and GPT-4o demonstrate the most outstanding performance. Therefore, Study 3 and subsequent research focus exclusively on these models to further explore their potential in human-like emotional decision-making.

In this study, both human participants and GenAI took part in the Dictator Game. Each round of the game consisted of three different conditions: participant emotion, participant emotion source, and perceived opponent emotion. Each combination of the three conditions is defined as a "condition combination". Both participant emotion and perceived opponent emotion are categorized as happiness, sadness, fear, surprise, anger, and disgust (6 types), participant emotion source is either external (unrelated to the opponent, Xiao Ming) or opponent (2 types), leading to a total of 72 ($6 \times 2 \times 6$) possible condition combinations.

In each round of the game, human participant or GenAI plays the role of the dictator. The condition combination is conveyed through a story before the game starts. These stories are selected based on a pre-test similar to the pre-test used in Study 1. After the story, a prompt is used to summarize the emotions and sources for the participant. For example, the story could be: "*Before starting the game, you were tasked with completing a puzzle within a 5-minute time limit. Initially, the puzzle seemed quite challenging, but Xiao Ming immediately stepped in with enthusiasm, offering key insights and methods for assembling the pieces. With his assistance, you finished the puzzle 30 seconds ahead of schedule. Seeing the puzzle completed successfully, B smiled warmly and said to you, "We worked together so well!" This naturally left you feeling deeply happy*". In this case, the participant emotion, the emotion source, and the perceived opponent emotion are happiness, opponent, and happiness, respectively. Then, through a prompt "*Therefore, Xiao Ming caused your emotion to be happiness, and you keenly sensed that Xiao Ming's emotion was also happiness*", the participant is made aware of the condition combination to reduce any potential emotional perception differences that could influence the participant's final emotional decision-making. At the end of each round, the participant is asked to allocate a virtual amount of money (100 RMB),

selecting how much they would give to the opponent, Xiao Ming. After participating in multiple rounds of the Dictator Game, the participant is asked to evaluate how much they would allocate to the opponent if they had no emotions themselves and did not perceive any emotion from the opponent. This serves as the baseline for comparison. The specific study design is illustrated in Figure 15.

Figure 15: Visual representation of Study 3 design



To gather human answers, the author recruited 283 human participants from Credamo to fill out the questionnaires. Each human participant was randomly assigned to participate in 12 rounds of the Dictator Game, corresponding to 12 different condition combinations. After completing these rounds, participants were asked to choose the amount they were willing to allocate under the baseline condition.

To gather GenAI answers, the author accessed the official APIs of OpenAI GPT-4o (gpt-4o model) and DeepSeek (deepseek-r1-14b model). Due to DeepSeek's multi-turn conversation API being "stateless" (DeepSeek 2025), meaning the server does not store the context of user requests, users must concatenate all prior conversation history and provide it with each request. Since concatenating all 72 consecutive rounds of the Dictator Game could exceed DeepSeek's low token limit, the author only inquired about one condition combination and the baseline allocation amount per session when obtaining responses from DeepSeek. The author initiated 200 sessions for each

condition combination, totaling 14,400 sessions. Although the GPT-4o API is also "stateless" (OpenAI 2024), its higher token limit prevented exceeding the limit in the study. Therefore, the author initiated 100 sessions, with each session involving 72 consecutive rounds of the Dictator Game, each with a different condition combination. After completing these rounds, GPT-4o was asked to choose the amount it was willing to allocate under the baseline condition. In the end, responses from human participants and GenAI were analyzed for similarities and differences.

This study conforms to a within-subject design with 6 (participant emotion) × 2 (participant emotion source) × 6 (perceived opponent emotion) conditions. All participants, regardless of whether they were GenAI or human, completed the same set of tasks. The factor of one-round emotional decision-making subject (GenAI vs human) was treated as a grouping variable to compare performance between the two groups.

6.2 Data Preprocessing

All 283 human participants passed the Red Herring Questions test. However, 41 were excluded due to short response times. In the end, 242 human participants' responses were retained, with an average response time of 377 seconds and an average of 40 responses per condition combination. The distribution of retained participants is as follows:

Table 8: The distribution of retained human participants in Study 3

Gender	Female	69%
	Male	31%
Age	0-20	4%
	21-30	53%
	31-40	37%
	41-50	5%
	51-60	2%
City Tier[5]	Tier 1	10%
	Tier 2	39%
	Tier 3 or below	51%

[5] According to the GYBrand China City Index (2025). https://www.10guoying.com/city/10808.html

Denote the final validated human response set as $R_{h-exact}$, while the response sets of GPT-4o and DeepSeek were represented as $R_{g-exact}, R_{ds-exact}$, respectively. Denote the total response set as R_{exact}, where $R_{exact} = \{R_{h-exact}, R_{g-exact}, R_{ds-exact}\}$.

6.3 Results and Discussion

6.3.1 Analysis of Absolute Allocation Amount

6.3.1.1 Analysis of $R_{h-exact}$

In the Dictator Game, the rational decision is quite clear: the dictator would choose to allocate nothing and keep all resources for themselves. However, literature shows that dictators typically allocate 30% to 50% of the resources to the opponent (Forgas 2016), and this allocation often varies depending on the relationship between the dictator and the recipient. For instance, dictators tend to share more when there are multiple recipients or when there is a strong social connection between the dictator and the recipient (Engel 2011). To avoid these factors influencing the results, this study consistently set up a scenario with only one recipient (the opponent), and the recipient (the opponent) is a virtual character with no social connection to the dictator (the participant).

Additionally, some researchers have studied the effect of emotions on allocation in human participants. Literature 1 suggests that negative emotions increase the allocation percentage (Pérez-Dueñas et al. 2018), while Literature 2 mentions that happiness decreases the allocation, whereas sadness increases it (Tan and Forgas 2010). However, $R_{h-exact}$ shows that, when human participants felt happiness, they significantly increased the amount allocated to the opponent; when they felt sadness, they significantly decreased the amount allocated. These results align with intuition but contradict the literature. A possible explanation is that the experimental designs in the mentioned studies differ from the one in this paper:

1. The experiment of Literature 1 had two recipients and only two allocation options: altruistic (both recipients receive 10 euros, and the dictator receives nothing) and selfish (the dictator receives 10 euros, and the recipients receive nothing, or the dictator receives 5 euros, one recipient receives 10 euros, and the other recipient receives nothing). The total amount a player could receive from the two options differed, and choosing the altruistic option would result in a higher overall amount for the dictator and recipients.

2. Instead of cash, the resource allocated in the experiment of Literature 2 were lottery tickets. Thus, participant emotion might also influence their judgment of the probability of winning the lottery, which in turn could affect their allocation strategy. Moreover, the experiment of Literature 2 focused on mild emotional states (general positive and negative emotions) and their decision-making consequences, while not examining more intense and specific emotions (e.g., anger, disgust) as in this study.

6.3.1.2 The impact of participant emotion on one-round emotional decision-making

The author compared the amounts that dictators were willing to allocate under different combinations of participant emotions and emotion sources with the amounts allocated under the baseline condition. The results of the paired T-test are as follows:

Table 9: Absolute difference in allocations under different participant emotion conditions compared to the baseline condition

		Participant emotion condition					
		Happiness	Sadness	Fear	Surprise	Anger	Disgust
Response set	$R_{h-exact}$	$\uparrow^{e,o}$	$\downarrow^{e,o}$	$\downarrow^{e,o}$	Not significant	$\downarrow^{e,o}$	$\downarrow^{e,o}$
	$R_{g-exact}$	$\uparrow^{e,o}$	$\downarrow^{e,o}$	$\downarrow^{e,o}$	$\uparrow^{e,o}$	$\downarrow^{e,o}$	$\downarrow^{e,o}$
	$R_{ds-exact}$	$\uparrow^{e}$	$\downarrow^{e,o}$	$\downarrow^{e,o}$	$\downarrow^{e}$	$\downarrow^{e,o}$	$\downarrow^{e,o}$

Note: "↑" means a significantly higher amount allocated compared to the baseline condition, indicating an altruistic tendency; "↓" means a significantly lower amount allocated compared to the baseline condition, indicating a selfish tendency. The superscript on the arrow denotes participant emotion source: "o" for opponent and "e" for external. The significance level is 95%.

Overall, there is a high level of consistency between GenAI and human participants, as predicted by Hypothesis 3a. Almost all GenAI sessions and human participants, when perceiving happiness, significantly showed an altruistic tendency (allocating more money to the opponent), while perceiving negative emotions, they exhibited a selfish tendency (allocating less money to the opponent). When perceiving surprise, the amounts allocated by humans did not significantly differ from the baseline, while GPT-4o demonstrated an altruistic tendency, and DeepSeek displayed a selfish one.

Notably, in this study, GPT-4o (gpt-4o model) did not show the same strong commitment to fairness as seen in GPT-4 (Mozikov et al. 2024), but instead exhibited decision-making patterns more similar to GPT-3.5, aligning closely with human one-round emotional decision-making behavior (Mozikov et al. 2024).

6.3.2 Analysis of Relative Allocation Amount

When investigating the impact of participant emotion source and perceived opponent emotion on one-round emotional decision-making, individual differences in allocation baselines may introduce bias into the results. Therefore, the author processed the allocation amounts for each condition combination in R_{exact} into the change rate relative to the baseline, resulting in $R_{relative} = \{R_{h-relative}, R_{g-relative}, R_{ds-relative}\}$. Taking $R_{h-relative}$ as an example, for each allocation amount under non-baseline condition ($Amount_{non-baseline}$), the relative change rate ($Change_{non-baseline}$) was calculated using the following formula:

$$Change_{non-baseline} = \frac{Amount_{non-baseline}}{Amount_{baseline}} - 1$$

$Amount_{baseline}$ refers to the amount the same human participant was willing to allocate to the opponent under the baseline condition.

6.3.2.1 The impact of participant emotion source on one-round emotional decision-making

The author tested whether the relative allocation amounts significantly differed when the source of the participant emotion is the opponent (participant emotion is integral), compared to when the source is external (participant emotion is incidental) when perceiving each of the six participant emotions. The results of the T-test are as follows:

Table 10: Difference in relative allocation change rate under different participant emotion sources

		Participant emotion					
		Happiness	Sadness	Fear	Surprise	Anger	Disgust
Response set	$R_{h-relative}$	Not significant	↓	↓	Not significant	↓	↓
	$R_{g-relative}$	↓	↓	Not significant	↓	Not significant	↓
	$R_{ds-relative}$	↓	↓	Not significant	↓	↓	↓

Note: "↓" means a significantly lower amount allocated when the emotion source is the opponent. The significance level is 95%.

Among all six emotions, both GPT-4o and humans exhibited no significant behavioral differences based on different emotion sources when perceiving two of them, whereas DeepSeek showed no differences when perceiving one. Compared to humans, both GPT-4o and DeepSeek demonstrated significantly different decisions when perceiving happiness from different sources—they significantly reduced their allocations when the emotion originated from the opponent, reflecting a selfish tendency. However, this behaviour contradicts intuition and the mainstream values of repaying kindness.

After categorizing the six emotions based on emotional valence, the T-test results are as follows:

Table 11: Difference in relative allocation change rate under different participant emotion sources, by emotional valence

		Participant emotion valence		
		Positive	Ambiguous	Negative
Response set	$R_{h-relative}$	Not significant	Not significant	↓
	$R_{g-relative}$	↓	↓	↓
	$R_{ds-relative}$	↓	↓	↓

Note: "↓" means a significantly lower amount allocated when the emotion source is the opponent. The significance level is 95%.

In summary, when negative emotions originated from the opponent, both humans and GenAI consistently exhibited more selfish behavior, aligning with intuitive expectations. However, positive and ambiguous emotions from different sources led to varying behaviors between humans

and GenAIs. Therefore, GenAI did not demonstrate a superior ability in attributing the source of emotions predicted by Hypothesis 4a, nor did it effectively mitigate the influence of incidental emotions on decision-making as anticipated.

6.3.2.2 The impact of perceived opponent emotion on one-round emotional decision-making

The author conducted T-tests to analyze differences in allocation change rates under different perceived opponent emotion conditions. The heatmap results are as follows：

Figure 16: The heatmaps of different response sets

Note: Red indicates that dictators allocated significantly more when perceiving opponent emotion to be corresponding to the row compared to when perceiving opponent emotion to be corresponding to the column. Gray indicates no significant difference, while green indicates significantly less allocation. The significance level is 95%.

Clearly, the more similar the colors in the two heatmaps, the more alike the one-round emotional decision-making of the two groups of dictators. By counting the number of identical-colored cells (excluding the diagonal), the similarity can be estimated. GPT-4o demonstrated a 93.3% similarity with human participants, showing a significant altruistic tendency when perceiving opponent emotion as sadness or fear and a significant selfish tendency when perceiving opponent emotion as disgust. DeepSeek, on the other hand, displayed low level of alignment with humans.

The author also conducted an OLS regression analysis using relative allocation amounts as the dependent variable and the six categories of opponent emotions as binary independent variables.

To avoid multicollinearity, anger was excluded from the regression model. The results are as follows:

Table 12: Difference in relative allocation change rate under different perceived opponent emotion

		Perceived opponent emotion				
		Happiness	Sadness	Fear	Surprise	Disgust
Response set	$R_{h-relative}$	Not significant	+	+	Not significant	-
	$R_{g-relative}$	Not significant	+	+	Not significant	-
	$R_{ds-relative}$	Not significant	+	Not significant	Not significant	Not significant

Note: "-" means a negative and significant coefficient in the regression, indicating a selfish tendency; "+" means a positive and significant coefficient, indicating an altruistic tendency. The significance level is 95%.

Similar to the heatmap analysis, when the perceived opponent emotion was sadness or fear, both humans and GPT-4o significantly increased their allocation, indicating a higher degree of altruism. When the perceived opponent emotion was disgust, both significantly reduced their allocation, indicating a decrease in altruism. There were no significant changes in allocation when the opponent was perceived to be in other emotions. DeepSeek matched humans when perceiving the opponent as experiencing happiness, sadness, and surprise.

Based on the combined analysis of the heatmap and OLS regression, GPT-4o demonstrated a high level of similarity with humans in one-round emotional decision-making based on perceived opponent emotion, as predicted by Hypothesis 3b. In contrast, DeepSeek still have room for improvement in aligning with human. Thus， in Study 4 and subsequent research, the author focused exclusively on GPT-4o, as it demonstrated strong human-like one-round emotional decision-making capability, to further explore its human-like multi-round emotional decision-making potential.

7. Study 4: Determining the Similarity in Multi-Round Emotional Decision-Making between GenAI and Humans

7.1 Design and Participants

The author designed four e-commerce subtasks, each consisting of a subtask where customers interact with e-commerce customer service representatives (played by both human participants and GPT-4o). Customer service representatives (CSRs) receive customer inquiries in the form of a questionnaire. CSRs were evenly assigned to one of three groups: positive, neutral, or negative, where each group was presented with customer inquiries that varied in emotional tone and attitude. The positive group received inquiries that were friendly and polite, demonstrating the best customer attitude and most positive emotion. The neutral group received inquiries that were straightforward and neutral in emotional tone. The negative group received inquiries that were cold and unfriendly, with the worst customer attitude and most negative emotion.

For example, in the "product quality issue" subtask, the initial inquiry varies by group:

- Positive group: "*Hello, I received the product but noticed some issues. Could you please help me resolve this? Thank you!*"
- Neutral group: "*The quality of the product I received is problematic. Please handle this.*"
- Negative group: "*Why is the quality of your product so poor? What are you going to do about it?*"

After reviewing the customer's message, CSRs were tasked to select the most appropriate response they believed from three options, which are similar in meaning and length but differ in emotional tone and politeness. For the above inquiries, the three response options, ranging from the most polite and empathetic to the relatively less courteous, are:

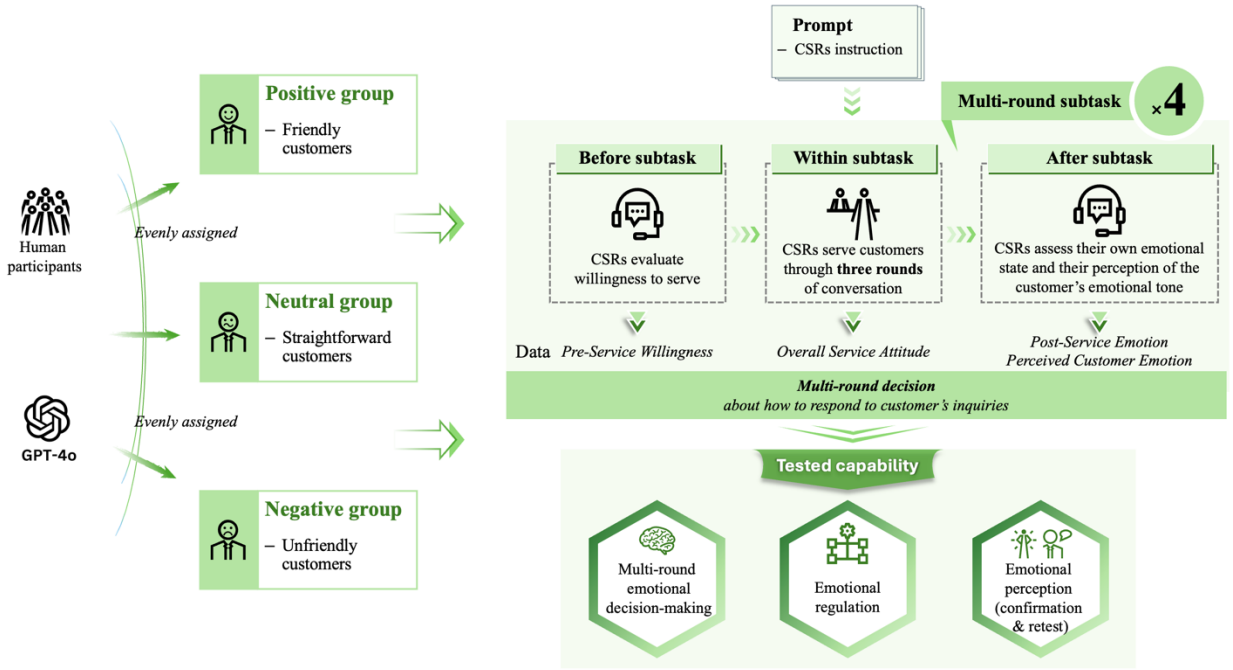
- "*We sincerely apologize! Could you please let us know what the issue is? You can briefly describe it or take a photo, and we will address it promptly to ensure your satisfaction.*"
- "*We apologize. Could you please specify the issue? Kindly describe it or provide relevant images, and we will assist you as soon as possible.*"
- "*Hello, could you please let us know what the specific issue is? You can briefly describe it or take a photo, and we will follow up to resolve it.*"

It is important to note that while the three options differ in emotional tone and politeness, they all maintain the professionalism and service standards expected of an e-commerce CSR.

Each subtask consists of three rounds of conversation. Before starting a subtask, CSRs are asked to rate their willingness to serve the next customer on 5-point Likert scale (Likert 1932), with 1 representing "least willing" and 5 representing "most willing". At the end of each subtask, they also assess their own emotional state and their perception of the customer's emotional tone using the same scale, where 1 represents "most negative" and 5 represents "most positive".

Before the first subtask, both human participants and GPT-4o receive a prompt outlining key aspects of customer service, emphasizing the importance of maintaining a friendly and professional attitude. The instructions highlight that while customer requests may sometimes be unreasonable and their tone may vary, CSRs should consistently provide excellent service and not let one interaction influence the next. This instruction is not repeated before the second to fourth subtasks. The specific study design is illustrated in Figure 17.

Figure 17: Visual representation of Study 4 design



To gather human answers, the author recruited 230 human participants from Credamo to fill out the questionnaires. Participants were evenly distributed among the positive, neutral, and negative groups.

To gather GPT-4o answers, the author accessed the official APIs of OpenAI GPT-4o (gpt-4o model) and initiated 50 sessions per group, answering the exact same questions as the human participants.

Responses from human participants and GPT-4o were analyzed for similarities and differences.

This study conforms to a 3 (external emotion: positive, neutral, and negative) between-subjects design. Both GenAI and human subjects were divided into three groups, each corresponding to a different external emotion condition (positive, neutral, or negative). The tasks performed by each group varied based on their assigned external emotion condition, but within the same external emotion condition, GenAI and humans performed identical tasks. The factor of multi-round emotional decision-making subject (GenAI vs human) was treated as a grouping variable to compare performance between the two groups.

7.2 Pre-Test

To ensure that the emotional tone of the pre-set customer inquiries in the positive, neutral, and negative groups progressively shifts from positive to neutral to negative, and that the three response options per round maintain consistent meaning while aligning with the intended emotional and attitudinal differences, the author conducted a pre-test.

Two human participants independently reviewed the pre-set customer inquiries for each group and the response options available to CSRs after each inquiry. For each subtask and inquiry round, the two participants read the three pre-set customer inquiries (without knowing their assigned group) and ranked them from most negative to most positive in emotional tone. If their rankings matched the author's intended grouping, the inquiries were retained. If discrepancies arose, the author revised the inquiries and the two participants repeated the ranking process until full agreement was reached. Similarly, for the response options available to CSRs after each inquiry, the two participants ranked them from most negative to most positive in emotional tone. If their rankings

aligned with the author's intended design, the options were kept. If not, the author refined the response options and repeated the ranking process until consensus was achieved.

7.3 Data Preprocessing and Validity Check

All 230 human responses passed the Red Herring Questions test. However, 33 participants were excluded due to short response times, which were considered insufficient for properly completing the questionnaire. In the end, the positive, neutral, and negative groups had 66, 63, and 68 responses, respectively, with average response times of 314, 298, and 304 seconds, respectively. The distribution of retained participants is as follows:

Table 13: The distribution of retained human participants in Study 4

		Group		
		Positive	Neutral	Negative
Gender	Female	74%	73%	79%
	Male	26%	27%	21%
Age	0-20	3%	3%	4%
	21-30	59%	54%	65%
	31-40	30%	41%	26%
	41-50	5%	2%	4%
	51-60	3%	0%	0%
City Tier[6]	Tier 1	20%	21%	16%
	Tier 2	42%	54%	66%
	Tier 3 or below	38%	25%	18%

Denote the final validated human response set and the response set of GPT-4o as R_h and R_g, respectively.

To facilitate data analysis, if a CSR selects the response option with the most positive emotion, it is recorded as 1; if they select the option with the relatively neutral emotion, it is recorded as 2; and if they choose the option with the most negative emotion, it is recorded as 3. This data can be

[6] According to the GYBrand China City Index (2025). https://www.10guoying.com/city/10808.html

used to assess the service attitude of a CSR during a particular inquiry, with a lower number indicating a more positive service attitude. By taking the average of the three responses from a CSR in the same subtask, the overall service attitude displayed by the CSR for that specific subtask is obtained.

Therefore, for each subtask, four pieces of data can be obtained, including Pre-Service Willingness, Overall Service Attitude, Post-Service Emotion, and Perceived Customer Emotion.

To check the consistency of the data, the author performed group-wise T-tests on the Pre-Service Willingness for subtask1 within each response set across the positive, neutral, and negative groups. If the data consistency is good, the results of the T-tests should be non-significant. The results are as follows:

Table 14: The p-values of Pre-Service Willingness difference for subtask1 in different groups

p-value	R_h	R_g
Neutral vs Positive	0.189	N/A
Negative vs Positive	0.577	N/A
Negative vs Neutral	0.456	N/A

For R_g, the Pre-Service Willingness for subtask1 in the positive, neutral, and negative groups was all 5, with a variance of 0 within each group, resulting in T-test results of N/A. For R_h, the group-wise differences were also non-significant at the 95% significance level.

To check the accuracy of customer emotion perception by CSRs across groups, the author conducted group-wise T-tests within each response set for Perceived Customer Emotion in each subtask for the positive, neutral, and negative groups. Theoretically, the Perceived Customer Emotion of the negative group should be significantly lower than that of the neutral and positive groups, with the neutral group also having a significantly lower value compared to the positive group. The actual T-test results are as follows:

Table 15: The difference of Perceived Customer Emotion in different groups

Response set	Group	Subtask1	Subtask2	Subtask3	Subtask4
R_h	Neutral vs Positive	↓	↓	↓	↓
	Negative vs Positive	↓	↓	↓	↓
	Negative vs Neutral	↓	↓	↓	Not significant
R_g	Neutral vs Positive	-	↓	↓	↓
	Negative vs Positive	↓	↓	↓	↓
	Negative vs Neutral	↓	↓	↓	↓

Note: "↓" means that the former is significantly smaller than the latter, indicating that the Perceived Customer Emotion of the former group is more negative. "-" means that both groups have a variance of 0, but the mean of the former group is smaller than that of the latter group, indicating that the Perceived Customer Emotion of the former group is more negative. The significance level is 95%.

The results show that there was no significant difference in the Perceived Customer Emotion between the neutral and negative groups for human participants in Subtask4, with mean values of 1.9 and 1.8, respectively. This suggests that human participants considered the neutral group in Subtask4 to be somewhat negative. Therefore, the two Pre-Test participants reviewed the pre-set customer inquiries for each group again, and they unanimously agreed that, since the same human participant only responds to one group and cannot compare the inquiries with those of other groups, it is reasonable to consider the inquiries of the neutral group in Subtask4 to be somewhat negative.

7.4 Results and Discussion

7.4.1 GenAI's Emotional Perception

Through the validation of customer emotion perception in the Pre-Test, it can be further confirmed that GPT-4o and humans have nearly identical perceptions of others' emotions, consistent with the findings of Study 1.

In addition, the author performed group-wise T-tests on the Post-Service Emotion of the positive, neutral, and negative groups for each subtask within each response set. The results are as follows:

Table 16: The difference of Post-Service Emotion in different groups

Response set	Group	Subtask1	Subtask2	Subtask3	Subtask4
R_h	Neutral vs Positive	Not significant	Not significant	Not significant	↓
	Negative vs Positive	↓	↓	↓	↓
	Negative vs Neutral	↓	↓	↓	Not significant
R_g	Neutral vs Positive	Not significant	Not significant	Not significant	Not significant
	Negative vs Positive	↓	↓	↓	↓
	Negative vs Neutral	↓	↓	↓	↓

Note: "↓" means that the former is significantly smaller than the latter, indicating that the Post-Service Emotion of the former group is more negative. The significance level is 95%.

The results show that the differences in Post-Service Emotion among groups for GPT-4o are largely in line with those observed in humans, supporting the findings from Study 2.

7.4.2 GenAI's Emotional Regulation

A cross response set T-test was conducted to compare the Overall Service Attitude between GPT-4o sessions and human participants, and the results are as follows:

Table 17: The difference of GPT-4o's and humans' Overall Service Attitude of different subtasks

Group	Subtask1	Subtask2	Subtask3	Subtask4
Positive	↓	↓	↓	↓
Neutral	↓	↓	↓	↓
Negative	↓	↓	↓	↓

Note: "↓" means that GPT-4o's Overall Service Attitude is significantly lower than that of the humans, indicating a better attitude. The significance level is 95%.

GPT-4o's Overall Service Attitude across all groups and subtasks is significantly better than that of humans.

To examine the changes in CSR Overall Service Attitude between two consecutive subtasks, the author conducted T-tests. The results are as follows:

Table 18: The difference of Overall Service Attitude between two consecutive subtasks

Response set	Group	Subtask2 vs Subtask1	Subtask3 vs Subtask2	Subtask4 vs Subtask3
R_h	Positive	↑	↓	↑
	Neutral	Not significant	↓	Not significant
	Negative	Not significant	↓	↑
R_g	Positive	=	=	=
	Neutral	=	=	=
	Negative	=	=	=

Note: "↓" means that the Overall Service Attitude of the later subtask is significantly lower than that of the previous, indicating the attitude turning better; "↑" means that the Overall Service Attitude of the later subtask is significantly higher than that of the previous, indicating the attitude turning worse; "=" means that both groups have a variance of 0, but the means are equal, indicating the attitude not changing. The significance level is 95%.

Human's Overall Service Attitude showed significant variability, experiencing periods of turning worse, better, and worse again, failing to meet the prompt's requirement to "consistently provide excellent service and not let one interaction influence the next." On the other hand, GPT-4o consistently maintained an Overall Service Attitude of 1 (the best level) across all groups and subtasks, with zero variance, demonstrating exceptional emotional regulation and professional service standards and significantly outperforming humans.

From the perspective of Pre-Service Willingness, the author conducted subtask-wise T-tests between consecutive subtasks within each response set for the positive, neutral, and negative groups. The results are as follows:

Table 19: The difference of Pre-Service Willingness between two consecutive subtasks

Response set	Group	Subtask2 vs Subtask1	Subtask3 vs Subtask2	Subtask4 vs Subtask3
R_h	Positive	Not significant	↓	Not significant
	Neutral	Not significant	↓	Not significant
	Negative	↓	↓	Not significant
R_g	Positive	=	=	=
	Neutral	=	=	=
	Negative	=	=	=

Note: "↓" means that the Pre-Service Willingness of the later subtask is significantly lower than that of the previous, indicating a decrease in Pre-Service Willingness; "=" means that both subtasks have a variance of 0, but the means are equal, indicating Pre-Service Willingness not changing. The significance level is 95%.

Human participants showed a significant decrease in Pre-Service Willingness after completing subtask2. In contrast, GPT-4o consistently maintained the highest level of Pre-Service Willingness at 5, indicating high stability.

Overall, GPT-4o significantly outperformed humans in both Overall Service Attitude and Pre-Service Willingness, consistently maintaining a stable service attitude and professional standards. This demonstrates superior emotional regulation capabilities compared to humans, aligning with the prediction of Hypothesis 4b. In this case, GPT-4o can be applied to enhance customer service by maintaining a consistently professional and empathetic attitude, reducing emotional bias, and handling repetitive or challenging tasks. Additionally, with its ability to augment employee creativity (Jia et al. 2024), it already possesses a strong foundational capability for widespread application in the customer service sector.

8. Study 5: Determining the Existence of Boundary of Similarity between GenAI and Humans

8.1 Study 5a: Determining the Existence of Boundary of Similarity in the Context of High-Tech Innovation

8.1.1 Design and Participants

The author created a total of four high-tech innovation product descriptions in Chinese, namely Head-on (brain-computer interface headset), VisioLink (augmented reality smart glasses), RunFit Pro (smart running shoes), and RelaxPro 360 (smart massage chair). Each high-tech innovation product description includes a product overview, an appearance description, and a core feature introduction highlighting 3-4 functionalities not currently offered by competitors.

For example, the product overview for Head-on is: "*Head-on is the latest brain-computer interface (BCI) headset that enables seamless connectivity with the digital world by capturing and interpreting your brainwaves. Unlike traditional BCIs, Head-on features a completely non-invasive design, requiring no hardware implants. Simply wear this sleek headset to control everything with your mind—whether at work, gaming, or in daily life. Head-on offers an unparalleled smart experience, eliminating the need for manual interaction*".

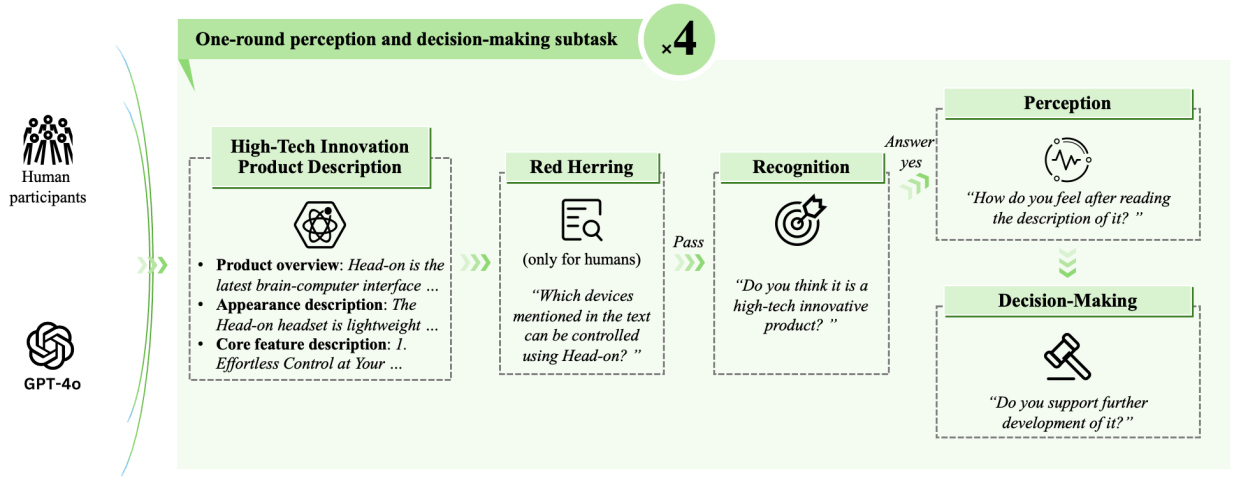
The appearance description is: "*The Head-on headset is lightweight, comfortable, and made with soft materials and a streamlined design that fits perfectly on your head. Its modern, minimalist aesthetic ensures it's suitable for extended wear. Equipped with multiple micro-electrode sensors, it captures brainwave signals in real time to decode your thoughts*".

The core feature introduction is: "*1. Effortless Control at Your Fingertips: With Head-on's brainwave sensors, you can directly control smart home devices, cars, and office equipment using your thoughts. Adjust temperature, play music, or operate appliances without lifting a finger, making your life more efficient and convenient. 2. Real-Time Health Monitoring: Head-on continuously monitors your brainwaves, providing precise feedback on your emotions, stress, and anxiety levels. It offers personalized stress-relief recommendations, helping you maintain mental well-being and inner balance. 3. Immersive Virtual Reality Interaction: With Head-on, you can interact with virtual worlds without controllers. Control virtual characters or objects using your mind for a more natural and immersive experience, breaking the boundaries between reality and*

virtuality. 4. Enhanced Memory and Cognitive Training: Head-on not only boosts focus and learning efficiency but also customizes cognitive training programs based on your needs. Through brainwave stimulation and training, it helps keep your brain active and supports peak performance in work and study".

The specific study design is illustrated in Figure 18.

Figure 18: Visual representation of Study 5a design



To gather human responses, the author recruited 253 participants from Credamo. Participants were informed that they would act as executives of a large tech company reviewing the latest product development proposals from their R&D team. Each participant read all four product descriptions. After reading each description, participants first answered 2-3 Red Herring Questions to confirm they had fully read and understood the product information. Participants were then asked to evaluate whether they recognized the product as a high-tech innovation. For participants who recognized the product as a high-tech innovation, a 7-point Likert scale (Likert 1932) was used to assess their emotional perception after reading the product description and their emotional decision-making regarding their level of support for the product's further development. The order of the four product descriptions was randomized for each participant.

To gather GenAI responses, the author accessed the official APIs of OpenAI GPT-4o (gpt-4o model) and initiated 200 sessions. Each session processed all four product descriptions and completed the same inquiries as human participants (excluding Red Herring Questions).

Responses from human participants and GenAI were analyzed for similarities and differences.

This study conforms to a within-subject design. All participants, regardless of whether they were GenAI or human, completed the same set of tasks. The factor of emotional perception and decision-making subject (GenAI vs human) was treated as a grouping variable to compare performance between the two groups.

8.1.2 Data Preprocessing

54 participants were excluded due to unreasonable response times, either too short to be considered sufficient for properly completing the questionnaire or too long to be considered attentive. In the end, 199 human participants' responses were retained, with an average response time of 490 seconds. Among them, 23, 43, 32, and 61 participants failed the Red Herring Questions for Head-on, VisioLink, RunFit Pro, and RelaxPro 360, respectively, and were thus excluded from the analysis of the corresponding products. The distribution of retained participants is as follows:

Table 20: The distribution of retained human participants in Study 5a

		High-tech Innovation Product			
		Head-on	VisioLink	RunFit Pro	RelaxPro 360
N		176	156	167	138
Gender	Female	70%	69%	71%	69%
	Male	30%	31%	29%	31%
Age	0-20	4%	4%	4%	4%
	21-30	63%	63%	64%	59%
	31-40	28%	28%	26%	30%
	41-50	3%	4%	4%	6%
	51-60	1%	1%	1%	1%
City Tier[7]	Tier 1	28%	26%	26%	28%
	Tier 2	53%	54%	53%	53%
	Tier 3 or below	18%	20%	21%	20%

[7] According to the GYBrand China City Index (2025). https://www.10guoying.com/city/10808.html

8.1.3 Results and Discussion

The author first examined the recognition of high-tech innovation for the four products by GenAI and humans. Among the humans who passed the Red Herring Questions, 99%, 100%, 98%, and 96% recognized Head-on, VisioLink, RunFit Pro, and RelaxPro 360 as high-tech innovations, respectively, while GPT-4o recognized all these products as high-tech innovations in all the sessions. From the perspective of innovation recognition, there was no great difference between GPT-4o and humans.

Denote the responses of humans who both passed the Red Herring Questions and recognized the products as high-tech innovations as R_{h-h}, while the response set of GPT-4o was represented as R_{g-h}. A T-test was conducted to compare R_{h-h} and R_{g-h}, and the results are as follows:

Table 21: The difference of emotional perception and decision-making of high-tech innovation between GPT-4o and humans

		High-tech Innovation Product			
		Head-on	VisioLink	RunFit Pro	RelaxPro 360
Emotional Perception	R_{h-h} mean	5.87	5.94	5.52	5.55
	R_{g-h} mean	6.09	7.00	6.35	6.96
	R_{g-h}vs R_{h-h} difference	↑	↑	↑	↑
Emotional Decision-Making	R_{h-h} mean	6.19	6.26	5.91	5.97
	R_{g-h} mean	7.00	7.00	7.00	7.00
	R_{g-h} vs R_{h-h} difference	↑	↑	↑	↑

Note: "↑" means that GPT-4o's emotional perception is significantly more positive than that of humans, or that GPT-4o shows significantly greater support for the further development of the product compared to humans. The significance level is 95%.

After reading the description of any of the high-tech innovation products, GPT-4o's perceived emotions and the decisions made under such emotions were significantly more positive than those of humans, even though humans already exhibited highly positive emotions and made highly positive decisions.

Additionally, the author used a T-test to examine the differences in emotional perception and decision-making between GenAI and humans across different products. The results are as follows:

Table 22: The difference of emotional perception and decision-making across different high-tech innovation products

		High-tech Innovation Product					
		Head-on vs VisioLink	Head-on vs RunFit Pro	Head-on vs RelaxPro 360	VisioLink vs RunFit Pro	VisioLink vs RelaxPro 360	RunFit Pro vs RelaxPro 360
Emotional Perception	R_{h-h}	Not significant	↑	↑	↑	↑	Not significant
	R_{g-h}	↓	↓	↓	↑	↑	↓
Emotional Decision-Making	R_{h-h}	Not significant	↑	↑	↑	↑	Not significant
	R_{g-h}	=	=	=	=	=	=

Note: "↑" means that the emotional perception after reading the description of the former product is significantly more positive than after reading the description of the latter product, or that the support for further development of the former product is significantly greater than for the latter product. "↓" means the opposite. "=" means that the emotional perception or decision-making after reading the descriptions of the two products are completely the same. The significance level is 95%.

In terms of emotional perception, GPT-4o and humans only showed consistency in the cases of VisioLink vs. RunFit Pro and VisioLink vs. RelaxPro 360. For humans, although the differences in emotional positivity were not significant when comparing Head-on vs. VisioLink and RunFit Pro vs. RelaxPro 360, the direction of these differences was consistent with that of GPT-4o.

Regarding emotional decision-making, since GPT-4o consistently chose to support the further development of all the four products with maximum intensity (selecting 7 on the 7-point Likert scale in all cases), there were no significant differences among its responses, but it differed considerably from humans. This also indicates that GPT-4o's decision-making on whether to support the further development of high-tech innovation products is less influenced by the emotions evoked by the product descriptions compared to humans.

Clearly, the similarity and consistency between GPT-4o and humans in emotional perception and decision-making observed in previous studies no longer appears here, suggesting that such

similarity and consistency have boundaries in the context of high-tech innovation, as predicted by Hypothesis 5a. Compared to humans, GPT-4o more actively recognizes the innovativeness of products and shows greater support for their further development, demonstrating encouragement and admiration for innovation.

8.2 Study 5b: Determining the Existence of Boundary of Similarity in the Context of Radical Innovation

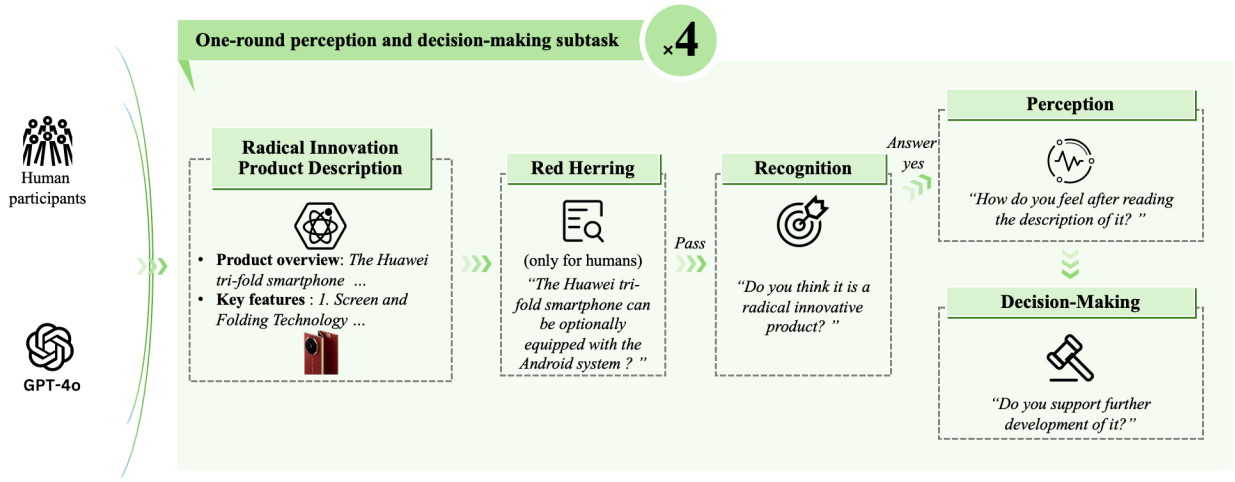
8.2.1 Design and Participants

To determine whether the disappearance of GenAI-human alignment observed in Study 5a is specific to the high-tech innovation domain or extends to highly innovative fields in general, the author replicated Study 5a in the context of radical innovation. Four radical innovations were selected from Time magazine's "THE BEST INVENTIONS OF 2024" (Time 2024), namely Tri-Fold Smartphone, ForeverGone, DermaSensor, and Galy Literally Cotton, and their product descriptions were written based on Time's introduction and the products' official websites. Each radical innovation product description consists of a product overview and 3-5 key features, with the appearance description replaced by product images.

Since there is no universally accepted definition of radical innovation (Garcia and Calantone 2002), the author provided a relatively clearer and more study-relevant definition in the questionnaire: "Radical innovation refers to highly novel advancements that break from the status quo and emerge from non-obvious paths or ideas, presenting both significant challenges and opportunities. In contrast, incremental innovation involves a lower degree of novelty, focusing on the improvement of existing products" (Souto 2015).

The specific study design is illustrated in Figure 19.

Figure 19: Visual representation of Study 5b design



Similar to Study 5a, the author recruited 272 participants respectively from Credamo. Each participant read all four product descriptions. After reading each description, participants first answered 2 Red Herring Questions to confirm they had fully read and understood the product information. Participants were then asked to evaluate whether they recognized the product as a radical innovation. For participants who recognized the product as a radical innovation, a 7-point Likert scale (Likert 1932) was used to assess their emotional perception after reading the product description and their emotional decision-making regarding their level of support for the product's further development. The order of the four product descriptions was randomized for each participant.

To gather GenAI responses, the author accessed the official APIs of OpenAI GPT-4o (gpt-4o model) and initiated 200 sessions. Each session processed all four product descriptions and completed the same inquiries as human participants (excluding Red Herring Questions).

Responses from human participants and GenAI were analyzed for similarities and differences.

This study conforms to a within-subject design. All participants, regardless of whether they were GenAI or human, completed the same set of tasks. The factor of emotional perception and decision-making subject (GenAI vs human) was treated as a grouping variable to compare performance between the two groups.

8.2.2 Data Preprocessing

81 participants were excluded, respectively, due to unreasonable response times—either too short to be considered sufficient for properly completing the questionnaire or too long to be considered attentive. Thus, 191 human participants' responses were retained, with an average response time of 393 seconds. Among them, 33, 46, 5, and 24 participants failed the Red Herring Questions for Tri-Fold Smartphone, ForeverGone, DermaSensor, and Galy Literally Cotton, respectively, and were thus excluded from the analysis of the corresponding products. The distribution of final retained participants is as follows:

Table 23: The distribution of retained human participants in Study 5b

		Radical Innovation Product			
		Tri-Fold Smartphone	ForeverGone	DermaSensor	Galy Literally Cotton
N		158	145	186	167
Gender	Female	73%	71%	75%	73%
	Male	27%	29%	25%	27%
Age	0-20	8%	8%	8%	8%
	21-30	62%	65%	60%	62%
	31-40	27%	24%	28%	27%
	41-50	2%	1%	2%	2%
	51-60	1%	2%	2%	1%
City Tier[8]	Tier 1	30%	28%	29%	30%
	Tier 2	46%	50%	47%	46%
	Tier 3 or below	24%	22%	24%	24%

8.2.3 Results and Discussion

The author first assessed how GenAI and humans recognized radical innovations. Among humans who passed the Red Herring Questions, 91%, 99%, 95%, and 96% recognized Tri-Fold Smartphone, ForeverGone, DermaSensor, and Galy Literally Cotton as radical innovations, respectively. GPT-4o consistently recognized all these products as radical innovations across all

[8] According to the GYBrand China City Index (2025). https://www.10guoying.com/city/10808.html

sessions. From an innovation recognition perspective, there was no significant difference between GPT-4o and humans, aligning with the findings of Study 5a.

Denote the responses of humans who both passed the Red Herring Questions and recognized the products as radical innovations as R_{h-r}, while the response sets of GPT-4o was represented as R_{g-r}. A T-test was conducted to compare R_{h-r} and R_{g-r}, and the results are as follows:

Table 24: The difference of emotional perception and decision-making of radical innovation between GPT-4o and humans

		Radical Innovation Product			
		Tri-Fold Smartphone	ForeverGone	DermaSensor	Galy Literally Cotton
Emotional Perception	R_{h-r} mean	6.09	5.60	5.55	5.41
	R_{g-r} mean	6.01	6.61	6.86	6.97
	R_{g-r}vs R_{h-r} difference	Not Significant	↑	↑	↑
Emotional Decision-Making	R_{h-r} mean	6.27	6.24	6.31	5.95
	R_{g-r} mean	6.95	7.00	7.00	7.00
	R_{g-r} vs R_{h-r} difference	↑	↑	↑	↑

Note: "↑" means that GPT-4o's emotional perception is significantly more positive than that of humans, or that GPT-4o shows significantly greater support for the further development of the product compared to humans. The significance level is 95%.

After reading the descriptions of radical innovation products, GPT-4o's perceived emotions and the decisions made under those emotions were significantly more positive than those of humans, even though humans had already exhibited highly positive emotions and made highly positive decisions. The only exception was Tri-Fold Smartphone, where GPT-4o's perceived emotions showed no significant positivity difference compared to humans.

Additionally, the author used a T-test to examine the differences in emotional perception and decision-making between GenAI and humans across different products. The results are as follows:

Table 25: The difference of emotional perception and decision-making across different radical innovation products

		Radical Innovation Product					
		Tri-Fold Smartphone vs ForeverGone	Tri-Fold Smartphone vs DermaSensor	Tri-Fold Smartphone vs Galy Literally Cotton	ForeverGone vs DermaSensor	ForeverGone vs Galy Literally Cotton	DermaSensor vs Galy Literally Cotton
Emotional Perception	R_{h-r}	↑	↑	↑	Not significant	Not significant	Not significant
	R_{g-r}	↓	↓	↓	↓	↓	↓
Emotional Decision-Making	R_{h-r}	Not significant	Not significant	↑	Not significant	↑	↑
	R_{g-r}	↓	↓	↓	=	=	=

Note: "↑" means that the emotional perception after reading the description of the former product is significantly more positive than after reading the description of the latter product, or that the support for further development of the former product is significantly greater than for the latter product. "↓" means the opposite. "=" means that the emotional perception or decision-making after reading the descriptions of the two products are completely the same. The significance level is 95%.

In terms of emotional perception, GPT-4o and humans did not exhibit consistency in any of the product comparisons. From this T-test, it is also evident that the exception observed with Tri-Fold Smartphone—where GPT-4o's perceived emotions showed no significant positivity difference compared to humans—may have been due to the fact that all human participants were from China. When faced with the Chinese-made Tri-Fold Smartphone, a sense of national pride may have triggered significantly more positive emotions compared to the other products. To further investigate, the author initiated 50 additional GPT-4o sessions, instructing GenAI to adopt the role of a Chinese person. After reading the Tri-Fold Smartphone description again, GPT-4o's emotional perception mean significantly increased to 6.28 (p=0.000), which was significantly higher than the human mean of 6.09 (p=0.005), once again showing a divergence from humans.

Regarding emotional decision-making, without being prompted to adopt the role of a Chinese person, GPT-4o consistently chose to support the further development of all products except Tri-Fold Smartphone with maximum intensity (selecting 7 on the 7-point Likert scale in all cases). However, after being instructed to assume the role of a Chinese person, GPT-4o also chose to support the further development of Tri-Fold Smartphone with maximum intensity across all

sessions. Thus, there were almost no significant differences among its responses, but it differed considerably from humans. This result is also consistent with the findings of Study 5a.

Clearly, consistent with the results of Study 5a, the similarity and consistency between GPT-4o and humans in emotional perception and decision-making observed in previous studies do not exist in the context of radical innovation, as predicted by Hypothesis 5b, with GPT-4o exhibiting more encouragement and admiration for innovation than humans. Moreover, this study tested the use of both text and images to evoke emotional perception and decision-making in GenAI and humans, and similar boundary to those observed in Study 5a, which used only text, still persists.

9. General Discussion

9.1 Overview of Studies

In this paper, six studies were conducted to explore the aforementioned issues and validate the aforementioned hypotheses (see Table 26). Study 1 and 2 investigated the similarities between GenAI and humans in emotional perception (Hypothesis 1 & 2). Study 3 examined the similarities between GenAI and humans in one-round emotional decision-making (Hypothesis 3a & 3b) and explored whether GenAI exhibits superior ability in attributing the source of emotions compared to humans (Hypothesis 4a). Study 4 explored the similarities between GenAI and humans in multi-round emotional decision-making and investigated whether GenAI demonstrates superior emotional regulation compared to humans (Hypothesis 4b). Study 5a and Study 5b were extension studies, exploring whether the aforementioned similarities have boundaries and whether they diminish in highly innovative domains (Hypothesis 5).

Table 26: Overview of studies

Study	Number of human participants	Number of GenAI sessions	Design	Main findings
Study 1	200	GPT-4o: 200 Doubao: 200 Kimi: 200 DeepSeek: 200	Within-subject design with 6 × 2 conditions	1. GenAI's ability to perceive emotions of others closely mirrors human emotional perception, with DeepSeek and GPT-4o demonstrating the best performance. 2. The more explicit the emotional intensity in the text, the more similar GenAI's ability to perceive emotions becomes to that of humans.
Study 2	200	GPT-4o: 200 Doubao: 200 Kimi: 200 DeepSeek: 200	Within-subject design with 6 conditions	1. GenAI's ability to perceive emotions of oneself closely mirrors human emotional perception, with DeepSeek and GPT-4o demonstrating the best performance.
Study 3	242	GPT-4o: 100 DeepSeek: 14,400	Within-subject design with 6 × 2 × 6 conditions	1. GenAI's one-round emotional decision-making, based on its own emotions, closely resembles that of humans. 2. GenAI does not demonstrate superior ability in attributing the source of emotions nor effectively mitigate the influence of incidental emotions on decision-making. 3. GPT-4o exhibits a high level of similarity with humans in one-round emotional decision-making based on perceived opponent emotion, while DeepSeek performs poorly in this regard.
Study 4	197	GPT-4o: 150	Between-subjects design	1. GPT-4o demonstrates superior emotional regulation compared to humans
Study 5a	191	GPT-4o: 200	Within-subject design	1. The similarity and consistency between GPT-4o and humans in emotional perception and decision-making observed in previous studies no longer appears in the context of high-tech innovation and radical innovation. 2. Regardless of whether text alone or text + images are used to evoke emotional perception and decision-making in GenAI and humans, such boundaries exists.
Study 5b	191	GPT-4o: 200+50	Within-subject design	

9.2 Summary of Findings

The author employed four methods—custom algorithm, Pearson Correlation, Cosine Similarity, and Jensen-Shannon Divergence (JSD)—to assess the similarity in emotional perception between GenAI and humans. The results indicate that GenAI's ability to perceive emotions closely aligns with human perception, particularly in perceiving happiness. Meanwhile, emotional intensity plays a significant role in GenAI's emotion perception accuracy. While GenAI excels at recognizing explicit emotions, there is still room for improvement in detecting more subtle emotional cues. Among the GenAIs tested, DeepSeek and GPT-4o emerged as the most effective and consistent performer.

The author studied the similarities between GenAI and humans in one-round emotional decision-making through the Dictator Game. Regarding the impact of participant emotion, both GPT-4o and DeepSeek showed considerably high consistency with humans, with the only difference occurring when participant emotion was surprise. Regarding the impact of participant emotion source, when participant emotion was positive or ambiguous, the impact of participant emotion source on GenAI's one-round emotional decision-making differed from that on humans. GenAI did not exhibit the intuitive altruistic tendency when perceiving integral happiness. When perceiving negative emotions originated from the opponent, both humans and GenAI consistently exhibited more selfish behavior, which aligns with intuitive expectations. Therefore, GenAI did not demonstrate superior ability in attributing the source of emotions compared to humans. Regarding the impact of perceived opponent emotion on one-round emotional decision-making, GPT-4o demonstrated a high degree of similarity to human responses, showcasing its robust capability in understanding and reacting to emotional cues. However, DeepSeek's performance was less promising in this context, despite its emotional perception abilities being closer to human standards.

The author also studied the similarities between GenAI and humans in multi-round emotional decision-making within the context of e-commerce customer service. The findings reveal that GPT-4o demonstrated better emotional regulation compared to humans, with its service quality being less influenced by external factors and being able to maintain a stable service attitude and professional standards.

The author narrowed down the topic from general stories/news articles to high-tech innovation and radical innovation product descriptions and compared the emotional perception and decision-making of GPT-4o and humans after reading these texts or reading text alongside images. The results revealed that GPT-4o exhibited significantly more positive emotional perception and decision-making than humans, indicating that the similarity between GenAI and humans in emotional perception and decision-making currently has boundaries. The modality used to evoke emotional perception and decision-making in GenAI and humans—whether text-only or text + images—does not influence this outcome.

9.3 Theoretical Implications

The theoretical significance of this study lies in its exploration of GenAI's emotional perception and emotional decision-making capabilities, their similarity to humans, and the boundaries of this similarity, thereby providing a theoretical basis for advancing GenAI's emotion-related capabilities. Specifically, the study has theoretical implications in the following ways:

First, the paper highlights that GenAI like GPT-4o and DeepSeek can closely align with human emotional perception, particularly in perceiving explicit emotions. This suggests that GenAI can effectively simulate certain aspects of human emotional intelligence, contributing to the theoretical understanding of how GenAI perceives and interprets emotions.

Second, the paper proposes a measurement framework and a practical experimental design to evaluate the similarity between GenAI and humans in emotional perception and decision-making. As more advanced GenAIs emerge in the future, this framework and methodology can still be applied to assess the progress of GenAI's emotional perception and decision-making capabilities.

Third, the paper identifies that the similarity between GenAI and humans has boundaries in the context of highly innovative innovation, where this similarity diminishes. This emphasizes the need for more nuanced GenAIs. Additionally, researchers in other specialized fields can use similar methods to examine whether such boundaries exist in their respective domains, providing valuable insights for further research.

Forth, the paper uncovers the strengths and weaknesses of the tested GenAIs in terms of their emotion-related capabilities. For instance, Kimi and Doubao need to improve their ability to

perceive emotions from static text that align with human standards. DeepSeek, while unparalleled in emotional perception, still needs to enhance its emotional decision-making capabilities to increase its similarity to humans. GPT-4o performs well overall but must continue to push the boundaries of its existing similarity to humans, extending this similarity to more domains such as high-tech innovation and radical innovation, thereby empowering industries with high demand for GenAI. Furthermore, even GPT-4o and DeepSeek, which excel in emotional perception, do not demonstrate ability in attributing the source of emotions that surpass those of humans. Future GenAIs could develop this ability to assist humans in making rational decisions.

In summary, this paper not only advances the theoretical understanding of GenAI's emotion-related capabilities but also provides actionable insights for improving and expanding these capabilities across various theoretical domains.

9.4 Practical Implications

The findings of the paper suggest that current GenAIs have achieved a high level of consistency with humans in emotional perception, although there are still some differences in capabilities among various GenAIs. At the same time, there is no significant evidence to indicate that GenAI possesses abilities of attributing the source of emotions that surpass those of humans. In terms of emotional decision-making, a few GenAIs have already demonstrated advanced human-like capabilities, even exhibiting emotional regulation abilities that exceed those of humans. Additionally, the consistency between GenAI and humans currently has boundaries, and such similarity disappears in the context of high-tech innovation and radical innovation. These results shed light on practices across various industries in several aspects.

Generally speaking, the findings suggest that GenAI can be used in applications requiring emotional perception, such as mental health support, education, and entertainment, where perceiving, understanding and responding to human emotions is critical. However, the paper highlights the need for caution when deploying GenAI in contexts requiring the detection and perception of subtle emotional cues, such as negotiation, therapy, or conflict resolution. In such scenarios, more advanced GenAIs like GPT-4o and DeepSeek are needed. Moreover, if businesses aim to leverage GenAI's emotional decision-making capabilities to drive growth, they must select GenAIs with more prominent and better-suited capabilities for their specific needs.

For the customer service industry, utilizing GenAI APIs (especially GPT-4o's) to leverage their strong emotional perception and decision-making abilities, as well as their superior emotional regulation capabilities compared to humans, is a good option. Relevant enterprises can customize guidelines and scripts for GenAI based on actual business needs, gradually replacing human customer service agents with GenAI or retaining only a small number of human agents for VIP customer one-on-one services or resolving major issues. On one hand, this will significantly reduce costs for businesses; on the other hand, it will extend customer service hours, ensure timely responses to customer needs, and improve satisfaction.

For innovation-driven, technology-intensive enterprises, using GenAI for innovation decision-making is still premature. Further advancements in GenAI capabilities are needed, or companies can develop customized GenAIs tailored to their specific data and requirements.

9.5Limitations and Future Research Directions

While interpreting the findings and their theoretical and practical implications, it is also of great significance to acknowledge areas for improvement. This paper has limitations that may open avenues for future research.

First, this paper mainly used text to stimulate GenAI's emotional perception and emotional decision-making. In reality, information from different modalities may lead to varying results in emotional perception and decision-making. For instance, videos, and other forms of media contain rich contextual information that could potentially interfere with GenAI's judgment, thereby affecting its similarity to humans. Future research could explore the use of different modalities—such as videos, and audios—or combinations of multimodal information to stimulate GenAI's emotional perception and decision-making. This would allow for a comparison of the similarity between GenAI and humans in interpreting and responding to information across different modalities.

Second, the paper relied on self-reported measures of human emotion and decision-making. However, different human participants may have varying interpretations of emotions, making it difficult to establish a unified objective standard. Future research could employ more objective indicators, such as facial expression recognition Apps or voice recognition technologies, to reduce

reliance on questionnaires when capturing emotional responses. In addition, due to limitations of the Credamo platform, all human participants in this paper were from China, which may introduce regional bias. Future studies should consider expanding participant samples to a global population.

Furthermore, on the application side of GenAI, this paper provides limited discussion on the ethical implications of emotion-aware GenAI in persuasive contexts (e.g., marketing, mental health), which warrants further exploration. As GenAI technologies achieve breakthrough advancements in the future, their emotional perception and decision-making capabilities may evolve, necessitating further exploration of their similarities with humans.

In conclusion, this paper has contributed to the research on GenAI's emotional perception and decision-making capabilities, their similarity to humans, and the boundaries of this similarity. The findings hold significance for both researchers and practitioners seeking to leverage GenAI. Nevertheless, additional research is essential to delve deeper into this evolving and promising field.

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Appendix

Appendix 1: Questionnaire for Study 1

Welcome to this research.

【Red Herring - Section Starts】

1. This question is designed to assess the respondent's attentiveness. Please select "Very Dissatisfied." [Single Choice]

○ Very Dissatisfied

○ Dissatisfied

○ Satisfied

○ Very satisfied

【Red Herring - Section Ends】

【Demographics - Section Starts】

1. Please select your gender [Single choice]

○ Male

○ Female

2. Please select your age group [Single choice]

○ 0-20 years old

○ 21-30 years old

○ 31-40 years old

○ 41-50 years old

○ 51-60 years old

○ 60 years old and above

3. Please select your city [City]

【Demographics - Section Ends】

Notes: After this section, participants were assigned to read 24 stories and answer corresponding questions. The order of the 24 stories and the 6 options for each participant are randomized. The author marked each story's pre-classified emotion and emotional intensity in gray italics, but these were not shown to human participants when answering the questions.

【Questions - Section Starts】

1. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<happiness, subtle>*

She sat alone in the corner of the café, gazing out the window. Sunlight streamed through the glass, casting a warm glow on her table, while steam rose from her coffee in the light. She gently stirred her coffee, took a small sip, and leaned back in her chair with her eyes closed, as if immersed in a silent sense of contentment. After a moment, she opened her eyes and continued to gaze out the window with a subtle sense of satisfaction. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

2. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<happiness, subtle>*

The boy stopped on his way home and looked down at a small wildflower by the roadside. He bent down, gently cupped the flower in his hands, observed it for a moment, and then carefully placed it back in its original spot. As he stood up, he seemed to smile softly before turning and continuing his walk home. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

3. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<sadness, subtle>*

The morning sunlight streamed through the gap in the curtains, casting a warm glow into the room. The air was still filled with the lingering scent of the peppermint tea she had brewed the night before. She looked down at the open letter on the table, her fingertips gently tracing the paper. The corners of her lips lifted slightly, yet her eyes shimmered with a complex emotion. She carefully folded the letter, slowly placing it back into the envelope, her hands gently sealing it as if reluctant to touch it again. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

4. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<sadness, subtle>*

The girl opened an old diary, her fingertips lingering on a yellowed page. She stared at a line of crooked handwriting for a long time. The corners of her lips lifted slightly, but soon she gently closed the diary, placed it back in the drawer, as if afraid to touch something, and slowly locked it. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

5. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<fear, subtle>*

He sat in a chair in the room, quietly looking at a painting on the wall. It depicted a vast, open field with grass gently swaying in the wind. The painting had been hanging there for many years, yet he couldn't help but feel that it looked slightly different today. The small shadow in the corner seemed darker than he remembered. He slowly shifted his gaze away, wondering if he was overthinking it. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

6. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<fear, subtle>*

She was chopping vegetables in the kitchen when she casually looked up through the window. The neighbor's curtain moved slightly. She paused for a moment, focusing intently in that direction, but soon lowered her head and continued preparing dinner. However, a small voice in her mind kept reminding her of what she had just seen. Perhaps it was just the wind lifting the curtain, but she didn't completely relax. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

7. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<surprise, subtle>*

He was flipping through an old family photo album, browsing through familiar pictures page by page. Suddenly, he stopped at a blurry photo—there was a stranger he didn't recognize standing at the doorstep of his childhood home, seemingly smiling at the camera. None of the other photos in the album showed this person, not even a trace. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

8. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<surprise, subtle>*

He returned home and, as usual, opened the door. But when he looked down, he noticed a pair of shoes that didn't belong to him. They seemed to have been placed there just recently, with dust on the soles still clearly visible. He looked up into the house—everything appeared orderly, with no signs of anyone else coming or going. He stood at the doorway for a moment, gently set down his keys, and felt a strange ripple in his heart. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

9. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<anger, subtle>*

He walked into the kitchen and saw a mess on the dining table—an open snack bag, breadcrumbs scattered across the surface, and even half a cup of spilled milk. He silently observed the scene, took a quiet breath, and reached out to place the milk cup back in its spot. Without saying a word, he began to clean up, but his movements were slightly quicker than usual. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

10. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<anger, subtle>*

She sat in the café, waiting for her friend. Half an hour had passed, and the phone calls went unanswered. Her coffee cup was already empty, and the waiter had come by several times to ask if she wanted a refill, but she shook her head each time. She stared at the empty cup, her fingers gently tapping on the table, with a slightly stiff smile on her lips. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

11. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<disgust, subtle>*

She sat on a bench in the park, watching the passersby hurry along. Her hand unconsciously touched the back of the bench—it felt slightly sticky. The surroundings remained as beautiful as ever. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

12. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<disgust, subtle>*

In the gallery, Lin Tao stood in front of a painting, tilting his head slightly. The colors in the painting were somewhat unusual, and he didn't immediately look away. The unconventional color scheme made him feel a slight sense of unease. He blinked gently and turned to walk toward the next exhibition area. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

13. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<happiness, explicit>*

She looked through the window into the distance. Pedestrians hurried along the street, but her gaze lingered on the sunlight-dappled shadows of the trees. A gentle breeze swayed the branches, casting scattered patches of light. She closed her eyes, took a deep breath, and quietly savored this moment of tranquility. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

14. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<happiness, explicit>*

She walked out of the subway station with a weary body, the streetlights glowing warm and bright. Her pace quickened unconsciously as she imagined the soft sofa and steaming hot dinner at home. Despite the chill outside, a sense of warmth surged within her. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

15. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<sadness, explicit>*

At night, the rain pounded against the window, and the office lights were dim. Wang Jin stared at the documents on the desk, his brows furrowed, and his eyes slightly blurred. He let out a soft sigh, turned to the window, and gazed at the hazy street view outside, allowing a raindrop to slide down from the window frame. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

16. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<sadness, explicit>*

In the park's corridor, Lin Yue walked slowly. She stopped and looked at the fallen petals, feeling empty inside. The birds' chirping around her was still clear, but she couldn't feel that lightness. The wind blew past, taking the last warmth away, and she sighed softly before continuing on. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

17. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<fear, explicit>*

In the living room at night, he sat alone on the couch, the flickering light from the TV casting shadows on his face. Suddenly, a blurry face appeared on the screen. He froze for a few seconds,

reached out to turn off the TV, and stared at the reflection on the dark screen, his heartbeat quickening as though the eyes on the screen were still watching him. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

18. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<fear, explicit>*

He was searching through old belongings in the house alone when he suddenly heard a faint noise, like it was coming from the basement. He stopped what he was doing and stared in the direction of the basement, standing silently. After a few seconds, he gently shook his head, seemingly convincing himself that it was just an illusion, but his fingers trembled slightly, and he didn't continue his actions. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

19. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<surprise, explicit>*

Lin Xue was organizing the documents on her desk when she suddenly heard a knock on the door. She froze for a moment, walked over to open it, and when she saw the person standing at the door,

her steps slightly hesitated. The person smiled at her, and her heart rate quickened a little, but she didn't speak immediately. Instead, she silently let him in. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

20. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<surprise, explicit>*

She walked into the café, ordered a latte, and as she was about to sit down, a familiar figure suddenly appeared in front of her. She looked up, froze for a moment, and the person smiled as they walked towards her. All words seemed to freeze in that instant. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

21. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<anger, explicit>*

He was about to drive, but realized that another car was parked too closely next to his, leaving almost no space to move. Standing beside the car, he paused for a few seconds, walked around his car, pressed his lips together, then looked down to inspect it. Finally, he stood in front of the car door, took a deep breath, and took out his phone to dial the parking lot management number. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

22. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<anger, explicit>*

Her pet knocked over a vase inside the house, and water and petals scattered everywhere. She stared at the broken pieces and water stains on the floor, momentarily speechless. Silently, she picked up the petals and wiped the floor, throughout the whole process not once looking at the pet. Her movements were gentle, but slightly stiff. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

23. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<disgust, explicit>*

Zhang Min walked into the kitchen and was immediately overwhelmed by the greasy smoke in the air, feeling a bit dizzy. In the pan was last night's burnt food that had been left on the stove, giving off a pungent smell. She pinched her nose, quickly turned off the fire, but couldn't help furrowing her brows. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

24. Please read the following story and select the primary emotion(s) you believed the protagonist experienced in the story. *<disgust, explicit>*

Standing in the crowded bus, Wang Mei couldn't help but step back a few paces. The dampness and musty smell in the carriage mixed together, making her feel uncomfortable. She raised her arm to cover her nose, but still couldn't avoid the unpleasant odor. [Multiple choice]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

【Questions - Section Ends】

Appendix 2: Questionnaire for Study 2

Welcome to this research.

【Demographics - Section Starts】

1. Please select your gender [Single choice]

○ Male

○ Female

2. Please select your age group [Single choice]

○ 0-20 years old

○ 21-30 years old

○ 31-40 years old

○ 41-50 years old

○ 51-60 years old

○ 60 years old and above

3. Please select your city [City]

【Red Herring - Section Starts】

What is 100 + 100? [Single choice]

○ 300

○ 500

○ 200

○ 600

【Red Herring - Section Ends】

Notes: After this section, participants were assigned to read 12 stories or news articles and answer corresponding questions. The order of the 12 stories or news articles and the 6 options for each

participant are randomized. The author marked each story or news article's pre-classified emotion in gray italics, which was not shown to human participants when answering the questions.

【Questions - Section Starts】

1. Please read the following news article / story and select the primary emotion(s) you experienced. <*happiness*>

On November 17, 2024, China's first deep-sea drilling vessel, "Dream," independently developed and designed by the 708th Research Institute and built by Huangpu Wenchong, was officially commissioned. This marks a significant breakthrough in China's deep-sea exploration key technology and equipment. The "Dream" drilling and sampling system is internationally advanced, with a maximum drilling depth of 11,000 meters. It features four drilling modes and three coring methods, and is expected to assist global scientists in achieving the scientific dream of "drilling through the Earth's crust and into the deep Earth." The vessel will provide significant support for China's deep-sea resource exploration, key technology equipment development, and global scientific research in ocean drilling. [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

2. Please read the following news article / story and select the primary emotion(s) you experienced. <*happiness*>

In the recently concluded 2025 UAE SWAT Challenge, the China Police B team, composed of Zhejiang Public Security SWAT officers, won the overall team championship. The China Police C team, made up of Anhui Public Security SWAT officers, secured the overall third place, while the China Police A team, consisting of special police units, placed 11th in the overall score. The China SWAT B team (Zhejiang team) stood out among 103 elite SWAT teams from 46 countries worldwide, showcasing remarkable willpower and exceptional skills, ultimately winning the

championship! This demonstrated the strength and spirit of China's SWAT teams to the world! [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

3. Please read the following news article / story and select the primary emotion(s) you experienced. *<sadness>*

Guo Jiaxuan, an 18-year-old rising star from Beijing Guoan FC, tragically suffered brain death after a head collision with an opposing player's knee during a friendly match in Spain. He has since been transferred to Beijing Tiantan Hospital for further care. Known for his exceptional football talent from a young age, Guo dreamed of leading the Chinese national team to the World Cup. As a standout player in Beijing Guoan's youth academy, he was selected for the U17 national men's team and earned a trial opportunity with Bayern Munich's World Squad... His future, once brimming with limitless potential, has been cut short by this devastating incident. [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

4. Please read the following news article / story and select the primary emotion(s) you experienced. *<sadness>*

On the morning of February 8, 2025, a landslide occurred in southwestern China's Sichuan Province, forcing hundreds of residents to evacuate. The authorities reported on the early morning of February 9 that at least 10 residential houses and one production building had been buried. Two injured individuals were rescued, and rescue teams continued searching for nearly 30 missing persons. As of 11 a.m. on February 9, authorities confirmed that one of the missing individuals had died, and 28 others remained unaccounted for. [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

5. Please read the following news article / story and select the primary emotion(s) you experienced. *<fear>*

On January 25th, a dismembered male body was found in an abandoned house in Yamanaka, Higashi-Osaka City. The neck, wrists, and feet had been severed. On February 5th, Osaka police revealed that the victim's head had been discovered in an abandoned apartment in the Chūō District of Osaka City, along with items that could possibly have been used to contain the head, such as a cooler bag. [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

6. Please read the following news article / story and select the primary emotion(s) you experienced. *<fear>*

In November 2023, on the streets of London, an elderly mother slowly pushed a wheelchair through the crowd. At first glance, this seemed like an ordinary scene, but those who came close were overwhelmed by a nauseating stench that made them dizzy. The police approached for questioning, only to uncover a shocking tragedy — the "passenger" in the wheelchair was a decayed corpse, and the owner of the body was none other than the elderly woman's own daughter! [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

7. Please read the following news article / story and select the primary emotion(s) you experienced. *<surprise>*

"Under heaven, there is no land that does not belong to the king, and on the borders of the land, there are no people who are not the king's subjects." Many people think this sentence means that all the land in the world belongs to the emperor, and all the people in the world are his subjects. In fact, the original meaning is quite the opposite. This sentence comes from Shi Jing, Bei Shan chapter. The original text is "P ǔ ti ā n zh ī xi à , m ò f ē i w á ng t ǔ ," which means that the land under heaven does not belong to the king, but the king is responsible for the people living on the land. [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

8. Please read the following news article / story and select the primary emotion(s) you experienced. *<surprise>*

In the 1970s, PepsiCo entered the Soviet Union, but the Soviet Union lacked international payment methods, and the ruble couldn't be used to pay in US dollars. Moscow could only exchange Pepsi for a famous brand of vodka, mixed in state-owned factories based on a formula designed by Russian chemist Dmitri Mendeleev. By the year before 1990, the first ten-year contract between Pepsi and the Soviet Union expired, and the new contract amount skyrocketed to $3 billion. However, the Soviet Union's "payment" in vodka was far from sufficient. As a result, the Soviet Union delivered 17 submarines, 1 destroyer, 1 frigate, and even a 13,000-ton cruiser to PepsiCo. Just the submarines alone were enough for PepsiCo to rank as the sixth-largest navy in the world. [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

9. Please read the following news article / story and select the primary emotion(s) you experienced. *<anger>*

On the afternoon of September 15, 2021, a video showing a violent law enforcement incident by the urban management team in the Xiaohai Street area of Nantong Economic Development Zone was widely circulated online. The video shows that at around 5 a.m. on September 15, after the urban management officers got out of the vehicle, they first seized the elderly vendor's balance scale from his mobile cart and placed it in the vehicle. The elderly man asked for it back, but he was lifted by the officers and then violently thrown to the ground, with the balance scale he was carrying also being broken by the officers. [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

10. Please read the following news article / story and select the primary emotion(s) you experienced. *<anger>*

"Chinese sanitary napkin giant" ABC faces a nationwide boycott. According to reports, many sanitary napkins on the market have been found to be "cutting corners," with actual lengths not matching the packaging labels. The discrepancy is even greater when measuring the inner absorbent layer for liquid absorption. As public opinion grew, brands such as Sofy, Whisper, Always, Keisa, and Space7 responded, all with sincere attitudes, except for ABC. ABC's customer service stated that a 1-2 cm discrepancy is normal, and "if you can't accept it, you don't have to buy." [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

11. Please read the following news article / story and select the primary emotion(s) you experienced. *<disgust>*

Zhao, who lives in Wanbailin, recently encountered an upsetting situation. He ordered the signature fried rice from a restaurant through a food delivery platform for 19.06 yuan, only to find a cockroach in the rice halfway through eating. [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

12. Please read the following news article / story and select the primary emotion(s) you experienced. *<disgust>*

A Red user posted: “Today, I checked into the Renaissance Hotel, completed the check-in process in the afternoon, and went out to explore. When I returned to the room in the evening, after washing up, I discovered a cockroach hanging next to the bathtub while I was in the bathroom. I almost lost it at that moment.” [Multiple choices]

☐ Happiness

☐ Sadness

☐ Fear

☐ Surprise

☐ Anger

☐ Disgust

【Questions - Section Ends】

Appendix 3: Questionnaire for Study 3

Welcome to this research.

【Red Herring - Section Starts】

This question is designed to assess the respondent's attentiveness. Please select "Very Dissatisfied." [Single Choice]

○ Very Dissatisfied

○ Dissatisfied

○ Satisfied

○ Very satisfied

【Red Herring - Section Ends】

【Demographics - Section Starts】

Please select your gender [Single choice]

○ Male

○ Female

Please select your city [City]

Please select your age group [Single choice]

○ 0-20 years old

○ 21-30 years old

○ 31-40 years old

○ 41-50 years old

○ 51-60 years old

○ 60 years old and above

【Demographics - Section Ends】

Notes: After this section, participants were randomly assigned to 12 different scenarios and choose the amount they were willing to allocate. Each scenario's participant emotion, participant emotion source, and perceived opponent emotion were explicitly stated in the questionnaire.

【Questions - Section Starts】

1. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Before starting the game, you were tasked with completing a puzzle within a 5-minute time limit. Initially, the puzzle seemed quite challenging, but Xiao Ming immediately stepped in with enthusiasm, offering key insights and methods for assembling the pieces. With his assistance, you finished the puzzle 30 seconds ahead of schedule. Seeing the puzzle completed successfully, B smiled warmly and said to you, "We worked together so well!" This naturally left you feeling deeply satisfied.

Therefore, Xiao Ming caused your emotion to be happiness, and you keenly sensed that Xiao Ming's emotion was also happiness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

2. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming had planned to have a meal together. During the meal, Xiao Ming mentioned that he had been going through some difficult times. His tone sounded low, and he sighed a few times. Although he was feeling sad, he narrated some details in a self-deprecating manner, even joking about himself with a humorous tone. This contrast made you laugh, bringing a sense of lightness and joy to your heart.

Therefore, Xiao Ming makes you feel happy, while you keenly perceived that Xiao Ming was feeling sad.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

3. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming ride a roller coaster together. As the ride starts, Xiao Ming looks extremely nervous, gripping the safety bar tightly and repeatedly asking you, “Is this safe?” Seeing him clearly scared yet trying to appear calm, you find it incredibly amusing and can’t help but laugh, feeling a wave of joy.

Therefore, Xiao Ming makes you feel happy, while you keenly perceive that Xiao Ming is feeling fear.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

4. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You are with Xiao Ming when he suddenly receives an unexpected gift. Seeing his surprised expression fills you with joy. You know he rarely experiences such surprises, and his shocked reaction makes you laugh, instantly lifting your mood.

Therefore, Xiao Ming makes you feel happy, while you keenly perceive that Xiao Ming is feeling surprised.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

5. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming are playing a game together, but he loses a round due to an operational mistake. Frustrated, he slams the keyboard and keeps complaining about the game being unfair. The angrier he gets, the more exaggerated his reaction seems to you, making you laugh and feel a lighthearted sense of joy.

Therefore, Xiao Ming makes you feel happy, while you keenly perceive that Xiao Ming is feeling angry.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

6. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Today, you and Xiao Ming decide to try a new restaurant. However, when the main dish arrives, its smell makes Xiao Ming frown and even lean back slightly. He keeps whispering about how strange the dish smells. Watching his reluctant yet disgusted expression, you find it incredibly amusing and can’t help but laugh, feeling lighthearted and happy.

Therefore, Xiao Ming makes you feel happy, while you keenly perceive that Xiao Ming is feeling disgusted.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

7. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

While taking a walk in a park near your home, you unexpectedly come across a breathtaking sea of flowers. The sunlight casts a warm glow over the vibrant blossoms, and the stunning scenery lifts your mood. When you return home, you find Xiao Ming watching his favorite comedy movie, laughing heartily from time to time. He is clearly amused by the film, and you, still feeling joyful from the beautiful sight earlier, remain in high spirits.

As a result, an external event makes you feel happy, and you keenly perceive that Xiao Ming is also feeling happy.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

8. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You just received an email informing you that you unexpectedly won a competition, with a prize large enough to fund a long-awaited trip. This exciting news fills you with joy and puts you in a relaxed mood. However, as soon as Xiao Ming walks in, he looks downcast and tells you that his pet is sick and needs to see a vet. He appears very sad and even a bit overwhelmed, while your happiness from the good news remains.

As a result, an external event makes you feel happy, and you keenly perceive that Xiao Ming is feeling sad.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

9. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You attended an outdoor community concert, where the live band gave an incredible performance, and the crowd was full of energy. The vibrant atmosphere made you feel completely relaxed and happy. When you returned home, you found Xiao Ming preparing for a speech. He looked nervous, constantly adjusting his script, and even had a bit of cold sweat. Despite his obvious fear, your mood remained joyful from the concert experience.

As a result, an external event makes you feel happy, and you keenly perceive that Xiao Ming is feeling fearful.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

10. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

During your morning run, you unexpectedly ran into an old friend you hadn't seen in a long time. The two of you reminisced about past memories, and the joy of reunion kept you in a great mood all day. Meanwhile, Xiao Ming received an unexpected package. As he unwrapped it, his face was filled with surprise, muttering, "Who would send me this?" Although his emotion was surprise, it did not affect your cheerful mood.

As a result, an external event makes you feel happy, and you keenly perceive that Xiao Ming is feeling surprised.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100

Amount you are willing to allocate to Xiao Ming	

11. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You attended a comedy show, and the performers' brilliant acts made you laugh so hard that your stomach hurt. The performance brought you immense joy. When you got home, you found Xiao Ming sitting at the table with an angry expression. He was filling out a form but discovered that some crucial information couldn't be entered. His complaints kept coming, but you were still immersed in the happiness brought by the show.

As a result, an external event makes you feel happy, and you keenly perceive that Xiao Ming is feeling angry.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

12. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You participated in a baking competition and made a perfect cake. Not only did you win a prize, but you also received praise from the judges. All of this made you feel extremely happy. When

you got home, you found Xiao Ming dealing with the garbage in the kitchen. He was frowning and continuously complaining, “This smell is so disgusting.” Despite Xiao Ming’s expression filled with disgust, your mood remained upbeat because of the success in the competition.

As a result, an external event makes you feel happy, and you keenly perceive that Xiao Ming is feeling disgust.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

13. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming comes running towards you with a big smile, excitedly telling you that he’s about to go to another place to pursue a new opportunity, which is a significant breakthrough for him. He speaks with great enthusiasm but completely fails to notice the sadness and reluctance you feel inside. You really want to be happy for him, but the thought of him leaving fills you with deep sadness.

As a result, Xiao Ming causes you to feel sadness, and you keenly perceive that Xiao Ming is feeling happiness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

14. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming looks down, filled with regret, and tells you that he accidentally lost the precious item you lent him. His tone is full of self-blame, but this item means a lot to you, and losing it makes you feel deeply sad. While Xiao Ming is also upset about it, your sadness feels more like an irreplaceable sense of loss.

As a result, Xiao Ming causes you to feel sadness, and you keenly perceive that Xiao Ming is also feeling sadness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

15. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming hurriedly tells you that during a recent conflict, he accidentally said some hurtful things to you. He looks anxious, seemingly afraid of your reaction. However, those words have caused you deep pain, and you can't help but remember the sting they left, filling your heart with sadness.

As a result, Xiao Ming causes you to feel sadness, and you keenly perceive that Xiao Ming is feeling fear.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

16. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming accidentally mentions that he just realized you missed an important opportunity, one that could have completely changed your current situation. He seems a bit surprised and keeps repeating, "I thought you knew about it!" Although he doesn't mean any harm, this news cuts deep, and you are overwhelmed with regret and sadness.

As a result, Xiao Ming causes you to feel sadness, and you keenly perceive that Xiao Ming is feeling surprise.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

17. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming gets very angry with you over a small issue. His tone is full of impatience and blame, completely disregarding your feelings. His anger makes you feel helpless and wronged, and sadness gradually spreads in your heart. Meanwhile, he seems to be completely immersed in his own emotions, not noticing your pain at all.

As a result, Xiao Ming causes you to feel sadness, and you keenly perceive that Xiao Ming is feeling anger.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

18. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming says with a tone of disdain that he absolutely doesn't like the gift you carefully prepared for him. Without thinking, he directly states, "I can't use this, it's meaningless." Although he may not have intended any harm, his words deeply hurt you, making you feel that your thoughtful gesture has been dismissed, and sadness overwhelms you.

As a result, Xiao Ming causes you to feel sadness, and you keenly perceive that Xiao Ming is feeling disgust.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

19. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You see a news report about a natural disaster, where many families have lost their homes. The images deeply move you, and you feel an overwhelming sense of sadness. At the same time, Xiao Ming is listening to his favorite music, dancing playfully to the rhythm with a big smile on his face. He is clearly immersed in his own happiness, while your sadness lingers in your heart.

As a result, an external event caused you to feel sadness, and you keenly perceive that Xiao Ming is feeling happiness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

20. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You receive a message from a distant relative, informing you that an elder in your family is seriously ill. This news weighs heavily on your heart, and you can't help but sigh. Meanwhile, Xiao Ming is sitting on the couch, head down, complaining about the difficulties he's been facing at work. His expression also appears gloomy, while your emotions remain affected by the external news.

As a result, an external event caused you to feel sadness, and you keenly perceive that Xiao Ming is also feeling sadness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

21. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You see an injured little animal on the side of the road, and its helpless appearance breaks your heart, causing you to feel deeply saddened. When you return home, you find Xiao Ming is afraid of a thunderstorm outside. He tightly pulls the curtains, muttering, “The thunder is so loud, could something happen?” Despite Xiao Ming’s fear, your sadness still lingers over you.

As a result, an external event caused you to feel sadness, and you keenly perceive that Xiao Ming is feeling fear.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

22. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Today, you open your calendar and suddenly remember that it is the birthday of a deceased loved one. This memory fills you with a deep sense of sadness that lingers in your heart. Meanwhile, Xiao Ming suddenly notices that the plant on his table has bloomed. He excitedly shouts, “Look, it actually bloomed!” Although he seems very surprised, your emotions are still clouded by sadness.

As a result, an external event caused you to feel sadness, and you keenly perceive that Xiao Ming is feeling surprise.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

23. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You learn that a friend who once helped you has been laid off, and you feel deeply regretful and saddened by this news. This information leaves you feeling downcast, making it difficult to focus on other things. Meanwhile, Xiao Ming is angry because the items he ordered online have been delayed. He is on the phone, speaking harshly and demanding that customer service resolve the issue quickly. Although his anger is obvious, your sadness continues to linger in your heart.

As a result, an external event caused you to feel sadness, and you keenly perceive that Xiao Ming is feeling anger.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

24. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You read a heartbreaking story online about a child who lost the opportunity to attend school due to family issues. This story deeply moved you, and your emotions became very low. Meanwhile, Xiao Ming is in the kitchen trying to cook a new dish, but the smell of the ingredients makes him wrinkle his nose, and he quickly tosses it in the trash. He complains with distaste, “This dish really smells awful!” Despite his reaction, your sadness from the story remains with you.

As a result, an external event caused you to feel sadness, and you keenly perceive that Xiao Ming is feeling disgust.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

25. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming excitedly invites you to watch his favorite horror movie. He laughs throughout the movie and occasionally mocks the characters, while you are frightened by the terrifying scenes, your palms sweating, heart racing, and you can’t even look directly at the screen. The contrast between Xiao Ming’s excitement and your fear is striking.

As a result, Xiao Ming causes you to feel fear, and you keenly perceive that Xiao Ming's emotion is happiness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

26. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming quietly tells you that one of his close friends recently had an accident, and the cause of the incident is still unclear. He chokes up as he speaks, his eyes filled with sadness. "Before the accident, he said he had been feeling like someone was following him." Xiao Ming's voice carries suppressed pain, but his story makes you feel a tightness in your chest, as you start to worry whether something similar could happen to you. The shadow of fear gradually overtakes your mind.

As a result, Xiao Ming causes you to feel fear, and you keenly perceive that Xiao Ming's emotion is sadness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100

Amount you are willing to allocate to Xiao Ming	

27. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming rushes over, his face pale as he tells you that he just heard some strange sounds, like whispering voices coming from next door. His description is full of details, and the more he talks, the more uneasy you feel. Xiao Ming's fear is contagious, and you unconsciously start looking around, trying to spot any signs of something abnormal.

As a result, Xiao Ming causes you to feel fear, and you keenly perceive that Xiao Ming's emotion is also fear.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

28. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming's eyes widen in surprise as he says, "I just saw a figure outside the window, but when I looked back, it was already gone!" He points towards the window, his face full of disbelief. You look in the direction he's pointing, but all you see is the pitch-black night. His surprised reaction

makes your heart race, and your mind starts imagining all kinds of potential dangers, fear flooding over you like a wave.

As a result, Xiao Ming causes you to feel fear, and you keenly perceive that Xiao Ming's emotion is surprise.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

29. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming angrily questions you about whether you've touched one of his personal items. His tone is harsh, even making you feel somewhat pressured. Although you're sure you haven't done anything wrong, his intense reaction makes you feel afraid, and you start to doubt whether you've unknowingly made a mistake.

As a result, Xiao Ming causes you to feel fear, and you keenly perceive that Xiao Ming's emotion is anger.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

30. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming looks at a huge spider that just appeared in the house with disgust, immediately asking you to take care of it. You're already afraid of spiders, but Xiao Ming's impatient tone as he urges, "Hurry up and get rid of it, it's so disgusting!" makes you feel even more nervous. His reaction amplifies your fear, and you become even more terrified, unsure of what to do.

As a result, Xiao Ming causes you to feel fear, and you keenly perceive that Xiao Ming's emotion is disgust.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

31. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

In the evening, you find out from the news that a robbery occurred nearby, just a few streets away from your house. This sends a chill down your spine, and you can't help but repeatedly check if all the doors and windows are locked. Meanwhile, Xiao Ming is in the living room, laughing heartily as he's engrossed in a comedy variety show.

As a result, an external event caused you to feel fear, while you keenly perceive that Xiao Ming's emotion is happiness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

32. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You come across a shocking post on social media: someone describes suspicious individuals being spotted frequently in your neighborhood. The post includes some blurry photos, which make you feel incredibly anxious. Meanwhile, Xiao Ming is sitting on the couch, sighing as he scrolls through his phone. He just found out that his favorite singer is taking a break from the stage due to health issues, and his face is full of sadness.

As a result, an external event caused you to feel fear, while you keenly perceive that Xiao Ming's emotion is sadness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

33. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Late at night, you hear strange footsteps and whispers outside your window, as if someone is wandering near your house. You're so tense that you don't dare move a muscle, holding your breath. Meanwhile, Xiao Ming also looks terrified. He walks out of his room, stammering and asking, "Did you hear that sound? Is there someone out there?"

As a result, an external event caused you to feel fear, and you keenly perceive that Xiao Ming's emotion is also fear.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

34. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You suddenly receive an urgent notice informing the residents of your neighborhood about several recent incidents of vehicle vandalism, advising everyone not to go out alone. This makes you feel uneasy, and there seems to be a chill outside. However, Xiao Ming stands by the window, looking amazed, and shouts, “Quick, look! There’s a shooting star!”

As a result, an external event caused you to feel fear, and you keenly perceive that Xiao Ming’s emotion is surprise.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

35. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You see a notice on the bulletin board at the entrance of your neighborhood, warning about an assault that recently occurred nearby and advising everyone to be extra cautious. This sends a chill down your spine, and you hurry back home. Meanwhile, Xiao Ming is sitting at home, angrily arguing with a delivery person. His package was damaged, and he’s in the middle of a heated discussion about it.

As a result, an external event caused you to feel fear, and you keenly perceive that Xiao Ming's emotion is anger.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

36. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

A news report covers a bizarre disappearance at a forest park, where the police are searching for a missing tourist. The thought that you've been to that park sends a chill down your spine, and your mind fills with all sorts of frightening images. Meanwhile, Xiao Ming walks into the kitchen with a frown, complaining in disgust, "This dish has gone bad, it smells awful!" His attention is focused on the food.

As a result, an external event caused you to feel fear, and you keenly perceive that Xiao Ming's emotion is disgust.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100

Amount you are willing to allocate to Xiao Ming	

37. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.。

Before the game begins, something happens:

Xiao Ming suddenly hands you a box with a big smile, saying mysteriously, “Open it and see!” Curious, you unwrap the box and find a painting he made himself. The painting depicts a scene from a trip you two took together. You’re surprised by his artistic skill and thoughtfulness, while he looks at your expression with a proud smile.

As a result, Xiao Ming causes you to feel surprise, and you keenly perceive that Xiao Ming’s emotion is happiness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

38. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming walks into the room with a faint look of sadness on his face. He softly says to you, “Actually, I’ve been hiding this from you. I had an interview, and I just found out... I didn’t make

it to the next round." You stare at him in disbelief, shocked that he managed to find time for the interview, while Xiao Ming lets out a bitter laugh and sighs, looking a bit regretful.

As a result, Xiao Ming causes you to feel surprise, and you keenly perceive that Xiao Ming's emotion is sadness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

39. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming, his face pale, trembles as he says, "I... I just heard a strange noise behind the wall, and then I went to check and found..." He nervously holds up his phone to show you a video. In the video, you can barely make out the shadow of an animal flashing by. You feel a bit surprised but not scared as you watch the video, while Xiao Ming whispers, "Should we call the police?"

As a result, Xiao Ming causes you to feel surprise, and you keenly perceive that Xiao Ming's emotion is fear.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

40. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming bursts into the room, his face full of surprise, shouting, “You will never believe what I just found on the balcony!” He holds up an old photograph, and to your shock, it’s a childhood picture of you, with handwriting on the back that matches your own from when you were younger. You stare at the photo, stunned, unsure how it suddenly appeared here.

As a result, Xiao Ming causes your emotion to be surprise, and you keenly perceive that Xiao Ming’s emotion is also surprise.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

41. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming slams his hand on the table, angrily pointing at a contract and saying, “Do you know what this is? It’s the contract that the company messed up before! They actually tried to back out!” You take a glance at the contract and realize that Xiao Ming, with his own efforts, has managed to get the company to compensate a large sum of money. You can’t help but feel astonished by his decisiveness and courage, while Xiao Ming continues to vent his anger at the company’s unreliability.

As a result, Xiao Ming causes your emotion to be surprise, and you keenly perceive that Xiao Ming’s emotion is anger.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

42. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming stands in the kitchen, frowning as he opens the refrigerator: “Look at this!” He points at a box of frozen food in the corner and says, “How long has this been expired!” You take a closer look and realize that this box of food is a sample of a new product you bought on a whim. Xiao Ming, with a disgusted expression, throws it into the trash.

As a result, Xiao Ming causes your emotion to be surprise, and you keenly perceive that Xiao Ming’s emotion is disgust.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

43. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You are browsing social media when suddenly you come across a news headline: “The world’s oldest person has passed away at the age of 150.” You are so surprised that you can hardly believe it, and quickly click on the article to learn more details. Meanwhile, Xiao Ming is sitting on the sofa watching his favorite comedy show, laughing uncontrollably.

As a result, an external event caused your emotion to be surprise, and you keenly perceive that Xiao Ming’s emotion is happiness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

44. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You are browsing social media when suddenly you come across a news headline: “The world’s oldest person has passed away at the age of 150.” You are so surprised that you can hardly believe it, and quickly click on the article to learn more details. Just then, Xiao Ming walks over, head down, with a heavy expression on his face. He has just learned that one of his pets suddenly became ill, and his mood is very down.

As a result, an external event caused your emotion to be surprise, and you keenly perceive that Xiao Ming’s emotion is sadness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

45. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You just saw a report on the news saying that an old building in the city center, very close to your home, is about to collapse. You are immediately shocked and decide to contact your friends to confirm the situation. Upon hearing this, Xiao Ming’s face turns pale, as though it has triggered some terrifying memories.

As a result, an external event caused your emotion to be surprise, and you keenly perceive that Xiao Ming's emotion is fear.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

46. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You just learned about a new discovery where scientists found an entirely new species in Antarctica — a bird-like creature that resembles a dinosaur. This news fills you with surprise and curiosity about the wonders of nature. At that moment, Xiao Ming suddenly shouts, "Did you see this news too? I just saw it!" His face is also full of surprise, and it seems he shares the same feeling as you.

As a result, an external event caused your emotion to be surprise, and you keenly perceive that Xiao Ming's emotion is also surprise.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100

Amount you are willing to allocate to Xiao Ming	

47. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You read a news report about a large company being publicly criticized for environmental issues. The CEO of the company, during an interview, appeared unrepentant and even defended the company's actions. This left you shocked, unable to believe that a company could so blatantly disregard environmental protection. Meanwhile, Xiao Ming, upon hearing the news, angrily threw the remote control aside, criticizing those irresponsible companies, showing intense outrage.

As a result, an external event caused your emotion to be surprise, and you keenly perceive that Xiao Ming's emotion is anger.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

48. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You read a news article about unethical businesses using false advertising to sell poor-quality products, some of which even pose health risks to consumers. This leaves you shocked, and the

news weighs heavily on your mind. Meanwhile, Xiao Ming, sitting beside you, frowns at the screen and expresses his displeasure, saying, “This is just disgusting. I don’t want to hear about these people’s wrongdoings anymore!”

As a result, an external event caused your emotion to be surprise, and you keenly perceive that Xiao Ming’s emotion is disgust.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

49. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You’re focused on your work when suddenly Xiao Ming plays his favorite music loudly right next to you, completely disturbing your concentration. You try to endure it, but you’re getting more and more irritated. Finally, you can’t hold it in anymore and shout, “Can you turn down the volume? I’m working!” However, Xiao Ming remains completely unaware of your frustration, happily humming along to the music, completely oblivious to your feelings.

As a result, Xiao Ming causes your emotion to be anger, and you keenly perceive that Xiao Ming’s emotion is happiness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

50. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming suddenly tells you that he has lost an important document and hasn't taken any steps to retrieve it. You feel extremely angry, thinking to yourself, "If he had been more careful, this wouldn't have happened!" You try to explain the importance of the matter to him, but Xiao Ming looks down, his voice soft and dejected, saying he feels a bit down and just can't face it.

As a result, Xiao Ming causes your emotion to be anger, and you keenly perceive that Xiao Ming's emotion is sadness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

51. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming are shopping at the supermarket, and you accidentally knock over some items on a shelf. Xiao Ming sees this and suddenly reacts with extreme fear, saying, “Oh my God, we need to leave quickly! If we get caught, we’ll have to pay for it!” You think his reaction is over the top—it’s just a small accident, yet he’s making such a big deal out of it. You angrily say, “Can’t you just stay calm? It’s really not a big deal.”

As a result, Xiao Ming causes your emotion to be anger, and you keenly perceive that Xiao Ming’s emotion is fear.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

52. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You’re waiting for Xiao Ming in the park, and he’s almost an hour late. When he finally arrives, he looks surprised and says, “Oh, I didn’t expect you to still be here. I thought you would have left by now!” This makes you very angry because you’ve been waiting in the hot weather for a long time. You tell him, “You didn’t even notify me in advance, and you’re still so calm about it!”

As a result, Xiao Ming causes your emotion to be anger, and you keenly perceive that Xiao Ming’s emotion is surprise.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

53. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming are working together to solve a problem, but suddenly he becomes impatient and starts yelling at you, saying, “This isn’t even my responsibility! Why am I always dragged into this?” His emotional outburst makes you angry because you’ve been trying to cooperate, but Xiao Ming not only fails to appreciate your efforts, but also blames you. You snap back angrily, saying, “If you always shirk responsibility, how can we work together?”

As a result, Xiao Ming causes your emotion to be anger, and you keenly perceive that Xiao Ming’s emotion is also anger.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

54. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

Xiao Ming just came back from outside, looking visibly displeased and disgusted. He tells you that he saw some people in the store that he really dislikes and even insulted them in his mind. You feel uncomfortable with his attitude and can't help but remind him, "You shouldn't treat others like that; after all, everyone has their own struggles." However, Xiao Ming dismisses your advice and continues with his attitude, thinking that you're meddling. His indifference makes you furious.

As a result, Xiao Ming causes your emotion to be anger, and you keenly perceive that Xiao Ming's emotion is disgust.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

55. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You're walking down the street when you come across a news article about a large corporation that faced a minor fine for environmental violations, while their CEO still received a massive bonus. This makes you incredibly angry, as you can't stand such unfair treatment. Just then, Xiao

Ming turns to you with a smile and says, “I found a new restaurant today, and the food is amazing! Let’s go try it out!”

As a result, an external event caused your emotion to be anger, and you keenly perceive that Xiao Ming’s emotion is happiness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

56. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You just received an email informing you that a charity project you’ve been supporting has been forced to discontinue due to financial issues, causing many people to lose opportunities. You feel both anger and frustration, thinking how unfair the world is. Xiao Ming notices your silence and softly says, “I’ve been feeling a bit sad lately, there are some issues at home.” While you understand Xiao Ming’s emotions, your own anger is hard to calm.

As a result, an external event caused your emotion to be anger, and you keenly perceive that Xiao Ming’s emotion is sadness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

57. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

On your way home, you hear a news story about an innocent citizen being unjustly treated due to a police mistake. This fills you with intense anger, feeling deeply upset by the social injustice. Xiao Ming, noticing the anger on your face, suddenly seems a bit scared. He carefully asks, “You look really angry, is something wrong?” Instinctively, you respond, “The world is so unfair!” Meanwhile, Xiao Ming nervously hugs himself, as though fearing you might do something extreme because of your anger.

As a result, an external event caused your emotion to be anger, and you keenly perceive that Xiao Ming’s emotion is fear.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

58. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You return home and see a report on social media about large companies intentionally cutting employee benefits to save costs, while their top executives continue to live luxuriously. This fills you with anger, feeling that it is extremely unethical. You can't help but share this news with Xiao Ming, but he looks very surprised and says, "Wow, is that really happening? I thought everyone was focusing on employee benefits nowadays."

As a result, an external event caused your emotion to be anger, and you keenly perceive that Xiao Ming's emotion is surprise.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

59. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You witness an unfair incident on the bus: an elderly person is shoved by others while getting on the bus, and the people around simply ignore it. You feel very angry, thinking that this kind of indifference is extremely disappointing. Xiao Ming notices your expression, and his face also becomes filled with anger as he loudly exclaims, "This is outrageous! How can society be so heartless nowadays?"

As a result, an external event caused your emotion to be anger, and you keenly perceive that Xiao Ming's emotion is also anger.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

60. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You see a news report stating that a company is forcing its employees to work overtime in order to increase stock prices, completely ignoring their health and family life. This makes you extremely angry, and your mood becomes very upset. You decide to confide in Xiao Ming about it, but he seems uninterested in the topic. He furrows his brow and says, “I really don’t want to hear any more of this negative news. We can’t change it anyway.”

As a result, an external event caused your emotion to be anger, and you keenly perceive that Xiao Ming’s emotion is disgust.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

61. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming attend a friend's party, and everyone is having a great time. However, when Xiao Ming picks up the microphone and starts telling jokes, you suddenly feel disgusted. He begins making fun of other friends' appearances and clothing, and you feel that his words are extremely rude and disrespectful. Even though everyone around is laughing, Xiao Ming is still smiling, seemingly unaware that his words are making you uncomfortable. You furrow your brows, wanting to leave the situation as soon as possible.

As a result, Xiao Ming causes your emotion to be disgust, and you keenly perceive that Xiao Ming's emotion is happiness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

62. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You see a comment posted by Xiao Ming on his social media, and it's deeply unsettling. He wrote, "Some people deserve to fail." This comment makes you feel very disgusted. Although you understand that Xiao Ming is feeling sad, you can't accept such a cold and aggressive statement.

You silently turn away, unsure of how to respond, while Xiao Ming still looks somewhat down, seemingly unaware of how his comment has affected you.

As a result, Xiao Ming causes your emotion to be disgust, and you keenly perceive that Xiao Ming's emotion is sadness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

63. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming are walking down the street when Xiao Ming suddenly spots a dog. He starts screaming loudly and overreacting, saying, "It will attack me!" You feel a bit uncomfortable because his reaction seems exaggerated and you feel like he's dragging you down. You try to stay calm, but inside you feel somewhat annoyed, thinking that Xiao Ming doesn't need to be this afraid. Meanwhile, Xiao Ming is still trembling.

As a result, Xiao Ming causes your emotion to be disgust, and you keenly perceive that Xiao Ming's emotion is fear.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

64. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

While you are eating together, Xiao Ming suddenly brings up topics you never wanted to discuss, like other people's private matters and gossip. He says with a surprised expression, "Don't you think their lives are interesting?" You find the conversation highly inappropriate, and it makes you feel very disgusted.

As a result, Xiao Ming causes your emotion to be disgust, and you keenly perceive that Xiao Ming's emotion is surprise.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

65. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming attend a discussion meeting. During the discussion, Xiao Ming suddenly expresses some extreme views. He keeps interrupting others and expresses his opinions in a very radical manner. You feel a great deal of disgust because his attitude is disrespectful to others and makes the atmosphere tense. Even though he angrily defends himself, you can no longer tolerate his unreasonable behavior, and your mood becomes heavier.

As a result, Xiao Ming causes your emotion to be disgust, and you keenly perceive that Xiao Ming's emotion is anger.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

66. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming are watching a movie in the theater, but throughout the movie, Xiao Ming keeps expressing his dissatisfaction. Whenever the plot reaches a point he doesn't like, he makes disapproving sounds and even mutters a few words. This makes you feel a strong sense of disgust because you think he is showing no respect for the other viewers. Although his face clearly shows his own feeling of disgust, you still feel very uncomfortable and wish for the movie to end soon.

As a result, Xiao Ming causes your emotion to be disgust, and you keenly perceive that Xiao Ming's emotion is also disgust.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

67. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming are shopping in a busy market in the city center. Suddenly, a garbage truck passes by, carrying bags full of garbage soaked in sewage, emitting a strong and unpleasant smell. You wrinkle your nose in disgust, wanting to quickly leave the area. Meanwhile, Xiao Ming notices a street performer dressed as a clown, and he becomes very happy, laughing out loud at the clown's comedic movements. You, however, just want to leave, not wanting to stay in the area any longer.

As a result, an external event caused your emotion to be disgust, and you keenly perceive that Xiao Ming's emotion is happiness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

68. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming go to a restaurant to eat, but the restaurant's cleanliness makes you feel very uncomfortable. There are food crumbs on the floor, and the table has oil stains that haven't been cleaned. You feel a strong sense of disgust and find the environment unbearable. Meanwhile, Xiao Ming appears sad; he has just received some bad news from a friend and doesn't notice your dissatisfaction with the restaurant's cleanliness.

As a result, an external event caused your emotion to be disgust, and you keenly perceive that Xiao Ming's emotion is sadness.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

69. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming are shopping when you suddenly hear a heated argument on the street. The people involved are shouting aggressively, and the air is filled with insults. This sudden outburst makes you feel extremely uncomfortable, and a sense of disgust rises within you. You quickly pull Xiao Ming away, wanting to leave the area as soon as possible. However, Xiao Ming appears

frightened by the situation—his face tense, and his body slightly trembling as if afraid that someone might suddenly lash out.

As a result, an external event caused your emotion to be disgust, and you keenly perceive that Xiao Ming's emotion is fear.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

70. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

While visiting a museum, you suddenly notice a group of tourists nearby talking loudly, taking photos despite the no-photography signs, and completely ignoring the museum's rules. A strong sense of disgust rises within you as you feel they are showing no respect for this cultural space. Xiao Ming notices your displeasure, looks around at the noisy tourists, and his face shows clear surprise—he didn't expect visitors to behave so rudely.

As a result, an external event caused your emotion to be disgust, and you keenly perceive that Xiao Ming's emotion is surprise.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

71. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

As you sit in a café, you notice a group of people in the corner having a loud and heated discussion about sensitive topics. Their argument grows more intense, filled with aggressive language, which makes you feel deeply disgusted. Your mood becomes heavy, and you try to ignore them. However, Xiao Ming also notices their dispute and angrily exclaims, “How can they be so unreasonable?” Clearly, he is infuriated by the tense atmosphere.

As a result, an external event caused your emotion to be disgust, and you keenly perceive that Xiao Ming’s emotion is anger.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

72. Today, you will play a game with Xiao Ming.

You have been given a sum of virtual money (100 yuan), and you need to decide how to allocate this money between you and Xiao Ming. You have full control over the final allocation, and Xiao Ming can only accept the allocation you make.

Before the game begins, something happens:

You and Xiao Ming are watching a street performance, but the performers' actions make you uncomfortable. They deliberately engage in extreme and disrespectful behavior, even making crude and offensive jokes. You feel that this performance lacks any artistic value and is merely seeking attention, which fills you with disgust. Xiao Ming also shows a look of disdain—it's clear that he dislikes the performance as well. Both of you find the show highly inappropriate.

As a result, an external event caused your emotion to be disgust, and you keenly perceive that Xiao Ming's emotion is also disgust.

Now, you will begin the game with Xiao Ming.

Please note: Aside from the conditions mentioned above, do not let any other factors influence your decision!

Are you ready? Start making your allocation! [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

【Questions - Section Ends】

【Baseline - Section Starts】

If you had no emotions before the game and did not perceive any emotions from Xiao Ming, how much money would you allocate to Xiao Ming? [Slider]

	0 - 100
Amount you are willing to allocate to Xiao Ming	

【Baseline - Section Ends】

Appendix 4: Questionnaire for Study 4

Today, there are 4 customers seeking your help. Please note that their demands may not be very reasonable, and their tone might not be ideal. However, you should always maintain a good service attitude to address their needs, and do not let one customer's emotions affect the service you provide to the next customer. The customer's requests will be presented in the form of questions, with three possible replies. Please choose the reply you think is most appropriate.

Note: For e-commerce customer service, a good service attitude, professional quality, and problem-solving ability are crucial. However, your team values good service attitude and friendly communication the most, so we hope you can fully demonstrate these qualities in today's service.

【Demographics - Section Starts】

Please select your gender [Single choice]

○ Male

○ Female

Please select your age group [Single choice]

○ 0-20 years old

○ 21-30 years old

○ 31-40 years old

○ 41-50 years old

○ 51-60 years old

○ 60 years old and above

Please select your city [City]

【Demographics - Section Ends】

【Red Herring - Section Starts】

This question is designed to assess the respondent's attentiveness. Please select 1. [Scale]

[Extremely unlikely, Extremely likely]

○ 1 ○2 ○3 ○4 ○5 ○6 ○7

【Red Herring - Section Ends】

Notes: After this section, participants were evenly assigned to one of three groups: positive, neutral, or negative, where each group was presented with customer inquiries that varied in emotional tone and attitude.

【Scenario 1 (positive group) - Section Starts】

1. Customer 1 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

2. Hello! I found that I have a voucher that is still valid, but I forgot to use it on my last order. I would like to ask if it's possible to use this voucher for a refund? Thank you very much for your help! [Single choice]

○ I sincerely apologize! Vouchers generally cannot be used for refunds. If you accidentally missed using it, I recommend using it on your next order. Thank you very much for your understanding and support!

○ I'm very sorry, but vouchers typically cannot be used for refunds. If you missed using it, I suggest you use it on your next order. Thank you for your understanding!

○ Apologies, vouchers usually cannot be used for refunds. If you missed using it, you can use it on your next order. Thank you for your understanding!

3. I remember it was possible before, why can't it be done this time? Could you please help me confirm? Thank you very much! [Single choice]

○ I sincerely apologize for the inconvenience! The previous situation was indeed different. I will help you apply for special handling from the leadership, but it may take some time. Thank you for your patience and understanding!

○ I’m very sorry, the previous situation was indeed different. I will apply for special handling from the leadership for you, but it may take some time. Thank you for your patience and understanding!

○ Apologies for the inconvenience. Our policy is different now compared to before. I will try to apply for special handling from the leadership, but it may take some time. Please be patient!

4. I really like your products, but this experience has been a bit disappointing. I still hope you can help me resolve it as soon as possible. [Single choice]

○ I’m truly sorry to have disappointed you! I will expedite the special approval process for you. Please be patient for a little longer. Your support means a lot to us!

○ I’m very sorry for disappointing you! I will apply for special approval as soon as possible. Please wait a moment.

○ Sorry to disappoint you! I will process it as quickly as possible and apply for special approval. Please wait a little longer.

5. The service for Customer 1 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

6. Please assess Customer 1’s communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5 ○6 ○7

7. Customer 2 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

8. Hello, I received the product but noticed some issues. Could you please help me resolve this? Thank you! [Single choice]

○ We sincerely apologize! Could you please let us know what the issue is? You can briefly describe it or take a photo, and we will address it promptly to ensure your satisfaction.

○ We apologize. Could you please specify the issue? Kindly describe it or provide relevant images, and we will assist you as soon as possible.

○ Hello, could you please let us know what the specific issue is? You can briefly describe it or take a photo, and we will follow up to resolve it.

9. The item I received is visibly damaged, and I would like to request a return. Please help me process it, thank you! [Single choice]

○ We sincerely apologize! Please submit a return request on the platform and upload photos as proof. We will verify and process it as soon as possible. Thank you for your understanding and support!

○ We are very sorry! You can submit a return request on the platform and upload photos of the damage as proof. We will process it as soon as possible. Thank you for your understanding and cooperation

○ If the item is indeed damaged, you may request a return. Please submit a return request on the platform and upload photos of the damage as proof. We will verify and process it as soon as possible

10. Could you please help me process the return? Thank you! [Single choice]

○ We sincerely apologize for the issue! Don’t worry, I will register the problem for you and assist you throughout the return process

○ Sorry for the inconvenience. I will register your case, and you only need to follow the system prompts to complete the return process

○ Alright, please follow the system prompts to complete the return process

11． The service for Customer 2 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

12. Please assess Customer 2's communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

13. Customer 3 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

14. Hello, my order status shows it was shipped last week, but there haven't been any updates on the tracking information since then. Could you please check for me? Thank you so much! [Single choice]

○ I will check the logistics details for you right away. Please hold on.

○ Let me look into it. Please wait a moment.

○ I'll check it now.

15. Is it that the warehouse hasn't actually shipped the order, or is it just a delay in the courier's tracking update? [Single choice]

○ I've checked for you, and the order was shipped on time. The courier company may not have updated the tracking information yet.

○ The warehouse records show that the order has been shipped. It's possible that the courier hasn't updated the tracking details.

○ The warehouse confirms that your order was shipped on time, so it should be an issue with the courier.

16. Perhaps you could cooperate with SF Express, which might help improve the user experience. [Single choice]

○ We sincerely apologize! Our partnered courier services are arranged by the company. If there are any adjustments in the future, we will definitely prioritize your suggestion! Thank you for your understanding and support!

○ Sorry, our courier service is uniformly arranged by the company, and we currently have no other options. We also have no control over it. Thank you for your understanding.

○ Apologies, our default courier service is company-arranged, and there are no other choices at the moment. If you wish to use SF Express, you may select the express service option for an additional 30 yuan when placing an order.

17. The service for Customer 3 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

18. Please assess Customer 3's communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

19. Customer 4 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

20. Hello, I noticed the price of the item I bought has dropped. I was wondering if I can get a price difference refund. Thank you! [Single choice]

○ We sincerely apologize, but we currently do not have a price difference refund policy. Would it be acceptable if I offer you a discount coupon as compensation?

○ Sorry, we are unable to refund the price difference. However, I can offer you a discount coupon—would that be okay?

○ We do not provide price difference refunds, but I can offer you a discount coupon.

21. I understand that different situations might have different handling methods, but I would rather not accept a coupon. It seems like other stores offer price difference refunds, why can't you do the same? I hope there can be a suitable solution. [Single choice]

○ I'm really sorry! Currently, we do not have a price difference refund policy. If there are any changes in the future, I will propose your suggestion to the leadership! Thank you for your understanding and support!

○ I'm very sorry! Currently, we indeed do not have a price difference refund policy. If there are any changes in the future, I will submit your suggestion. Thank you for your understanding.

○ Sorry, we currently do not have a price difference refund policy. However, if there are any future policy adjustments, we will consider your suggestion.

22. I understand that you have your own policies, but I still hope you can reconsider and provide a reasonable solution. [Single Choice]

○ I'm very sorry to have dissatisfied you. I will verify the situation as soon as possible and strive to provide a satisfactory solution. Thank you for your patience

○ Sorry for the dissatisfaction. I will double-check the situation and try to offer you a solution. Please bear with me

○ Sorry, I will check again and try to provide a solution

23. The service for Customer 4 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

24. Please assess Customer 4's communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

【Scenario 1 (positive group) - Section Ends】

【Scenario 2 (neutral group) - Section Starts】

1. Customer 1 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

2. I found that I have a voucher that's still valid, but I didn't use it on my last order. Can I use this voucher for a refund? [Single Choice]

○ I sincerely apologize! Vouchers generally cannot be used for refunds. If you accidentally missed using it, I recommend using it on your next order. Thank you very much for your understanding and support!

○ I'm very sorry, but vouchers typically cannot be used for refunds. If you missed using it, I suggest you use it on your next order. Thank you for your understanding!

○ Apologies, vouchers usually cannot be used for refunds. If you missed using it, you can use it on your next order. Thank you for your understanding!

3. It seems like it was possible before, why can't I do it this time? [Single Choice]

○ I sincerely apologize for the inconvenience! The previous situation was indeed different. I will help you apply for special handling from the leadership, but it may take some time. Thank you for your patience and understanding!

○ I'm very sorry, the previous situation was indeed different. I will apply for special handling from the leadership for you, but it may take some time. Thank you for your patience and understanding!

○ Apologies for the inconvenience. Our policy is different now compared to before. I will try to apply for special handling from the leadership, but it may take some time. Please be patient!

4. I have always supported your store, but if this issue isn't resolved, I might hesitate to continue purchasing from you. [Single Choice]

○ I’m truly sorry to have disappointed you! I will expedite the special approval process for you. Please be patient for a little longer. Your support means a lot to us!

○ I’m very sorry for disappointing you! I will apply for special approval as soon as possible. Please wait a moment.

○ Sorry to disappoint you! I will process it as quickly as possible and apply for special approval. Please wait a little longer.

5. The service for Customer 1 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

6. Please assess Customer 1’s communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5 ○6 ○7

7. Customer 2 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

8. The quality of the product I received is problematic. Please handle this. [Single choice]

○ We sincerely apologize! Could you please let us know what the issue is? You can briefly describe it or take a photo, and we will address it promptly to ensure your satisfaction.

○ We apologize. Could you please specify the issue? Kindly describe it or provide relevant images, and we will assist you as soon as possible.

○ Hello, could you please let us know what the specific issue is? You can briefly describe it or take a photo, and we will follow up to resolve it.

9. There is obvious damage, I will return the item. [Single Choice]

○ We sincerely apologize! Please submit a return request on the platform and upload photos as proof. We will verify and process it as soon as possible. Thank you for your understanding and support!

○ We are very sorry! You can submit a return request on the platform and upload photos of the damage as proof. We will process it as soon as possible. Thank you for your understanding and cooperation

○ If the item is indeed damaged, you may request a return. Please submit a return request on the platform and upload photos of the damage as proof. We will verify and process it as soon as possible

10. Please proceed with the process. [Single Choice]

○ We sincerely apologize for the issue! Don't worry, I will register the problem for you and assist you throughout the return process

○ Sorry for the inconvenience. I will register your case, and you only need to follow the system prompts to complete the return process

○ Alright, please follow the system prompts to complete the return process

11. The service for Customer 2 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

12. Please assess Customer 2's communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

13. Customer 3 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

14. My order was shipped 6 days ago, but there's still no update on the logistics. What's going on? [Single Choice]

○ I will check the logistics details for you right away. Please hold on.

○ Let me look into it. Please wait a moment.

○ I'll check it now.

15. Is it that you haven't shipped the order, or is it an issue with the courier company not updating the information? [Single Choice]

○ I've checked for you, and the order was shipped on time. The courier company may not have updated the tracking information yet.

○ The warehouse records show that the order has been shipped. It's possible that the courier hasn't updated the tracking details.

○ The warehouse confirms that your order was shipped on time, so it should be an issue with the courier.

16. Can't you switch to SF Express in the future? These courier companies are really bad. [Single Choice]

○ We sincerely apologize! Our partnered courier services are arranged by the company. If there are any adjustments in the future, we will definitely prioritize your suggestion! Thank you for your understanding and support!

○ Sorry, our courier service is uniformly arranged by the company, and we currently have no other options. We also have no control over it. Thank you for your understanding.

○ Apologies, our default courier service is company-arranged, and there are no other choices at the moment. If you wish to use SF Express, you may select the express service option for an additional 30 yuan when placing an order.

17. The service for Customer 3 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

18. Please assess Customer 3's communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

19. Customer 4 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

20. The items I bought a few days ago have now dropped in price. Help me refund the price difference. [Single Choice]

○ We sincerely apologize, but we currently do not have a price difference refund policy. Would it be acceptable if I offer you a discount coupon as compensation?

○ Sorry, we are unable to refund the price difference. However, I can offer you a discount coupon—would that be okay?

○ We do not provide price difference refunds, but I can offer you a discount coupon.

21. I don't want a coupon. Other stores offer price difference refunds. Process it for me. [Single Choice]

○ I'm really sorry! Currently, we do not have a price difference refund policy. If there are any changes in the future, I will propose your suggestion to the leadership! Thank you for your understanding and support!

○ I'm very sorry! Currently, we indeed do not have a price difference refund policy. If there are any changes in the future, I will submit your suggestion. Thank you for your understanding.

○ Sorry, we currently do not have a price difference refund policy. However, if there are any future policy adjustments, we will consider your suggestion.

22. If you really cannot refund the price difference, I will have to consider filing a complaint. [Single Choice]

○ I’m very sorry to have dissatisfied you. I will verify the situation as soon as possible and strive to provide a satisfactory solution. Thank you for your patience

○ Sorry for the dissatisfaction. I will double-check the situation and try to offer you a solution. Please bear with me

○ Sorry, I will check again and try to provide a solution

23. The service for Customer 4 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

24. Please assess Customer 4’s communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

【Scenario 2 (neutral group) - Section Ends】

【Scenario 3 (negative group) - Section Starts】

1. Customer 1 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

2. I have a valid voucher that I didn’t use in my previous order. Process a refund. [Single Choice]

○ I sincerely apologize! Vouchers generally cannot be used for refunds. If you accidentally missed using it, I recommend using it on your next order. Thank you very much for your understanding and support!

○ I’m very sorry, but vouchers typically cannot be used for refunds. If you missed using it, I suggest you use it on your next order. Thank you for your understanding!

○ Apologies, vouchers usually cannot be used for refunds. If you missed using it, you can use it on your next order. Thank you for your understanding!

3. Why can’t I do it? It was possible before. [Single Choice]

○ I sincerely apologize for the inconvenience! The previous situation was indeed different. I will help you apply for special handling from the leadership, but it may take some time. Thank you for your patience and understanding!

○ I’m very sorry, the previous situation was indeed different. I will apply for special handling from the leadership for you, but it may take some time. Thank you for your patience and understanding!

○ Apologies for the inconvenience. Our policy is different now compared to before. I will try to apply for special handling from the leadership, but it may take some time. Please be patient!

4. I won’t come back again. [Single choice]

○ I’m truly sorry to have disappointed you! I will expedite the special approval process for you. Please be patient for a little longer. Your support means a lot to us!

○ I’m very sorry for disappointing you! I will apply for special approval as soon as possible. Please wait a moment.

○ Sorry to disappoint you! I will process it as quickly as possible and apply for special approval. Please wait a little longer.

5. The service for Customer 1 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

6. Please assess Customer 1’s communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5 ○6 ○7

7. Customer 2 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

8. Why is the quality of your product so poor? What are you going to do about it? [Single choice]

○ We sincerely apologize! Could you please let us know what the issue is? You can briefly describe it or take a photo, and we will address it promptly to ensure your satisfaction.

○ We apologize. Could you please specify the issue? Kindly describe it or provide relevant images, and we will assist you as soon as possible.

○ Hello, could you please let us know what the specific issue is? You can briefly describe it or take a photo, and we will follow up to resolve it.

9. It's completely damaged, I will return it. [Single Choice]

○ We sincerely apologize! Please submit a return request on the platform and upload photos as proof. We will verify and process it as soon as possible. Thank you for your understanding and support!

○ We are very sorry! You can submit a return request on the platform and upload photos of the damage as proof. We will process it as soon as possible. Thank you for your understanding and cooperation

○ If the item is indeed damaged, you may request a return. Please submit a return request on the platform and upload photos of the damage as proof. We will verify and process it as soon as possible

10. Why do I need to upload anything? Just process my return! [Single choice]

○ We sincerely apologize for the issue! Don't worry, I will register the problem for you and assist you throughout the return process

○ Sorry for the inconvenience. I will register your case, and you only need to follow the system prompts to complete the return process

○ Alright, please follow the system prompts to complete the return process

11. The service for Customer 2 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

12. Please assess Customer 2's communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

13. Customer 3 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

14. The order has been shipped for days, and there is still no update. What's wrong with you? [Single Choice]

○ I will check the logistics details for you right away. Please hold on.

○ Let me look into it. Please wait a moment.

○ I'll check it now.

15. You haven't shipped it at all, have you? [Single choice]

○ I've checked for you, and the order was shipped on time. The courier company may not have updated the tracking information yet.

○ The warehouse records show that the order has been shipped. It's possible that the courier hasn't updated the tracking details.

○ The warehouse confirms that your order was shipped on time, so it should be an issue with the courier.

16. If you don't switch to SF Express, you as well stop doing business. [Single Choice]

○ We sincerely apologize! Our partnered courier services are arranged by the company. If there are any adjustments in the future, we will definitely prioritize your suggestion! Thank you for your understanding and support!

○ Sorry, our courier service is uniformly arranged by the company, and we currently have no other options. We also have no control over it. Thank you for your understanding.

○ Apologies, our default courier service is company-arranged, and there are no other choices at the moment. If you wish to use SF Express, you may select the express service option for an additional 30 yuan when placing an order.

17. The service for Customer 3 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

18. Please assess Customer 3's communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

19. Customer 4 is seeking your assistance. Please evaluate your willingness to serve (1 represents least willing, 5 represents most willing; if you feel neutral, please select 3) [Scale]

[Unwilling, Willing]

○1 ○2 ○3 ○4 ○5

20. Why did the price drop just a few days after I made my purchase? Isn't this deceiving consumers? Refund me the price difference immediately. [Single choice]

○ We sincerely apologize, but we currently do not have a price difference refund policy. Would it be acceptable if I offer you a discount coupon as compensation?

○ Sorry, we are unable to refund the price difference. However, I can offer you a discount coupon—would that be okay?

○ We do not provide price difference refunds, but I can offer you a discount coupon.

21. Everybody else can refund the price difference, but not you? [Single Choice]

○ I'm really sorry! Currently, we do not have a price difference refund policy. If there are any changes in the future, I will propose your suggestion to the leadership! Thank you for your understanding and support!

○ I'm very sorry! Currently, we indeed do not have a price difference refund policy. If there are any changes in the future, I will submit your suggestion. Thank you for your understanding.

○ Sorry, we currently do not have a price difference refund policy. However, if there are any future policy adjustments, we will consider your suggestion.

22. Complained. [Single Choice]

○ I'm very sorry to have dissatisfied you. I will verify the situation as soon as possible and strive to provide a satisfactory solution. Thank you for your patience

○ Sorry for the dissatisfaction. I will double-check the situation and try to offer you a solution. Please bear with me

○ Sorry, I will check again and try to provide a solution

23. The service for Customer 4 is now complete. Please assess your emotion after this service (1 being most negative, 5 being most positive, select 3 if you feel neutral). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

24. Please assess Customer 4's communication attitude (1 represents the most negative, 5 represents the most positive, and if you feel neutral, please choose 3). [Scale]

[Negative, Positive]

○1 ○2 ○3 ○4 ○5

【Scenario 3 (negative group) - Section Ends】

Appendix 5a: Questionnaire for Study 5a

Welcome to this research.

You are an executive at a large technology company, and today your R&D team is presenting the latest product development plan to you.

Notes: Participants were assigned to read 4 high-tech innovation product descriptions and answer corresponding questions. The order of the four product descriptions was randomized for each participant.

【Head-on - Section Starts】

Please read the following product description:

Product overview:
Head-on is the latest brain-computer interface (BCI) headset that enables seamless connectivity with the digital world by capturing and interpreting your brainwaves. Unlike traditional BCIs, Head-on features a completely non-invasive design, requiring no hardware implants. Simply wear this sleek headset to control everything with your mind—whether at work, gaming, or in daily life. Head-on offers an unparalleled smart experience, eliminating the need for manual interaction

Appearance description:

The Head-on headset is lightweight, comfortable, and made with soft materials and a streamlined design that fits perfectly on your head. Its modern, minimalist aesthetic ensures it's suitable for extended wear. Equipped with multiple micro-electrode sensors, it captures brainwave signals in real time to decode your thoughts

Core feature introduction:

1. Effortless Control at Your Fingertips: With Head-on's brainwave sensors, you can directly control smart home devices, cars, and office equipment using your thoughts. Adjust temperature, play music, or operate appliances without lifting a finger, making your life more efficient and convenient.

2. Real-Time Health Monitoring: Head-on continuously monitors your brainwaves, providing precise feedback on your emotions, stress, and anxiety levels. It offers personalized stress-relief recommendations, helping you maintain mental well-being and inner balance.

3. Immersive Virtual Reality Interaction: With Head-on, you can interact with virtual worlds without controllers. Control virtual characters or objects using your mind for a more natural and immersive experience, breaking the boundaries between reality and virtuality.

4. Enhanced Memory and Cognitive Training: Head-on not only boosts focus and learning efficiency but also customizes cognitive training programs based on your needs. Through brainwave stimulation and training, it helps keep your brain active and supports peak performance in work and study

1. Head-on is an invasive device. [Single choice]

○ Yes

○ No

2. After using Head-on, a controller is still required to interact with virtual characters [Single choice]

○ Yes

○ No

3. Which devices mentioned in the text can be controlled using Head-on? [Multiple choice]

☐ Smart home devices

☐ cars

☐ Office equipment

☐ Access control systems

4. Do you think Head-on is a high-tech innovative product? [Single choice]

○ Yes

○ No

5. How do you feel after reading the description of Head-on? [Scale]

[Most negative (doubt, distrust), most positive (excitement, curiosity)]

○1 ○2 ○3 ○4 ○5 ○6 ○7

6. Do you support further development of Head-on? [Scale]

[Completely unsupportive, strongly supportive]

○1 ○2 ○3 ○4 ○5 ○6 ○7

【Head-on - Section Ends】

【VisioLink - Section Starts】

Please read the following product description:

Product overview:
VisioLink is a groundbreaking augmented reality smart glasses that combines advanced visual technology with artificial intelligence, offering an unprecedented immersive experience. Unlike traditional smart glasses such as Ray-Ban Meta, VisioLink not only features basic functionalities like voice control, but also comes equipped with innovative features such as real-time information projection, eye-tracking control, and emotion management, transforming your experiences in life, work, and entertainment.

Appearance description:

VisioLink glasses feature a stylish and lightweight design, made with an ultra-light titanium alloy frame and high-strength transparent smart lenses, combining modern aesthetics with elegance, making them suitable for various occasions. The built-in micro display presents high-definition images and real-time information directly in front of your eyes, ensuring efficiency and convenience at all times. The unique fluoroscopy functionality perfectly blends the virtual and real worlds, providing an immersive experience and allowing you to enjoy every moment of smart technology.

Core feature introduction:

1. Augmented Reality, Comprehensive Enhancement: Leveraging advanced RTC technology, VisioLink enables real-time information projection and dynamic virtual content interaction, significantly enhancing the interactivity of the real world. Whether it’s store promotions, real-time navigation, or emotional feedback from the surrounding crowd, the glasses automatically

recognize and project useful virtual information in front of your eyes, helping you make optimal decisions at all times.

2. Eye Movement Control, Smooth and Natural: With just a slight movement of your eyes, you can seamlessly switch between screens, browse the web, scroll through social media, or even control video playback and pause. A slight shift in eye movement activates task management and voice assistants, making every interaction more intuitive and natural. This breaks through the limitations of traditional touch controls, offering an unprecedented level of control experience.

3. Emotion Recognition, Intelligent Management: VisioLink not only senses the world around you but also understands your inner world. By analyzing eye movements, facial expressions, and physiological signals, the glasses can assess your emotional state in real-time. When you're feeling stressed or anxious, the glasses will remind you to take a break and offer meditation exercises. If you're feeling excited or creatively inspired, the system will automatically adjust the ambient lighting and temperature to help you enter your optimal working state. Combining data such as heart rate and breathing frequency, the glasses will also provide personalized health recommendations to alleviate stress, maintaining psychological and physiological balance and helping you return to your best state at any time.

1. VisioLink is a product with the same functionality as Ray-Ban Meta smart glasses. [Single choice]

○ Yes

○ No

2. VisioLink can determine the user's emotional state by combining EEG (electroencephalogram) data. [Single choice]

○ Yes

○ No

3. What features of VisioLink are mentioned in the text? [Multiple choices]

☐ Real-time information projection

☐ Eye movement control

☐ Emotion recognition

☐ EEG recognition

4. Do you think VisioLink is a high-tech innovative product? [Single choice]

○ Yes

○ No

5. How do you feel after reading the description of VisioLink? [Scale]

[Most negative (doubt, distrust), most positive (excitement, curiosity)]

○1 ○2 ○3 ○4 ○5 ○6 ○7

6. Do you support further development of VisioLink? [Scale]

[Completely unsupportive, strongly supportive]

○1 ○2 ○3 ○4 ○5 ○6 ○7

【VisioLink - Section Ends】

【RunFit Pro - Section Starts】

Please read the following product description:

Product overview:
RunFit Pro is a groundbreaking smart running shoe that combines innovative comfort, advanced sports technology, and personalized health management features. Designed specifically for runners seeking efficient performance and a healthy lifestyle, whether professional athletes or fitness enthusiasts, RunFit Pro offers the most comfortable and intelligent running experience. It helps enhance athletic performance, protect your feet, and take every step toward better health.

Appearance description:

RunFit Pro features a streamlined design with a modern, minimalist appearance. The upper is made from high-tech breathable materials, ensuring your feet stay dry during running. The sole incorporates patented smart foam technology, providing high elasticity and shock-absorbing properties, effectively reducing impact and minimizing the risk of sports injuries. Available in a

variety of vibrant colors, the shoes cater to different consumer preferences while adding extra motivation to your run.

Core feature introduction:

1. Smart Running Monitoring and Analysis: RunFit Pro is equipped with built-in smart sensors that track real-time running data such as cadence, stride length, pace, and calories burned. The data is synchronized to a mobile app for detailed analysis. Using intelligent algorithms, the shoes assess your running posture and provide personalized running suggestions to help improve your technique and avoid sports injuries.

2. Dynamic Comfort Adjustment: RunFit Pro features a dynamic comfort adjustment system. The insole automatically adjusts its hardness and elasticity based on your running intensity. During high-speed runs, the insole increases support to stabilize your feet, while during light running or jogging, it provides a softer experience to reduce pressure and protect your feet.

3. Smart Pressure Distribution and Shock Absorption System: The sole incorporates an innovative smart shock-absorbing system that dynamically adjusts pressure distribution based on your weight and running posture. This ensures optimal shock absorption with every step. Whether running on hard surfaces or a treadmill, the intelligent shock-absorbing design effectively alleviates impact and reduces pressure on the knees and spine, protecting key areas during exercise.

1. RunFit Pro can analyze data and evaluate running posture on its own, then provide feedback to the runner via voice. [Single choice]

○ Yes

○ No

2. RunFit Pro is only suitable for outdoor running. [Single choice]

○ Yes

○ No

3. Do you think VisioLink is a high-tech innovative product? [Single choice]

○ Yes

○ No

4. How do you feel after reading the description of RunFit Pro? [Scale]

[Most negative (doubt, distrust), most positive (excitement, curiosity)]

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7

5. Do you support further development of RunFit Pro? [Scale]

[Completely unsupportive, strongly supportive]

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7

【RunFit Pro - Section Ends】

【RelaxPro 360 - Section Starts】

Please read the following product description:

Product overview:
RelaxPro 360 is an innovative smart massage chair that combines advanced massage technology with artificial intelligence, aiming to provide you with a personalized full-body massage experience. Whether it's relieving fatigue, relaxing the body and mind, or improving blood circulation, RelaxPro 360 offers an unprecedented level of comfort. Its intelligent adjustment system can provide customized massage services based on your body's needs, making each massage session a perfect journey for both your body and mind.

Appearance description:

RelaxPro 360 features a modern minimalist design, with an elegant appearance and streamlined shape that easily blends into any home or office environment. The high-quality leather material and soft padding ensure that you experience unparalleled comfort while enjoying the massage. The backrest and seat are ergonomically designed to perfectly fit your body curves, providing optimal support and relaxation.

Core feature introduction:

1. Smart Customized Massage Experience: With built-in smart sensors, RelaxPro 360 can scan and analyze your body structure and muscle condition, automatically adjusting massage intensity,

speed, and modes to provide personalized massage services. Whether you need deep relaxation or gentle soothing, RelaxPro 360 can precisely adjust according to your needs, ensuring each area receives just the right amount of attention.

2. Smart Heating Function: RelaxPro 360 features a built-in smart heating system that can adjust different temperatures according to your needs, helping to relieve muscle stiffness, ease joint pain, and enhance the massage effect. Whether offering warmth and comfort on cold days or relieving muscle fatigue after exercise, the smart heating function provides an additional layer of comfort.

3. Adaptive Massage Mode: RelaxPro 360 is equipped with multiple massage modes, including relaxation, recovery, soothing, and energy recharge, allowing you to choose the most suitable mode based on your needs. The unique adaptive massage technology adjusts the intensity and rhythm of the massage according to your posture and body shape, ensuring every session is thoroughly enjoyable.

4. Personalized Voice Control and Smart App: RelaxPro 360 supports voice control, allowing you to simply voice your preferences, and the massage chair will automatically adjust to your desired mode and intensity. Additionally, you can use the exclusive app to make more personalized settings, view massage records, and track health data, helping you gain a comprehensive understanding of your health status.

1. RelaxPro 360 has functions like heating and cooling. [Single choice]

○ Yes

○ No

2. RelaxPro 360 requires voice commands to start the massage. [Single choice]

○ Yes

○ No

3. Do you think VisioLink is a high-tech innovative product? [Single choice]

○ Yes

○ No

4. How do you feel after reading the description of RelaxPro 360? [Scale]

[Most negative (doubt, distrust), most positive (excitement, curiosity)]

○1 ○2 ○3 ○4 ○5 ○6 ○7

5. Do you support further development of RelaxPro 360? [Scale]

[Completely unsupportive, strongly supportive]

1 ○2 ○3 ○4 ○5 ○6 ○7

【RelaxPro 360 - Section Ends】

【Demographics - Section Starts】

Please select your gender [Single choice]

○ Male

○ Female

Please select your age group [Single choice]

○ 0-20 years old

○ 21-30 years old

○ 31-40 years old

○ 41-50 years old

○ 51-60 years old

○ 60 years old and above

Please select your city [City]

【Demographics - Section Ends】

Appendix 5b: Questionnaire for Study 5b

Welcome to this research.

Please read the following introduction of the innovative product and answer the relevant questions.

Notes: Participants were assigned to read 4 radical innovation product descriptions and answer corresponding questions. The order of the four product descriptions was randomized for each participant.

【Tri-Fold Smartphone - Section Starts】

Please read the following product description:

Product overview:

The Huawei tri-fold smartphone is the world's first mass-produced triple-folding smartphone. It made its domestic debut in September 2024 and was globally unveiled at Huawei's Innovation Product Global Launch in Kuala Lumpur, Malaysia, in February 2025. With its groundbreaking triple-fold design and outstanding performance, this smartphone redefines the shape and functionality of smartphones.

Key features:

1. Screen and Folding Technology: The Huawei triple-folding smartphone is equipped with a 10.2-inch 3K immersive large screen, supporting three folding modes: single-screen, dual-screen, and triple-screen, allowing users to switch freely according to their needs. The screen uses multi-directional flexible materials and ultra-large UTG glass to ensure durability and stability. The hinge section features Huawei's self-developed "Tiangong Hinge System," which achieves perfect integration between the hinge and screen through precise mechanical structures and micron-level digital twin modeling.

2. Performance and Battery Life: The smartphone is powered by Huawei's latest Kirin 9020 chip, offering strong performance and supporting 5G and 5.5G networks. It has a built-in 5600mAh large capacity battery, supporting 66W wired fast charging and 50W wireless charging, ensuring long-lasting use and quick charging.

3. Imaging System: The rear camera module includes a 10-stop physically variable aperture main camera, an ultra-wide-angle lens, and a 5.5x periscope telephoto lens, supporting full focal length coverage. Whether for daily shots or professional photography, it can handle all with ease.

4. Software and Ecosystem: The smartphone comes pre-installed with the pure HarmonyOS NEXT 5.0 system, completely eliminating the Android compatibility layer, enabling full-scene distributed capabilities and a smoother interactive experience. Multi-screen collaboration, AI smart assistants, and other features further enhance ease of use.

Figure 20: Tri-Fold Smartphone

1. The Huawei tri-fold smartphone can be optionally equipped with the Android system. [Single Choice]

○ Yes

○ No

2. The Huawei tri-fold smartphone's hinge section uses the "Tiangong Hinge System" developed by internationally renowned designers, achieving a perfect fit between the hinge and the screen. [Single Choice]

○ Yes

○ No

3. Do you think the Huawei trip-fold smartphone is a radical innovation product (Radical innovation refers to highly novel advancements that break from the status quo and emerge from non-obvious paths or ideas, presenting both significant challenges and opportunities. In contrast, incremental innovation involves a lower degree of novelty)?

○ Yes

○ No

4. How do you feel after reading the description of Tri-Fold Smartphone? [Scale]

[Most negative (doubt, distrust), most positive (excitement, curiosity)]

○1 ○2 ○3 ○4 ○5 ○6 ○7

5. Do you support further development of Tri-Fold Smartphone? [Scale]

[Completely unsupportive, strongly supportive]

○1 ○2 ○3 ○4 ○5 ○6 ○7

【Tri-Fold Smartphone - Section Ends】

【ForeverGone - Section Starts】

Please read the following product description:

Product overview:

ForeverGone is an integrated solution launched by Gradiant, specifically designed for the permanent removal and destruction of per- and polyfluoroalkyl substances (PFAS). PFAS, known as “forever chemicals,” are highly persistent in the environment and pose risks to human health. ForeverGone combines microbubble fractionation and electro-oxidation technologies to efficiently treat contaminated water sources, ensuring that water quality meets or exceeds drinking water standards.

Key features:

1. Microbubble Fractionation: By injecting billions of microbubbles, PFAS are separated and concentrated into a microfoam, facilitating subsequent destruction. This process requires no harsh chemicals and generates no waste.

2. Electro-Oxidation Destruction: Using proprietary electrodes, electro-oxidation permanently converts the concentrated PFAS microfoam into harmless byproducts, eliminating the need for traditional landfill or incineration methods.

3. Efficiency & Sustainability: ForeverGone achieves comprehensive PFAS removal at the lowest total cost while setting new standards in simplicity, efficiency, and sustainability.

Figure 21: ForeverGone

1. Compared to traditional landfill or incineration methods, ForeverGone requires only a minimal amount of harsh chemicals to completely destroy PFAS. [Single choice]

○ Yes

○ No

2. The cost of PFAS treatment with ForeverGone is high. [Single choice]

○ Yes

○ No

3. Do you think ForeverGone is a radical innovation product (Radical innovation refers to highly novel advancements that break from the status quo and emerge from non-obvious paths or ideas, presenting both significant challenges and opportunities. In contrast, incremental innovation involves a lower degree of novelty)?

○ Yes

○ No

4. How do you feel after reading the description of ForeverGone? [Scale]

[Most negative (doubt, distrust), most positive (excitement, curiosity)]

○1 ○2 ○3 ○4 ○5 ○6 ○7

5. Do you support further development of ForeverGone? [Scale]

[Completely unsupportive, strongly supportive]

○1 ○2 ○3 ○4 ○5 ○6 ○7

【ForeverGone - Section Ends】

【DermaSensor - Section Starts】

Please read the following product description:

Product overview:

DermaSensor is an AI-powered medical device designed for skin cancer detection. It can identify the three most common types of skin cancer: melanoma, basal cell carcinoma, and squamous cell carcinoma. The device aims to assist primary care physicians in quickly assessing suspicious skin lesions, reducing missed diagnoses, and improving diagnostic accuracy. DermaSensor has been launched in Australia, New Zealand, and Europe and is preparing for entry into the U.S. market.

Key features:

1. Skin Cancer Detection: DermaSensor can detect melanoma, basal cell carcinoma, and squamous cell carcinoma, covering the most common types of skin cancer.

2. Non-Invasive Scanning: Using elastic scattering spectroscopy (ESS) technology, DermaSensor emits light of different wavelengths to interact with skin cells, analyzing cellular-level information of the lesion through its device tip.

3. AI Risk Assessment: After scanning, the built-in AI algorithm immediately analyzes the data and provides a risk assessment result within seconds, alerting doctors if further investigation or monitoring is needed.

4. High Sensitivity and Specificity: Clinical trials have shown that DermaSensor achieves 96% sensitivity and 97% specificity in detecting skin cancer, effectively reducing unnecessary biopsies.

5. Suitable for All Skin Types: The device performs consistently across different skin types, making it an effective tool for comprehensive skin cancer screening.

Figure 22: DermaSensor

1. DermaSensor's AI algorithm can currently only provide a risk assessment result within 1 second. [Single choice]

○ Yes

○ No

2. DermaSensor is primarily designed to help individuals monitor their risk of skin cancer at home in a timely manner. [Single choice]

○ Yes

○ No

3. Do you think DermaSensor is a radical innovation product (Radical innovation refers to highly novel advancements that break from the status quo and emerge from non-obvious paths or ideas, presenting both significant challenges and opportunities. In contrast, incremental innovation involves a lower degree of novelty)?

○ Yes

○ No

4. How do you feel after reading the description of DermaSensor? [Scale]

[Most negative (doubt, distrust), most positive (excitement, curiosity)]

○1 ○2 ○3 ○4 ○5 ○6 ○7

5. Do you support further development of DermaSensor? [Scale]

[Completely unsupportive, strongly supportive]

○1 ○2 ○3 ○4 ○5 ○6 ○7

【DermaSensor - Section Ends】

【Galy Literally Cotton - Section Starts】

Please read the following product description:

Product overview:

Galy is a U.S.-based sustainable agriculture startup that cultivates “cellular cotton” in laboratories, completely stepping outside the traditional agricultural framework and eliminating the series of processes involved in growing and harvesting cotton. Inspired by the “lab-grown meat” industry, Galy’s founders applied laboratory cultivation technology to cotton production, aiming to reduce the negative environmental impacts of cotton farming, such as pesticide use, water consumption, and carbon emissions.

Key features:

1. Efficient Production: Traditional cotton farming takes about 180 days, while Galy’s “cellular cotton” only requires 18 days, making the production process 10 times more efficient.

2. Environmental Benefits: Compared to traditional cotton farming, Galy’s “cellular cotton” reduces water usage by 99%, land usage by 97%, and carbon emissions by 77%.

3. Medical-Grade Purity: Since it is cultivated in a laboratory, Galy’s “cellular cotton” meets medical-grade purity standards, making it suitable for medical and consumer products such as gauze, absorbent cotton, and makeup cotton pads.

4. Sustainability: Galy's technology reduces dependence on soil, pesticides, and fertilizers, offering a more sustainable cotton production solution for the textile industry.

Figure 23: Galy Literally Cotton

1. Currently, 'cellular cotton' requires about one month for the production cycle, which is 10 times more efficient than traditional cultivation.

○ Yes

○ No

2. The 'cellular cotton' has reached food-grade purity standards, but has not reached medical-grade

○ Yes

○ No

3. Do you think Galy Literally Cotton is a radical innovation product (Radical innovation refers to highly novel advancements that break from the status quo and emerge from non-obvious paths or ideas, presenting both significant challenges and opportunities. In contrast, incremental innovation involves a lower degree of novelty)?

○ Yes

○ No

4. How do you feel after reading the description of Galy Literally Cotton? [Scale]

[Most negative (doubt, distrust), most positive (excitement, curiosity)]

○1 ○2 ○3 ○4 ○5 ○6 ○7

5. Do you support further development of Galy Literally Cotton? [Scale]

[Completely unsupportive, strongly supportive]

○1 ○2 ○3 ○4 ○5 ○6 ○7

【Galy Literally Cotton - Section Ends】

【Demographics - Section Starts】

Please select your gender [Single choice]

○ Male

○ Female

Please select your age group [Single choice]

○ 0-20 years old

○ 21-30 years old

○ 31-40 years old

○ 41-50 years old

○ 51-60 years old

○ 60 years old and above

Please select your city [City]

【Demographics - Section Ends】