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Individual differences in dealing with overflow

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ABSTRACT

Understanding factors limiting the effectiveness of multitasking and increasing the risks of experiencing overflow by individuals engaged in multitasking are important challenges for management sciences and may help with the reduction of psychosomatic costs incurred by employees. The analyses presented in this paper focus on reactivity and multitasking as risk factors for overflow, and on individual differences in dealing with overflow, resulting from an interaction of reactivity and point or interval activity styles. Activity style may be either congruent or incongruent with the temperament. Undertaking activities in accordance with temperament is psychologically rewarding, but undertaking activities mismatched with the temperament, if they are consistent with the expectations of important others, may also be equally beneficial. Individuals with low-energy resources, who engage in multitasking, must deal with a mismatch of the activity style and the capabilities of the body—often resulting in an overflow.

1. Introduction

The phenomenon of overflow—an excess of information, tasks, objects or any other entities—is studied in the context of both individuals and institutions who have to deal with those on a daily basis. Overflow is perceived in both negative and positive meanings. Flood of information or excessive and misused tax money (Czarniawska, Solli, & Donatella, 2013) are examples of the negative face of the excess. Abundance is also studied in positive context, e.g. finding out ways to capture abundant natural energy from the sun or even from an ambient electromagnetic wave noise generated by consumer electronics (Almoneef & Ramahi, 2015) or extracting knowledge from digital and analogue data sources (Lofgren, 2013; Fellman & Popp, 2013).

Overflow has been extensively studied from sociological, economic and historical perspectives. In this paper, overflow is investigated in relation to personality characteristics and cognitive functioning of an individual. Information workers spend between 30% and 60% of their time merely searching and processing information for later use. Most of the information used by companies is difficult to index and store efficiently—from the point of view of its future on-demand availability—without pursuing again time-consuming searches. It is estimated that no more than 20% of all business information is easily searchable (Pijpers, 2010). This should not be surprising, considering the fact that people mostly deal with image and text-based information, and computer systems are most efficient with processing numbers. The vast majority of textual and pictorial information is barely reusable simply because no machine can understand its contents. Recent developments in the area of machine learning and deep neural networks give hope for increasing the accessibility of these types of information (e.g. Jozefowicz, Vinyals, Schuster, Shazeer, & Wu, 2016).

People invented a variety of tools to manage physical and digital overflow such as barcodes to manage inventories, registration plates to manage vehicles on public roads or secure delegated authentication (OAuth), which allows logging into multiple services with a common authentication system, e.g. Google or Facebook account (Ovadia, 2010). Regardless of these external tools, people use cognitive tools to manage overflows, such as ignoring distracting stimuli or attempting to deal with several tasks in parallel, i.e. multitask. Neither of these cognitive tools is void of cost. Ignoring stimuli irrelevant to the current task requires cognitive effort and has been shown to fail under cognitive load (Foster & Lavie, 2007). Multitasking, on the surface, appears to reduce information overload by providing means to complete more tasks in a shorter time. It has been shown, however, that heavy multitasking reduces the ability to filter out distractors, resulting in worse task performance scores (Ophir, Nass, & Wagner, 2009). Related research track (Burke, Hornof, Nilsen, & Gorman, 2005) has shown that banner ads can be ignored by individuals but at a cost of

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increase in perceived workload.

An overflow of people, goods and information makes the ability to categorise priceless. Multitasking, or switching one's attention among several different activities, has become an increasingly integral aspect of almost all jobs. Employers seek workers who can juggle tasks and work on several projects at the same time. Multitasking, and frequent attention switching, may not always be more efficient than working on tasks sequentially. Some individuals may be better suited for jobs involving concurrently pursuing several tasks (Girgis, 2010).

Individual characteristics, both temperamental and cognitive, play an important role in multitasking behaviour (Mark, Iqbal, Czerwinski, Johns, & Sano, 2016). Among temperamental traits, neuroticism and reactivity are perceived as important correlates of multitasking. There is also evidence that cognitive capabilities influence the frequency of switching tasks: in an environment, full of frequent distractors, and information overflow, it takes an effort to ignore these distractors (Ophir et al., 2009) and continue pursuing a single task. Among cognitive characteristics, scholastic aptitude and working memory have been shown to predict multitasking ability (Morgan et al., 2013).

In some contexts, multitasking may be considered either a negative or a performance-neutral characteristic rather than a positive aspect of one's performance. In their in situ study, Mark et al. (2016) suggested that a trait of distractibility, resulting from a lack of control, makes people working online susceptible to distractions and showed that shorter duration of focus is correlated with lower productivity.

In a 2008 study, Gloria Mark (Mark, Gudith, & Klocke, 2008, p. 107) investigated a disruption cost of interruptions on performance. The study shows that neither the interruptions nor the context of interruptions influence the time and quality of the work performed. Contrary to expectations, interrupted individuals completed their work faster, with no difference in quality (however, with a difference in the length of the email message, which was the outcome of the test task). Authors show that individuals manage the interruptions within the cognitive resources available to each person, taking into account individual differences. Two personality traits, namely higher openness to experience and higher need for personal structure, decrease the time needed to complete an interrupted task. Authors suggest that even though there was no time difference in the outcomes, the subjects bore cognitive costs of managing the interruptions.

Hall (1959), in studies of culture, has introduced a distinction between actual behaviour (multitasking) and preference for the behaviour (polychronicity). The original definition of polychronicity comprised two components: the preference for multitasking and the belief that multitasking is the best way to get things done. The most recent definition of polychronicity (Poposki & Oswald, 2010) describes polychronicity as an individual difference and restricts the construct to individual's preference for shifting attention among active tasks rather than completing one task and then switching to another. (Sanderson, 2012).

Multitasking increases the use of cognitive and energetic resources by an individual. Individual differences in multitasking abilities should also be linked with another personality trait, reactivity, which determines the strength of an individual's reaction to a given stimulus and thus reflects the cost of coping with the stimulation. Carrying out several tasks at once provides stronger stimulation than performing them sequentially.

Other personal characteristics, such as gender, were also studied in the context of polychronicity, multitasking and overflow. Karen Korabik, van Rhijn, Ayman, Lero, & Hammer (2016) argues, based on the results of a research with 533 American and Canadian employed parents, that while women score higher on the 'family overload' scale, there were no differences between genders with regard to polychronicity.

2. Theoretical background

In this text I analyse, from a theoretical and empirical perspective, individual differences in coping with excess. The starting point is the concept of **point and interval activity style**, proposed by Wieczorkowska-Siarkiewicz (1992), Wieczorkowska-Nejtardt (1998) and Wieczorkowska and Burnstein (1999).

Choices in everyday life, in any domain, such as choosing a mobile phone or a career path, require an individual to categorise available options into three subsets: (1) acceptable options, (2) unacceptable options to reject and (3) options one is indifferent to or which are ambivalent. The first category is called an acceptance zone (Beach, 1993). When an intention to act appears, the *acceptance zone* is automatically converted into a *goal-category*. Individuals categorise available options based on their descriptive (e.g. heavy, easy and difficult) and evaluative (e.g. pleasant, attractive and disgusting) properties. Many studies have shown individual differences in the size of the created descriptive categories (e.g. Pettigrew's category width – see Pettigrew, 1982). The descriptive categories may vary in size, depending on how much attention one pays to details. If we do not see the subtle differences in available phone brands, we evaluate them as equally desirable, although objectively they are different. Evaluative categorisation may cause options with very different descriptive properties to end up in the same category (Turska, 2016). As people categorise objects, they can also categorise plans and future activities, which can be considered a set of options. Individuals differ in the width of the acceptance zone for planning their future activities. For example, if one plans winter holidays with family, one may think of only a single preferred place to go (e.g. ski resort). For others, the area of acceptance might contain several choices such as skiing, thermal pools, or visiting relatives at the seaside. Each activity should theoretically have a specific vision of a state (result), which allows determining when a person can consider the task done. However, people differ with regard to how precisely this vision is cognitively represented. For those, who tend to formulate their goals in the form of clearly defined tasks, the vision is usually also clearly defined, e.g. for a writer, 'to write 5 pages today'. The end-point vision may also be defined in a fuzzy way, e.g. 'write as much as I can manage today'.

The size of the acceptance zone can be analysed not only in the context of evaluation of a given set (e.g. choose a meal in the restaurant, buy a product) but also in the evaluation of 'generative' choices (e.g. cook a meal, create a business-plan for a company). The choice category (subset of acceptance zone) might have a single ideal option (e.g. the business plan must concern creating a fitness club) or several equally acceptable solutions (e.g. three business plans of creating a restaurant, a fitness club, or a spa in the mountains).

Our cognitive resources are limited; therefore, **the broader the acceptance zone, the less is the cognitive space** left for the representation of the goal and for planning how to achieve it. At the same time, no matter how many options individual finds acceptable, typically only one will be chosen and acted upon (e.g. one might find two extremely interesting choices of an apartment to buy but will buy only one apartment).

The size of an acceptance zone (or goal-category) has several implications. The broader the acceptance zone,

- the bigger is the number of comparisons that must be made to choose the best option;

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