Exploitation-Exploration Model of Media Multitasking (EEMM)

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Background

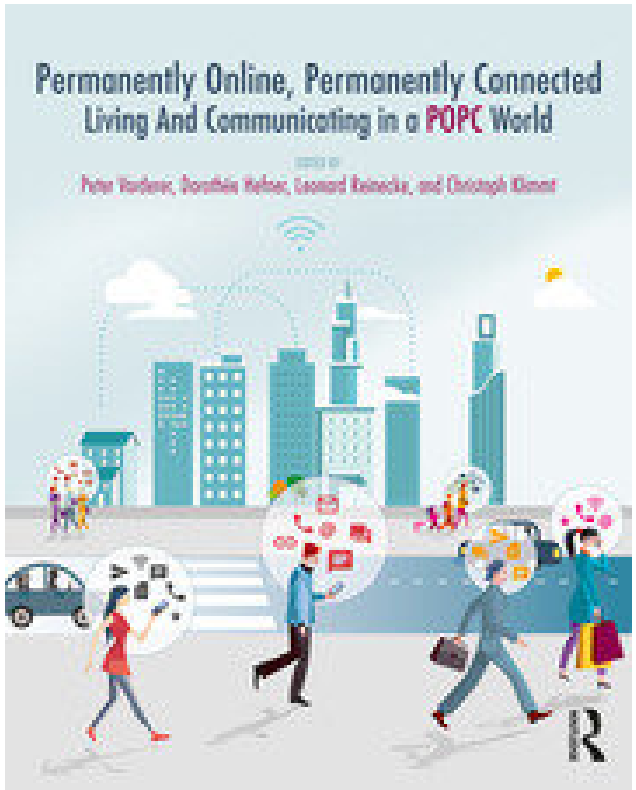
The 2022 China Mobile Internet Annual Report released by QuestMobile, shows that the scale of China's mobile Internet users exceeded the 1.2 billion mark in 2022, while user stickiness also grew further, with the monthly per capita time and number of times of use exceeding 177.3 hours and 2,633 times, respectively.

Mobile Internet technology is increasingly deeply embedded in people's daily life, changing the habits and ways of interaction. At the same time, the continuous popularization of mobile Internet technology and permanent availability enables people to access content that seems to be independent of time and space, a new media usage pattern called "permanently online, permanently connected(POPC)" by Zhou (2020), and has attracted the attention of communication scholars.

Background

POPC means a turning point in the basic presupposition of *media use*, an important concept in media effect research: *media use* in the past often meant the use of media content at a specific time and space, with complete and independent process, which is related to the technological affordances of traditional media. The technical form of new media breaks this presupposition and presents a state of *flow* of continuous use. In terms of micro-concept definition at the audience level, media use used to be equated with media exposure and media selectivity. In the Internet era, a considerable part of the media use research is named *Internet Use* or *Mobile Internet Use* to examine the frequency, duration, form and content of the audience's use of the Internet and mobile Internet. On the other hand, media use research is becoming more and more diversified or diversified; researchers integrate various media forms and contents to examine audiences' media use in different times and spaces. Among them, **media multitasking** is one trend worth noting.

Background



Vorderer, P., Hefner, D., Reinecke, L., & Klimmt, C. (Eds.). (2017). Permanently online, permanently connected: Living and communicating in a POPC world. Routledge.

Introduction

Media multitasking generally refers to the phenomenon of people being exposed to or using more than one medium at the same time. In an era where the audience is in a state of continuous contact and media saturation and convergent technologies are rapidly developing, this behavior is becoming more and more common and gradually attracts the attention of academic circles. The term "multitasking" was originally used to describe the parallel processing capabilities of computers, and was later used by cognitive psychologists to describe human attention being dispersed among multiple behaviors or situations at the same time. It has now become an expression of human beings' attempts to accomplish more things simultaneously and quickly as possible, and to coordinate more technical forces as best as possible. It has attracted widespread attention in the fields of communication research, social sciences, and even natural sciences and engineering.

Resources Theories

- Central bottleneck theories posit structural limitations in underlying cognitive systems as the primary reason for detriments to performance (Marois Ivanoff, 2005). These theories argue that human cognition is directed by a mechanism that sequentially processes stimuli that require attention (Levy Pashler, 2008). This suggests that the limitations of information processing during multitasking are primarily attributable to structural limitations. Because only one task can be processed at a given moment, simultaneous requests for mental resources result in deleterious effects on cognitive processes. This view has provided a parsimonious account of many empirical findings, including the Psychological Refractory Paradigm (PRP) and attentional blinks studies (e.g., Marois Ivanoff, 2005).

Resources Theories

- Theories of limited capacity or resource provide an alternative view of limitations in human information processing and cognitive functions (Kahneman, 1973). Capacity is conceptualized as energy required for the completion of any given task, such as encoding, storing, and retrieving information (Lang, 2000, 2006). Decreases in performance are expected when the mental capacity required for two tasks exceeds the totalamountofcapacityavail-able.Fromthisview,multitaskingperformanceisprimarily limited by available capacity, rather than a cognitive structure that excludes the possibility of parallel processing. In other words, it is possible for the cognitive system to perform multiple tasks in parallel if capacity is sufficient. In addition, individuals with higher capacities may handle the same multitasking behaviors more easily and successfully, and thus be more likely to multitask.

Resources Theories

- Multiple resources theories are a variant of the limited capacity theories.They argue that the cognitive system has multiple pools of mental resources that may be used in completing a given task or multiple tasks (Basil, 1994; Wickens, 2002). These different pools are typically associated with specific modalities of information (Basil, 1994; Salvucci & Taatgen, 2008). For example, there is a resource pool dedicated to the processing of visual information and a separate resource pool dedicated to the processing of auditory information. Each of these pools has limitations affecting the amount of information that can be processed at a given moment. Resources can be allocated both intentionally and automatically (and sometimes unconsciously) depending on features of the stimuli and the goals or motivations of individuals (Lang, 2006; Shiffrin & Schneider, 1977). For example, media psychological research has established that characteristics of media production and content can elicit allocation of mental resources to processing the media automatically.

Resources Theories

- Probably because mental resources are limited, scholars have observed that humans tend to avoid cognitively demanding tasks, which has been coined "the law of less work" (Allport, 1954; Hull, 1943; Kool et al., 2010), and to conserve resources (Hobfoll, 1989; Muraven & Baumeister, 2000). In fact, as Allport argued more than half a century ago, effort, except when we are highly motivated, is "disagreeable" (p. 21). Indeed, neuroscientific evidence suggests that cognitive effort elicits aversive responses in humans. Research has found that human nucleus accumbens' (NAcc) responses increase when the reward value of a task increases, but decrease when the associated cognitive demand of the task increases, suggesting that cognitive effort has a reward discounting effect (Botvinick, Huffstetler, & McGuire, 2009).

Reciprocal Dynamics of Media Multitasking

Uses and Gratification

At the center of the U&G approach are the various needs of media users. Needs are "the combined product of psychological dispositions, sociological factors, and environmental conditions" (Katz et al., 1973, pp. 516–517) that motivate media consumption or exposure. Gratifications are the "perceived fulfillment" of the needs through media use (Palmgreen, 1984, p. 22).

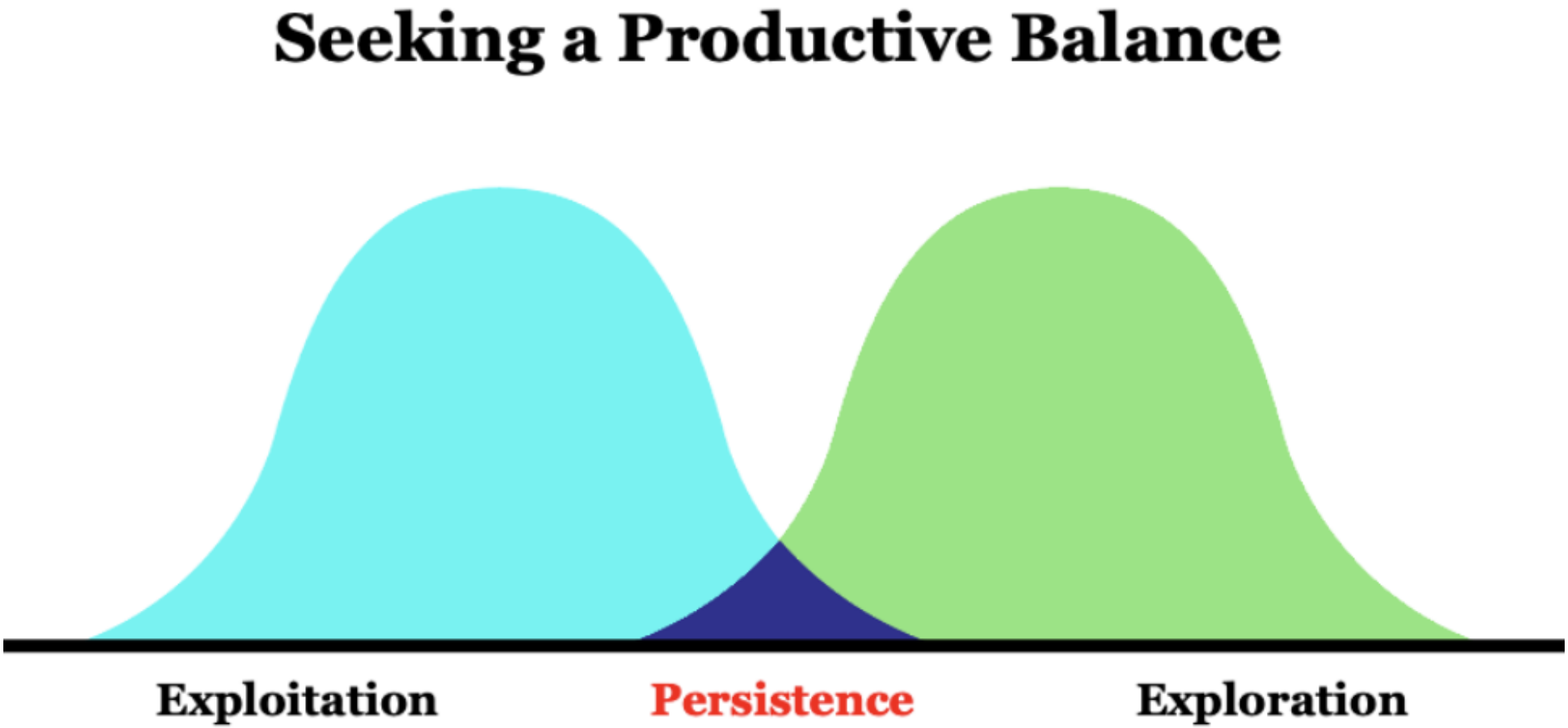
Formalized model

To test the dynamic relationship between media multitasking, underlying motivation (as specified by four categories of needs), and corresponding gratifications, research formalize our hypotheses using dynamic panel models (Baltagi, 2008).

Exploitation-Exploration Model

Dynamic motivated choice perspective is widely em- ployed to explore this question and incorporates many relevant factors, such as the type of media technology, geographical information of users, the type of interac- tion between technology and people, etc. Wiradhany et al. (2021)introduces the exploitation-exploration model of media multitasking(EEMMM), using task engagement to develop the model and showing why people media multitask spontaneously. From U&G theoretical opinion, Wang and Tchernev (2012) provides evidence of the re- ciprocal dynamics of media multitasking, personal needs, and gratification using time-series data

Exploitation-Exploration Model of Media Multitasking



After reviewing existing research, multiple factors are considered and involved in the model, as Table 1 shows. This research tend to draw the perspective of dynamic choice and consider multiple factors to observe the gen- eral patterns of emergence of media multitasking, in other words, equilibrium state of multitasking and boundary conditions under different circumstances

Factors

	Type	Factors	Reference
media	technology and interaction based	affordance	Zhou 2020
		information flow	Baumgartner and Wiradhany 2022
		shared modality	
		task switching	
		instant gratification	
		behavioral response requirement	
audience	socio-geographic	gender	Alghamdi et al. 2020
		age	Carrier et al. 2009
	individual-level	personality traits	Wang and Tchernev 2012
		needs	
		social capital	Huber et al. 2019

Table 1: Factors and References

Process

- When primary task engagement (utilization) begins to wane, alternative task engagement decreases. Missions become more engaging (exploration).
- Adaptable combination according to media cognitive dimensions, plus emotional satisfaction part
- Cognitive Choice Modeling: quantum walk model

Outcome and Effects

- working memory capacity
- study and work performance
- socioemotional functioning
- well-being
- ability of multitasking

Thanks for your listening! CONTACT:liuruomeng[AT]ucass.edu.cn