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Not peer-reviewed version

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Posted Date: 9 June 2025

doi: 10.20944/preprints202506.0662.v1

Keywords: Technology; AI; Internet of things; Personality

 doi:10.20944/preprints202506.0662.v1

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Personality Traits and Technology

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Article Highlights:

- AI is becoming increasingly integrated into everyday life across multiple domains.
- Individuals' personality traits, attachment styles and cognition play a crucial role in the adoption of AI technology.
- Technological personalisation can improve user satisfaction and emotional outcomes.
- Ethical considerations are essential in AI-driven personalisation to prevent misuse.

Abstract: The rapid integration of various technologies and especially Artificial Intelligence (AI) into daily life necessitates understanding its interaction with human behaviour and personality traits. This paper examines how different personality dimensions shape adoption and attitudes toward various technologies, including communication, transportation, medical, and AI tools. The findings underscore the need to design such technologies for a diverse audience, as aligning technology with personality traits can significantly boost user satisfaction and promote well-being.

Keywords: technology; psychology; AI; personality

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1. Introduction

As technology becomes more integrated into our daily lives, understanding how personality traits influence human-technology interaction and its impact on well-being has become critical. This is particularly relevant as AI becomes a widely accessible tool that shapes education [1], corporate work [2], and medicine [3]. Exploring how personality traits influence adoption and attitudes toward these technologies is essential to maximizing their benefits while reducing adverse effects and ultimately improving emotional well-being.

The current paper reviews the relationship between personality traits and different technologies, while discussing the advantages of personalizing technology. This review focuses on four technological domains: communication, transportation, medical technologies, and artificial intelligence (AI) and Internet of things (IoT) tools. The analysis is grounded in several main personality theories: the Big 5 model [4,5]; Attachment Theory [6]; need for closure [7,8]; need for cognition [9,10] Sensation Seeking [11,12]; and The Dark Triad of Personality [13–15]

2. Personality Traits and Technology

Personality can be measured using frameworks, such as traits, motivations, and self-efficacy [16]. Leading theories relating to personality include the Big 5 model [4,5], which measures five traits: openness, conscientiousness, extraversion, agreeableness, and neuroticism; Attachment Theory [6]: linking early caregiving to future relationships need for closure [7,8] need for cognition [9,10]; Sensation Seeking [11,12]; The Dark Triad of Personality [13–15]. In the rest of this section, we examine how each theory contributes to understanding the use of technology.

The Five-Factor Model [4,5], or "Big Five," is a widely accepted method for measuring personality traits. The first trait, Openness to Experience (inventive/curious vs. consistent/cautious), reflects the degree of intellectual curiosity, creativity, and preference for novelty. Individuals high in openness, driven by curiosity and creativity, are best served by innovative and cutting-edge technologies [17]. Their love for exploration and novelty makes them early adopters. Technologies targeting these users should highlight innovation, creativity, and frequent updates to keep them engaged [18]. Virtual reality (VR), augmented reality (AR), and AI-driven creative tools like music and art generators are particularly appealing. Social networking platforms offering diverse content and novel interaction methods also align with their preference for exploration.

The second trait, Conscientiousness (efficient/organized vs. extravagant/careless), measures reliability, organization, and goal orientation. Conscientious individuals, who are organized, dependable, and task-focused, benefit most from productivity-enhancing tools [19]. Technologies for this group should prioritize functionality, reliability, and planning features. Project management software, organizational apps, and educational platforms with structured learning and goal-setting are ideal. Once they see the value of a technology, conscientious individuals integrate it into their routine [19], making health and fitness tracking apps that support regimented routines particularly suitable for their goal-oriented nature.

The third, Extraversion (outgoing/energetic vs. solitary/reserved), assesses sociability, assertiveness, and emotional expressiveness. Extraverts thrive with technologies that facilitate social interaction [20,21]. Any technology aiming to be created for extroverts should offer robust communication, content sharing, and community building features. Social networking sites, communication tools, and collaborative platforms that enable frequent social engagements and community involvement are highly suitable [17].

The fourth trait, Agreeableness (friendly/compassionate vs. critical/judgmental), relates to kindness, trust, and empathy. Agreeable individuals, who value trust and cooperation, prefer technologies that encourage social harmony and collaboration [22]. Technologies should focus on teamwork, social networking, and positive interactions. Collaboration tools, social apps for community engagement, volunteering and social causes are ideal for them.

Finally, the fifth trait, Neuroticism (sensitive/nervous vs. resilient/confident), involves emotional stability and the tendency toward negative emotions. Individuals high in neuroticism, who experience emotional instability, benefit from apps that offer emotional support, stress relief, and relaxation techniques [23]. For this group, a user-friendly interface with clear privacy and security features is key [24]. Apps providing emotional support, such as mental health tools and meditation apps, can help manage their anxiety and emotional instability.

Attachment theory [6,25] is a foundational psychological model that explains how early relationships with caregivers influence attachment styles in later life [26–28]. The theory expands on four styles of attachment: 1) Secure attachment: Individuals with high self-esteem and trust, who form stable and fulfilling relationships. 2) Pre-occupied attachment style: Individuals with low self-esteem but high trust, seek relationships yet fear rejection. 3) Dismissive attachment style: Individuals with high self-esteem but low trust, avoid close relationships despite believing they deserve them. 4) Fearful-avoidant attachment style: Individuals with low self-esteem and low trust struggle to form close relationships.

While attachment styles are initially shaped by early caregiving, it's important to note that they are not fixed. They can be influenced and adapted by later life events and relationships, offering a sense of reassurance about the potential for change. Securely attached individuals thrive on social networking sites and communication tools that foster positive relationships, benefiting from customizable experiences with comprehensive features [29]. Those with anxious attachment styles need platforms offering constant social feedback and validation [30]. Avoidant individuals prefer technologies that promote self-sufficiency and independence, such as self-improvement apps and online learning platforms.

The need for closure [7,8] refers to the desire for definitive answers and discomfort with ambiguity. People with a high need for closure tend to form quick, rigid opinions and avoid conflicting information [31]. Those with a low need for closure tend to remain open-minded and explore multiple viewpoints before forming conclusions. The need for closure also affects technology preferences. Individuals with a high need for closure avoid uncertainty and prefer more straightforward, "flat" websites without hyperlinks, while those with a low need for closure enjoy exploring additional information [31,32] Interestingly, this preference reverses under time pressure, as individuals with a high need for closure prefer more information when rushed.

The need for cognition [9,10] refers to the enjoyment of thinking and engaging in cognitive tasks. Individuals with a high need for cognition seek intellectual challenges and are naturally curious [33], while those with a low need prefer to rely on simple cues or heuristics to make decisions and avoid mental effort. The need for cognition and the need for closure are essential frameworks for understanding human interaction with technology. Individuals with a low need for cognition are attracted to aesthetically pleasing technology, while those with a high need for cognition prefer information-rich sites [34,35].

Sensation seeking [11,12] refers to a personality trait characterized by pursuing new and thrilling experiences, which may involve social or physical risks [12]. Sensation seekers are drawn to exploration and adventure, while sensation avoiders may find such novel experiences overwhelming or harmful [36]. *The dark triad of personality* comprises three socially aversive traits [13–15]: 1) Machiavellianism: manipulative and strategic behaviour. 2) Narcissism: inflated self-importance and need for admiration. 3) Psychopathy: impulsivity and a lack of empathy. Individuals with high levels of dark triad traits are drawn to high-prestige, status-enhancing technologies that facilitate strategic manipulation and public displays of achievements [13]. Technologies targeting these users should emphasize prestige and exclusivity. However, it's crucial to be aware that such individuals may exploit features, including AI integrations, for unethical purposes like cheating and manipulation [37].

3. Personality Traits and Technology Adoption

Amichai-Hamburger [38,39] was one of the first to emphasize that technology should be tailored to different personality types to enhance emotional well-being. For starters, personality traits can be pivotal in determining whether someone embraces or resists new technology [40]. Early adopters are often young, novelty-seekers, and opinion leaders, who help set trends and drive broader adoption [41,42]. Their acceptance is crucial in determining a technology's success [43].

Individuals high in openness are naturally drawn to exploring and using new digital tools, driven by curiosity and a desire for new experiences, often making them early adopters of technology [21,44]. Research shows that early adopters of social networks are more likely to share information if they score high in extraversion, openness, and conscientiousness [40]. Similarly, those high in openness and low in neuroticism and extraversion are more likely to adopt self-driving cars [45], while early adopters of cryptocurrency tend to be overconfident men, high in extraversion, and low in agreeableness [46]. Additionally, individuals with a high need for cognition more readily engage in the mental effort required for adopting new technologies, basing their decisions on perceived usefulness and performance expectations [47].

All traits of the Dark Triad of Personality [13]—narcissism, Machiavellianism, and psychopathy—are linked to a higher likelihood of adopting new technology. Narcissistic individuals, in particular, are drawn to the perceived prestige of a product. They seek status symbols that boost self-esteem and enhance their image [13]. For example, the iPhone, widely viewed as a status symbol due to its price, appeals to narcissists. A study by Iaia et al. [48] found that individuals high in narcissism perceive greater mass prestige in smartphones, with younger men showing the strongest correlations. Aplin-Houtz et al. [49] also found that narcissism positively correlates with the perceived usefulness of new technologies, increasing acceptance.

Attachment style is another critical factor influencing attitudes toward Information and Communication Technologies (ICT) adoption, in this case, mainly through electronic word-of-mouth (e-WOM). Park et al. [50] found that individuals with avoidant attachment styles are less likely to adopt social media recommended via e-WOM and are less likely to use these platforms for social support. This stems from both their preference for self-sufficiency and low interpersonal trust.

 doi:10.20944/preprints202506.0662.v1

Technophobia, on the other hand, is linked to a high score in neuroticism and a low in openness [51,52]. Among older adults, technophobia is associated with lower agreeableness, openness, and emotional stability, making them more resistant to adoption and requiring more personalized approaches [53]. Technophobes often feel anxious or avoid technology due to their lack of confidence in their ability to use it [54].

4. Information and Communication Technologies

Information and Communication Technologies (ICT), including social media, video conferencing, video games, and phones, has transformed global interactions [55]. ICT provides productivity and communication on a global scale and covers a wide range of technologies, including medical tech [56]. Information and communication technologies, like Facebook, have become a dominant form of interaction, with over 5 billion social media users worldwide [57]. These platforms, however, have consistently shown adverse effects on young adults' mental health, often due to unfavorable social comparisons [58]. Such comparisons can lead to body image issues, eating disorders, and "FOMO" (fear of missing out) [59,60], with neurotic individuals particularly vulnerable to FOMO [60,61]. Social media addiction, more prevalent among women than men [62], can worsen depression. Personality plays a significant role in addictive behaviors, with introverted and neurotic individuals more likely to develop problematic internet use [60]. This addiction extends to other ICT technologies like video games, with highly open individuals showing increased playing frequency [63].

Extroverts find social media beneficial to their sociable nature, often leading to higher usage and potential addiction [20,21]. They readily adopt features like online communities, content sharing, and app integration to maintain social connections [18,64] and embrace collaborative tools that enhance interaction and teamwork [17]. Introverts, interestingly, share more private information online, perhaps for self-promotion, though extroverts generally maintain larger online friend networks [65]. Extraversion is also linked to increased online gaming, where social features like chat boxes provide social enrichment [66,67].

Individuals with anxious attachment styles are more likely to seek out opinions on social networking sites, driven by their need for external validation [50]. Similar patterns are seen in romantic relationships, where avoidant individuals communicate less frequently through phone or text, viewing these modes as too intimate [29]. This reflects their general reluctance to form close emotional bonds through communication technologies.

Conversely, communication technologies can also offer vital support for mental health [68]. Social networking sites help people who struggle with face-to-face interactions by facilitating online social connections. These platforms provide access to peer support networks, where individuals can seek advice and encouragement. Additionally, they can aid in engagement and retention in mental health services, offering ongoing support throughout treatment [68]. This can be especially helpful for introverted individuals who feel they can express their "true selves" through the anonymity of the internet [69].

Individuals high in openness tend to have more online friends than those lower in openness, this may well be because they view communication platforms as opportunities for creativity and collaboration [17,65]. Open individuals enjoy experimenting with social media, appreciating the variety of experiences such platforms offer, such as networking with diverse groups and exploring new content [18,70]. Individuals who score highly on the agreeableness scale hold positive beliefs about the usefulness of such technologies, thus making them highly likely to adopt them. Moreover, they value technology that enhances social bonds and collaborative efforts [22].

The "poor-get-richer" theory offers insight into how introverts benefit from communication technologies. It suggests that socially disadvantaged individuals, such as those experiencing loneliness or low friendship support, gain more from social media, helping them enhance their social connections and well-being [71]. Multiple studies support the poor-get-richer theory, for example Beyens et al. [72] found that adolescents with low friendship support and high loneliness experienced significant benefits from social media. Similarly, during the COVID-19 pandemic, introverts reported high satisfaction with online education due to fewer social anxieties [73]. Additionally, introverts and neurotic individuals often feel they can express their "real selves" online especially in an anonymous environment, further supporting the theory [61].

The "rich-get-richer" hypothesis suggests that socially well-off individuals benefit more from social networking sites than introverts, using these platforms to enhance their social experiences [74,75]. For example, Moshkovitz and Hayat [76] found that when introverts and extroverts have similar network sizes on X (formerly known as Twitter), extroverts gain more social capital. Extroverts also tend to have more Facebook friends. Amichai-Hamburger et al. [35] suggested that when the online group is dominated by people who are known to each other from the offline, it will be the rich who get richer, namely the extroverts will receive more social benefits from the group. Conversely, when the group is made up of people who are new to each other, it is likely that it is the poor who get richer, namely the introverts will benefit more from this kind of group. This is because in a group of this kind, introverts are not trapped in their offline position and can recreate themselves. This is reinforced by the fact that introverts and neurotic individuals often feel they can express their "real selves" online especially in an anonymous environment [61].

Looking at both the “rich-get-richer” and “poor-get-richer” theories, it is clear that communication technologies offer social benefits to both introverts and extroverts [65,74]. By considering personality traits in the design of these platforms, social media can be a positive space for everyone, since it helps to foster social connections and build online communities [77].

Communication technologies can also promote e-empowerment in various aspects of life [78]. On a personal level, social media helps bridge cross-cultural boundaries, reduces stereotype use, and provides social compensation. At the group level, it enables individuals to connect with like-minded people, offering group reinforcement. Finally, at the citizenship level, social media facilitates political activism, allows individuals to influence government decisions, and provides access to government tools [78].

The internet also lets people explore interest-based knowledge, which can be inspiring, [79], and in addition it can boost self-awareness and provide affirmation [79]. This can of benefit, particularly to those people who feel subjectively or objectively inferior to others in the offline

5. Personality Traits and Transportation Technologies

Transportation technologies are tools for moving goods and people, from navigation systems and cars to emerging technologies like autonomous vehicles, drones, and urban air mobility [80,81]. The integration of AVs into transportation systems is a widely discussed topic [81]. Personality plays a significant role in attitudes toward adopting AVs. Schandl et al. [82] found that people with high anxiety, technophobia, and insecurity tend to be anxious about autonomous vehicles (AVs), while those with moderate technological competence are more open to adopting AVs, particularly personal cars. Mosaferchi et al. [83] also showed that individuals with high confidence and a strong affinity for technology are the most likely to embrace AVs.

Open individuals, driven by curiosity and sensation-seeking, are more likely to consider AV adoption [21,44,84]. However, Sela & Amichai-Hamburger [85] argue that sensation seekers may resist AVs, as they prefer maintaining control over driving intensity. Extraversion and conscientiousness are linked to lower eagerness to adopt AVs [84,85]. When designing AV technology for different personalities, extroverts have been found to benefit from features that enhance the social experience, allowing them to focus on conversations without the distraction of driving [30]. Whereas conscientious individuals would feel more at ease with regular updates and structured information about the AV's operation [30,86]. Neurotic individuals may need additional reassurances or features to address their discomfort with AV technology [30,85], while open individuals could be offered more control options, such as access to detailed information about the vehicle's functioning [86]. These personalized approaches could improve the overall adoption and comfort of AV technology.

 doi:10.20944/preprints202506.0662.v1

Beyond the Big Five traits, other personality theories may also influence individuals' willingness to adopt transportation technologies, though empirical research in this area remains limited. Based on personality theory analysis, Amichai-Hamburger et al. [30] concluded that certain traits affect AV attitudes. For instance, individuals with a high need for closure are more likely to prefer AVs that provide minimal information and limited control. In contrast, those with a low need for closure would want more options and greater control over the vehicle. Similarly, those with a low need for cognition prefer minimal interaction with the AV, whereas individuals with a high need for cognition enjoy acquiring more detailed information about the system. However, people high on the agreeableness trait may have concerns about ease of use and vehicle reliability [45,87]. In contrast, neuroticism is negatively associated with autonomous car acceptance [45,88].

Amichai-Hamburger et al. [30] also suggest that attachment style may influence AV attitudes. Secure individuals tend to be trusting and are less likely to fear driverless cars. Dismissive-avoidant individuals, who value self-sufficiency, may appreciate the sense of freedom and autonomy AVs can offer. In contrast, anxious-preoccupied individuals, prone to negative thinking, are most likely to fear AV technology. Fearful-avoidant individuals, however, may see AVs as a safe space for escape, making them more willing to adopt the technology.

Transportation technologies affect human wellbeing in various ways, both physically (e.g., traffic accidents, air pollution) and emotionally (e.g., travel satisfaction, access to activities) [89]. The impact of transportation technologies on wellbeing is especially significant for aging individuals. As people age and must stop driving in car-dependent societies, the available transportation options can significantly affect their wellbeing [90]. Studies show that satisfaction with transport systems strongly influences the physical and psychological wellbeing of older adults, as it enhances their sense of community [91]. Emerging technologies like autonomous vehicles (AVs) can help older adults maintain mobility by assisting with driving or acting as a chauffeur service. Such travel options enable them to stay socially connected, improving emotional wellbeing [90]. Given that elderly individuals often experience high levels of technophobia [92], AV design must prioritize comfort and trust through features such as accessible emergency support and calming in-car environments.

Transportation technologies affect the general population's wellbeing through various factors, including distance from public transport, wait times, trip duration, and maintenance. Drivers' satisfaction depends on road infrastructure, congestion, and parking availability [93]. Real-time information apps addressing wait times and parking particularly benefit those high in openness and low in need for closure. One study demonstrated that a simple road sign showing a smiling cyclist and passing car improved drivers' perceptions of road users [94]. This demonstrates how real-time information and behavioural cues can significantly impact human decision-making, attitudes, and efficiency.

6. Artificial Intelligence

Artificial intelligence (AI) refers to intelligent systems capable of adapting to their environment and solving problems with limited resources [95]. These systems perform tasks like learning, reasoning, language understanding, and visual perception [96]. AI has rapidly transformed multiple sectors, including education, healthcare, finance, and entertainment, fundamentally shaping our daily experiences. Research examining the Big Five personality traits has revealed complex relationships that influence user attitudes, adoption, and engagement with AI technologies, even as the field continues to evolve. Familiarity with AI influences trust and acceptance [24]. Riedl's [97] review of empirical research found that agreeableness, openness, and extraversion were positively correlated with AI trust, while conscientiousness showed mixed results. On the other hand, neuroticism was generally negatively associated with trust in AI.

Openness to experience and agreeableness are consistently linked to positive attitudes towards AI. Park and Woo [98] found that individuals high in openness tend to have positive emotions and view AI as socially engaging and functional. On the other hand, extroverts generally have more negative attitudes toward AI, likely due to their preference for human interaction and scepticism about AI's ability to provide meaningful social engagement [98].

Neurotic individuals demonstrate a complex relationship with AI: while expressing negative emotions toward its functionality, they view it positively regarding sociality, believing AI could fulfill their need for connection. Conscientiousness relates positively to evaluations of AI's functionality, as these individuals may view AI as a performance-enhancement tool. However, this is dependent on their level of interest in AI. Babiker et al. [99] found that agreeableness was correlated with positive attitudes toward AI, and neuroticism was negatively associated with such attitudes. Their study revealed cultural differences: conscientiousness correlated with negative attitudes toward AI in the UK sample but showed no correlation in the Arab sample.

Increased familiarity with technology is linked to higher levels of trust, implying that exposure and experience with AI can reduce initial scepticism [24]. Their study revealed cultural differences: conscientiousness correlated with negative attitudes toward AI in the UK sample but showed no correlation in the Arab sample.

An intriguing application of AI is in chatbot programs like ChatGPT, particularly in relation to cheating. The dark triad traits strongly predict this behaviour. Machiavellianism correlates with intentions to use chatbots for cheating, as these individuals' manipulative nature leads them to seek shortcuts [37]. Similarly, narcissists and psychopaths show higher likelihood of exploiting chatbot technology for personal gain, driven by self-focus and lack of empathy [37].

7. Medical Technologies

Medical technology encompasses the knowledge and tools that assist healthcare professionals, including pharmaceuticals, medical procedures, and devices like pacemakers [100,101]. While traditionally limited to medical professionals with extensive training, many medical innovations have evolved to become accessible to consumers through personal devices and applications. Technologies like health apps now enable individuals to monitor and learn about their health, including specialized applications for mental health support.

Individuals high in conscientiousness tend to prefer mental health apps that provide trusted information, suggestions, and encouragement, as they value features that enhance their effectiveness and competence [23]. In contrast, those high in neuroticism, marked by emotional instability, are drawn to apps offering relaxation exercises and social support [23]. Medical technology is typically driven by necessity rather than consumer desire, often associated with unpleasant contexts and strong emotions about personal health [102]. Understanding the impact of these devices on well-being is essential. Modern medical advancements like telemedicine have significantly improved patient well-being by providing convenient and accessible healthcare options [103].

8. AI, Medical Technologies and Well-Being

AI represents a transformative technology that affects human well-being through significant benefits and potential risks. While it drives economic and social change, AI also raises concerns about privacy invasion, job displacement, and increased surveillance. AI can potentially enhance well-being through applications that improve efficiency, personalization, and convenience. AI-driven technologies are transforming healthcare by enabling more accurate diagnoses, personalized treatment plans, and streamlined medical record management. Predictive analytics identify at-risk patients, enabling timely interventions and improving health outcomes. AI-powered chatbots and virtual health assistants provide 24/7 support, reducing the burden on healthcare professionals and enhancing patient access to care [104]. These tools can be tailored to different personality traits—offering reassurance to neurotic individuals or detailed information to those with a high need for cognition. This personalization can reduce healthcare-related anxieties [102], improving patient well-being. Recent research suggests that AI can infer personality traits through chatbot conversations [105,106], potentially helping predict subjective well-being [106].

 doi:10.20944/preprints202506.0662.v1

AI in mental health encompasses virtual therapy, apps, and diagnostic tools that detect early signs of mental health issues. These technologies increase accessibility and affordability of mental health support, particularly for those without access to traditional therapy [107]. An Oracle study [108] found that 82% of people believe robots can support mental health, indicating broad acceptance. Consulting psychologists can help tailor these tools to personality traits—providing trusted information for conscientious users and social support for neurotic individuals [23,105]. Salem et al. [109] found that nursing students high in openness were more likely to have positive attitudes toward AI technology. In contrast, those high in neuroticism and agreeableness felt less positive about these innovations, and students high in conscientiousness exhibited a clear negative attitude toward AI.

Achieving widespread AI acceptance requires consideration of different personality preferences and traits. Individuals high in openness and agreeableness tend to favour interactive and exploratory AI interfaces [21,22]. Highlighting AI's social benefits attracts extroverts [17], while designing AI to provide reassurance and foster social connectivity better suits neurotic individuals [102]. For technophobes, building trust requires user-friendly tutorials, clear communication, and trial periods to ease initial scepticism. Tailoring AI design to different personalities increases user satisfaction and encourages broader adoption.

9. Discussion

This paper highlights the crucial role of personality traits in shaping how individuals interact with and perceive technologies, particularly AI. Aligning technology with user traits fosters a supportive and effective environment, enhances user experience, and promotes overall wellbeing. Understanding user preferences and personality traits can guide technology developers and marketers in creating more user-centric products. Designing interfaces to match different personalities can boost satisfaction, engagement, and retention. This approach helps ensure that technology advancements are used optimally, improving the quality of life across diverse populations.

We can better design user-centric solutions by examining how different personality dimensions influence technology adoption. Understanding how the Big 5 personality traits— openness, conscientiousness, extraversion, agreeableness, and neuroticism—each impact the way in which users engage with AI, allows developers to create tailored experiences that improve satisfaction and usability. Building trust in AI through user-friendly designs is vital, especially for technophobes and those with anxious attachment [24].

There will be immense power in connecting AI with personality, effectively creating a digital identity for each individual. When combined with the Internet of Things (IoT), this integration will have the potential to orchestrate all digital channels and technologies, ensuring that interactions will be tailored to the user's personality in order to enhance their well-being. To better understand the significance of this transformation, below we envision two specific examples, the first from the field of healthcare, and the second from the field of transportation.

9.1. Healthcare

Integrating Artificial Intelligence (AI), personality knowledge, and IoT is expected to revolutionize healthcare. In this field, digital identity will translate personality traits into a personalized and adaptive healthcare system that will interact with devices and environments surrounding the staff and patients. These AI and IoT-driven systems will personalize healthcare by adapting digital environments to individual psychology, improving treatment adherence, preventive care, and recovery. They will also support mental well-being by reducing anxiety, boosting motivation, and fostering trust. Additionally, they will ease the burden on healthcare professionals by automating and personalizing patient interactions, making healthcare more efficient, engaging, and emotionally intelligent.

Through IoT, AI will extend beyond the traditional doctor-patient interaction, synchronizing with smart devices, wearables, virtual assistants, and home automation systems to create a dynamic

 doi:10.20944/preprints202506.0662.v1

and responsive medical ecosystem. Each individual's psychological profile will shape their interaction with medical information, course of treatment adherence, and environmental needs.

To promote effective recovery, the BIG5 model will help determine how the different personalities could benefit from different environments. For example, neurotic individuals could benefit from stress-reducing environments where smart home devices will be able to adjust lighting, sound, and notifications to minimize anxiety, whereas conscientious patients will likely engage better with structured digital reminders for medication, fitness, and diet management. Sensation-seeking individuals, who often struggle with routine treatments, could be supported by AI-based VR therapy, gamified health challenges, and interactive rehabilitation tools to maintain their engagement and prevent treatment dropout. Need for Closure theory will guide the way in which patients process medical information, ensuring that those requiring certainty will receive clear and structured health instructions via intelligent assistants. At the same time, those comfortable with ambiguity will engage better with interactive, AI-curated health content that will allow them to explore multiple options. Similarly, Need for Cognition theory will enable AI to adjust the depth of medical content, offering detailed reports and statistical analyses for individuals who prefer data-driven decision-making and concise, step-by-step guidance for those requiring simplified information.

Attachment Theory will further personalize healthcare interactions, ensuring that avoidant individuals who prefer minimal direct interaction with healthcare providers will have the option to rely on self-service AI-driven healthcare tools. In contrast, anxious patients will benefit from emotionally supportive digital interactions through virtual health check-ins.

By integrating biometric wearables, home automation, and AI-driven medical platforms, future digital healthcare systems can proactively enhance physical and mental well-being. Smartwatches and fitness trackers will be able to monitor stress, heart rate, and sleep patterns, triggering real-time adjustments in home environments, for example, by playing calming sounds to reduce stress levels. Smart home assistants, such as Alexa or Google Home, will provide personalized health coaching, medication reminders, and real-time health insights based on mood and personality traits. AI chatbots and virtual health assistants will adapt their communication styles based on personality, offering direct and structured advice for pragmatic users while providing empathetic and supportive guidance for those requiring reassurance. Additionally, IoT connected medical devices, such as smart glucose monitors, blood pressure cuffs, and medication dispensers, will adjust their feedback and alerts to match the patient's cognitive and emotional preferences.

9.2. Transportation

Transportation serves as another compelling example of the impact of integrating AI with personality. The "brain" of the Internet of Things (IoT) would play a fundamental role in shaping the various technologies that define the autonomous driving experience. This would enable a seamless connectivity between the vehicle and external systems, IoT facilitates real-time data exchange, enhances adaptive personalization, and optimizes the integration of AI-driven interfaces with user psychology.

The synergy between AI-driven dialogue and a deep understanding of personality can significantly enhance the psychological dimension of the user experience, making autonomous travel more intuitive, comfortable, and responsive to individual needs. The vehicle's interface, sensory experience, and interaction style must be tailored to the psychological comfort of each passenger, ensuring the journey is not just efficient but deeply personalized and emotionally intelligent. AI will dynamically adjust every aspect of the vehicle based on personality models, ensuring an optimal match between user traits and their in-car environment.

The Big Five personality traits will dictate the depth of interaction and level of customization. Neurotic individuals will benefit from low-stimulation environments, with gentle climate control, predictable acceleration and braking patterns, and notifications that are structured and clear to minimize uncertainty. Extraverts, on the other hand, will enjoy a highly interactive experience, with a conversational AI that facilitates social engagement, collaborative travel experiences, or even virtual meetups during the ride. Openness to experience will influence how much novelty the system introduces—passengers high in openness may receive exploratory route suggestions, adaptive ambient lighting that changes with scenery, and AI-curated experiences such as music or podcasts aligned with their evolving preferences. Those low in openness will prefer a simplified, no-surprises journey, where efficiency is prioritized, and unnecessary suggestions are filtered out. Conscientious users will appreciate a structured dashboard UI offering detailed trip analytics, fuel efficiency reports, and real-time monitoring of the vehicle's AI-driven decisions, ensuring everything is running at peak performance. Agreeable passengers will enjoy a socially harmonious space, where AI optimizes shared passenger preferences, mediates ride-sharing experiences, and even recommends entertainment that suits the collective mood. A neurotic passenger, for example, may find a softly lit, quiet cabin with warm ambient tones, subtle fragrance diffusers, and an AI assistant that speaks in a calm, reassuring manner, providing structured updates and predictive explanations of every turn and stop to enhance their sense of control. A high-sensation seeker, in contrast, might enter a dynamic, immersive environment with an interactive AR-enhanced windshield, spontaneous route suggestions based on nearby attractions, an infotainment system that encourages engagement, and an AI voice that feels more energetic, playful, and exploratory.

The Need for Closure (NFC) will determine the structure of the travel experience. High-NFC individuals require rigid, pre-planned routes, scheduled stops, and minimal deviation, with their dashboard interface displaying a clear itinerary, expected traffic conditions, and contingency plans. Their AI assistant will provide step-by-step confirmations, ensuring predictability. The climate control system will maintain a stable environment, avoiding abrupt temperature shifts that could create discomfort. In contrast, low-NFC passengers will thrive in a fluid, flexible system, where the AI dynamically adjusts the route based on traffic, weather, or serendipitous detour recommendations. Their dashboard might be more interactive, providing real-time exploratory suggestions, such as scenic views, pop-up cultural experiences, or even adaptive infotainment tailored to their interests.

Need for Cognition (NFCg) will dictate the level of complexity in the dashboard interface and AI communication style. High-NFCg users will have access to in-depth analytics, displaying real-time energy consumption, AI decision-making rationales, and predictive performance tracking. Their AR windshields may provide layered navigation overlays, featuring historical insights on locations or detailed environmental data. In contrast, low-NFCg individuals will prefer a simplified interface, where AI makes most decisions autonomously, minimizing cognitive effort and allowing the passenger to simply enjoy the ride without overwhelming information.

Sensation Seeking will shape the level of engagement and sensory stimulation within the vehicle. High-sensation seekers will experience a more immersive, dynamic infotainment system, featuring interactive AR-enhanced navigation, VR entertainment, and gamified driving experiences, even in a self-driving setting. Their AI assistant may suggest unconventional routes, adventure-based stops, or interactive challenges throughout the journey. They may even prefer haptic feedback seating, which mimics road textures to maintain an active connection to the driving experience. Low-sensation seekers, however, will benefit from a quiet, stable interior, with soundproofing, dimmable ambient lighting, and an infotainment system that focuses on relaxation, meditation, or seamless passive engagement.

Attachment Theory will also influence the way AI interacts with passengers. Anxiously attached individuals will need frequent reassurance, with proactive safety updates, emotional affirmation from AI, and structured trip confirmations that provide a sense of predictability and security. Their dashboard may display a visualized safety status, along with automated calming interventions such as guided breathing exercises or AI-generated mood-supportive music playlists. Avoidantly attached passengers, in contrast, will prefer a minimalist AI presence, where interactions are kept to a bare minimum, notifications are infrequent, and system autonomy is maximized. Their vehicle will operate in "silent mode," limiting AI engagement unless a major decision requires their input.

Securely attached passengers will receive a balanced AI dynamic, where the system can oscillate between active and passive engagement based on contextual cues.

In addition, IoT connectivity will allow seamless integration between the vehicle and the passenger's broader digital ecosystem. Wearables and biometric sensors will provide real-time stress analysis, allowing cabin conditions to adapt dynamically, ensuring the passenger remains comfortable and engaged. Personalized infotainment will sync across devices, curating content in alignment with cognitive states. AI-driven mood tracking will allow predictive emotional adaptations, ensuring that passengers remain relaxed, engaged, or entertained based on their moment-to-moment needs. For those returning home, the vehicle will communicate with smart home systems, adjusting climate and lighting to create a smooth transition upon arrival.

These are examples of how the integration of AI and personality knowledge can serve human well-being. Similar applications could emerge across many other fields, from education to workplace optimization. It is vital, however, to acknowledge the risk that these technologies pose, as they could be utilised to manipulate rather than empower individuals.

10. Last Words

These advancements raise serious ethical concerns. While AI and IoT could greatly enhance well-being, they also create the risk of mass data collection, manipulation, and loss of individual autonomy. With the ability to analyze, predict, and influence human behavior, AI-driven personalization could evolve into a powerful control tool, allowing governments, corporations, or other entities to subtly shape decisions, behaviors, and even thoughts. The danger of an "Orwellian" reality, where AI and IoT do not serve humanity but rather govern it through surveillance and behavioral nudging, is a real danger. To prevent a future where personal freedom is compromised, it is essential to implement strict regulations, transparency standards, and independent oversight. Without robust legal and ethical frameworks, these technologies could shift from enhancing human autonomy to undermining it. Therefore, it is imperative to prioritize privacy, security, and digital rights before AI and IoT become all-encompassing forces of influence.

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