International Journal of Cyber Behavior, Psychology and Learning
Volume 14 • Issue 1

Cognitive Performance in the Digital Era:
Generational Differences, Stress, and Distraction's Impact on Cognitive Performance

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ABSTRACT

Generational categories classify individuals born in specific time frames, known for unique traits and tech adaptability. Some research indicates that the digital-native generation is more prone to distractions than other groups. However, the underlying mechanism is unclear and influenced by many factors, such as stress. In the current study (n=299), the authors leveraged the mobile monitoring of cognitive change (M2C2) symbol search task to measure processing speed. This study examines the relationships between generational categories (Gen X, Millennials, and Gen Z), perceived stress, subjective age (considered to predict important aspects of well-being beyond chronological age), and distraction cost. These results emphasize the significant influence of age-related variables and stress in shaping susceptibility to distractions. Future research can expand participant numbers, conduct longitudinal studies to track cognitive changes in digital-era generational cohorts, and explore neurocognitive mechanisms and technological fluency's role in distraction susceptibility.

KEYWORDS

cognitive, digital, distraction cost, Gen X, Gen Z, Millennials, stress, subjective age

INTRODUCTION

Generational thinking – comparing cohorts based on ranges of year of birth – implicitly assumes that individuals born within the same timeframe or generational cohorts tend to share common values and characteristics, such as beliefs, motivations, values, and behaviors, that set them apart from individuals born in different eras (Mitchell, 2003). As people are born between specific years, generations are frequently described by labels (Raphelson, 2014). There are several general categories, such as Baby Boomers (born between 1946 and 1964), Generation X (born between 1965 and 1980), the Millennial generation (born between 1981 and 1996), and Generation Z (born in 1997 onward) (Pew Research Center, 2018).

In terms of engagement with technology, Gen X (and generations that preceded them) were not born into the digital world but adopted and adapted to new technologies later in life. These individuals

DOI: 10.4018/IJCBPL.341788 *Corresponding Author

did not have the privilege of growing up with technology as an inherent and integral aspect of their formative years. Instead, they have acquired technological proficiency during adulthood and late adulthood, in the case of Baby Boomers (Prensky, 2001). Members of Gen X did not have cell phones when they were growing up, took longer to adopt new technologies, experienced greater anxiety when using them, and used fewer different types of technologies (Volkom et al., 2014; Zickuhr & Madden, 2012; Olson et al., 2011). According to Calvo-Porral & Pesqueira-Sanchez (2019), Generation Xers' motivations for information searches impact their use and interaction with technology.

Millennials were the first generation to have computers in their schools, and they became adults when the internet became widely used and tried to adapt to many forms of digital technology and social media. Their generation could be called "digital natives" (Prensky, 2001; Palfrey & Gasser, 2013). Compared with Generation X, Millennials perceive information and communication technologies more positively (Howe & Strauss, 2003). They incorporate technology into their daily lives to stay connected to social networks, creating, and sharing information on their blogs or social media (Hershatter & Epstein, 2010; Noble et al., 2009). Additionally, some Millennials have acquired the multitasking skills necessary to balance their personal lives, careers, and online communication. They can work, study, and engage in online social networking simultaneously.

The next younger generation is Gen Z – individuals who grew up with mobile devices as a central aspect of their lives and have been exposed to technology from a very young age, making them true digital natives (Schroth, 2019). Compared to Millennials, Gen Z started connecting to the internet earlier, with smartphones as one of their first displays, making them a generation primarily focused on mobile devices. Gen Z individuals maintain a perpetual state of connectivity and prefer communication through technology, prioritizing digital interactions over face-to-face encounters. This characteristic reflects their inclination toward digital communication channels and their comfort with technology as a primary mode of engagement (Poláková & Klimova, 2019).

Each generation may have distinct online communication and interaction preferences. Younger generations, for example, may prefer text-based communication and social media platforms, whereas older generations may prefer email and phone calls. In general, younger generations are more technologically literate and accustomed, while older generations might take longer to become accustomed to and proficient in using new digital platforms and may have acquired digital skills through training. Older generations can overcome digital barriers and enhance their digital literacy and proficiency through various strategies, such as seeking help from tech-savvy friends and family, attending workshops, and practicing regularly. It is important to recognize that differences in technological comfort and competence can influence screen time usage patterns, resulting in various effects on various cognitive domains.

Screen Time, Cost of Distraction, and Processing Speed

"Screen time" refers to how much time a person spends interacting with screens, including those on televisions, computers, laptops, smartphones, tablets, and other digital devices. Screen time usage varies across age categories, with distinct patterns emerging among generations. Generation Z and Millennials have seamlessly integrated technology into their daily lives. They are known for their extensive use of digital devices, including smartphones, tablets, and computers, and are highly engaged with various forms of social media and apps (Shatto & Erwin, 2017). This tech-savvy behavior has led to a preference for multitasking and the ability to effortlessly switch between activities like instant messaging, web browsing, and gaming on their devices (Foehr, 2006). However, this convenience also comes with the challenge of constant digital distractions, making it difficult for these generations to sustain long-term concentration on a single task (Rosen, 2017). In contrast, older generations may exhibit more moderate screen time habits, emphasizing traditional communication methods like email and phone calls.

In the mobile world, individuals may experience "serial digital distraction" as they attempt to process the massive bits cascading to them. The constant distraction from digital devices will