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NUDGING IN THE WORKPLACE: MOVING BEYOND THE TRADITIONAL MANAGEMENT TOOLBOX

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Purpose: The purpose of the paper is to establish how nudging can be used to influence workplace behaviour: what behaviours at work nudges are targeted at, what types of nudges are used and what are the factors that affect effectiveness of nudges applied in the workplace, i.e. is nudging in the workplace any different than nudging people's domestic and private lives.
Design/methodology/approach: A systematic literature review has been conducted in line with the PRISMA guidelines using Web of Science and Scopus databases.
Findings: When nudges are implemented in the corporate context they are frequently used to: improve employees' health and wellbeing, improve employees' communication and performance, ensure safety culture at work, and promote pro-environmental behaviours. The following nudges are discussed as the most promising for managerial applications: descriptive social norms to encourage employees to knowledge sharing and re-use, reminders - to reduce sedentary behaviour in the workplace or ensure safety culture at work, and defaults in corporate conservation programmes. Starting dispositions of individuals (employees), situational factors and cultural variations are identified as the three factors affecting the effectiveness of nudges in a workplace.
Originality/value: The paper provides a literature review which evaluates the state of knowledge on nudging in the workplace, indicates management implications when and how nudges can be applied to influence work behaviour and outlines promising avenues for future research.

Keywords: nudging, behavioural science, workplace nudging, workplace management, change management.

Category of the paper: Literature review.

1. Introduction

It is one thing to make a decision, and it is another to implement it within the organisation. There is a variety of management tools to do so. One of the less obvious is nudging. It might be particularly relevant for fostering safety culture or reducing impact of a company on environment by e.g. lowering energy consumption.

In recent years nudging has gained traction and is increasingly incorporated into public policy around the world to help achieve policy goals (Beshears, Kosowski, 2020). Literature is full of success stories of applying nudges to change behaviour in a wide range of domains: e.g. education (Weijers, 2021), public health (Ledderer et al., 2020), or promoting pro-environmental practices (Wee et al., 2021). No wonder that private sector managers have become interested in using this approach to pursue commercial and marketing goals (Caldwell, 2018). However, nudging inside companies is still an emerging research topic (Stieler, Henike, 2022; Rauscher, Zielke, 2019; Ruehle 2019). Literature review on nudging in the workplace or other third-party environments are hard to be find. Exemptions relate to eating behaviour in the workplace (Allan et al., 2017), promotion psychical activity and wellbeing of employees (Forberger et al., 2022; Colenberg, Jylhä, 2022) and saving energy in the workplace (Staddon et al., 2016), and is mainly conducted for other than managerial purposes. Thus, this paper aims to fill the gap and review the state of the art of applying nudges in the workplace, identify opportunities and challenges of nudging application when private organisations play a role of nudging agents. Of special interest is the question - is nudging in the workplace any different than nudging people's domestic and private lives.

A systematic literature review has been conducted in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). A total of 54 eligible studies were identified from acknowledged databases: Web of Science (WOS) and SCOPUS. The review has been guided by the following research questions: (1) What behaviours at work nudges are targeted at?, (2)What types of nudges are used?, and (3) What are the factors that affect their effectiveness?

The article is structured as follows. Following an introduction, the idea behind nudging is explained, i.e. how nudges differ from the traditional management tools. The next section contains the research methodology used in the review. Then, the results of the review are presented. Finally, we conclude by indicating management implications when and how nudges can be applied to influence work behaviour and outlining promising avenues for future research.

2. Nudging as a management tool

The nudging approach in public policy was widely embraced thanks to the work of Thaler and Sunstein (2008) "Nudge: Improving decisions about health, wealth, and happiness". The authors claimed that small changes made in the environment in which individuals make decisions can effectively alters people behaviour in a predictable way at a relatively low cost. Such a modification in "choice architecture" may entail changing the language used to describe the available options, the format in which the options are presented, or the process by which the options are selected. However, to qualify as "nudges," these strategies cannot mandate or forbid options, nor meaningfully change the economic incentives attached to them (Beshears, Kosowsky, 2020).

Nevertheless, the underpinnings of the nudging approach can be traced back to work of such behavioural economists as Herbert Simon (1955, 1957) on bounded rationality or Daniel Kahneman and Amos Tversky (1974, 1979, Kahneman 2011) on cognitive biases and heuristics. Simon proposed the concept of bounded rationality according to which individuals satisfice, (this is an amalgamation of the words satisfy and suffice), rather than maximise due to their limited cognitive and information-processing abilities, time constraints and incomplete knowledge. For that reason, they are not able to evaluate all potential alternatives and their consequences. They limit they search to only a few options to make decisions that are 'good enough' to meet their aspiration level. Thus, he departed from the assumptions of perfect rationality and homo economicus. Furthermore, against this backdrop, he demonstrated how organisations influence individual decision-making by assigning roles, channeling attention of the decision-maker, establishing operating rules and communication mechanisms, so individual actors become parts of a collective endeavour to achieve organizational goals (Schwarz et al., 2022). However, not only individuals face limitations on their ability to process information but decision-making differs under conditions of uncertainty and/or risk, because people react in such situations at the level of cognitive assessment as well as a level of emotional reaction (Tversky, Kahneman, 1974). This research direction has provided a deeper understanding of how people, in fact, think, choose, act and interact, frequently deviating from normative theories of rational choice. These deviations are referred to in the literature as 'cognitive biases. Two discoveries of cognitive psychology are particularly relevant from the point of view of the topic of this article. First, it is Dual Process Theory (DPT) (Kahneman, 2011), which posits that on a daily basis people use two systems of thinking. System 1 means quick, intuitive thinking. It works automatically, with minimal cognitive effort and basically without our conscious control. This system is based on mental shortcuts, the so-called heuristics. They save time, energy and attention. However, they come at a price - they are inaccurate and can lead to errors. System 2, in turn, involves slow, reflective thinking. It allows to make more informed decisions, but requires effort and focus of attention. These two systems work interchangeably.

While making decisions every day, human mind is constantly faced with the choice - saving time and energy, or greater precision. The second important discovery of cognitive psychology is that human failures in decision making are systematic, i.e. people in their limited rationality are quite predictable (Olejniczak, Śliwowski, 2014). And exactly on these premises the nudging approach is based. It differs from traditional policy and management tools in that it takes account of human cognitive biases and is designed to capitalise on them in order to increase the impact of policy and management tools. On the other hand, however, nudges differ from marketing 'tricks' in the intention behind their design. Nudges are considered as libertarian paternalism. 'Libertarian' as alternative options are still attainable, 'paternalism' as it is based on the idea that certain choices are better than others to improve well-being in the long run. Hence, one of the underlying assumptions of nudging is that people are basically in agreement with the goals pursued by the nudge interventions (Venema, Van Gestel, 2021).

3. Methods

The following research questions were raised to identify state of the art of the application of nudging in the workplace:

RQ1: What behaviours at work nudges are targeted at?

RQ2: What types of nudges are used to influence work behaviour?

RQ3: What are the factors that affect effectiveness of nudges applied in the workplace?

To address above research questions, the systematic literature review has been conducted in line with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The PRISMA checklist and the diagram ensure the transparency of the review process by depicting the flow of information through the different phases of the review process, mapping out the number of records identified and excluded, along with the reasons for exclusions (Page et al., 2021).With regard to data collection – two acknowledged electronic databases were used, namely: Web of Science and Scopus (Sánchez-Camacho et. al., 2022; Wee et al., 2021). The following search string was defined: (nudg* OR "choice architecture" OR "behavio?ral insights") AND (employee? OR workplace OR oragni?ation), within the fields: article title, abstract and key words. The research yielded 333 records.

The inclusion and exclusion criteria adopted in the review are provided in Table 1.

Table 1.
The inclusion/exclusion criteria applied in the literature review

Inclusion criteria	Exclusion criteria
IC1: Full papers published from 2013 onwards.	EC1: Papers published before 2013 or meeting abstracts, editorials, notes, letters or conference reviews.
IC2: Written in the English language.	EC2: Written in a language other than English.
IC3: Related to nudging of employees.	EC3: No nudging or nudging is not targeted at employees, but has general application.
IC4: Nudging technique is designed and implemented at an organisational level.	EC4: Nudging technique is used to meet public policy goals and an organisation only plays a role of an intermediary.
IC5: Reporting empirical research.	EC5: Purely theoretical or conceptual papers.

Source: Own elaboration based on the literature review.

The review process based on the PRISMA diagram is presented in Figure 1.

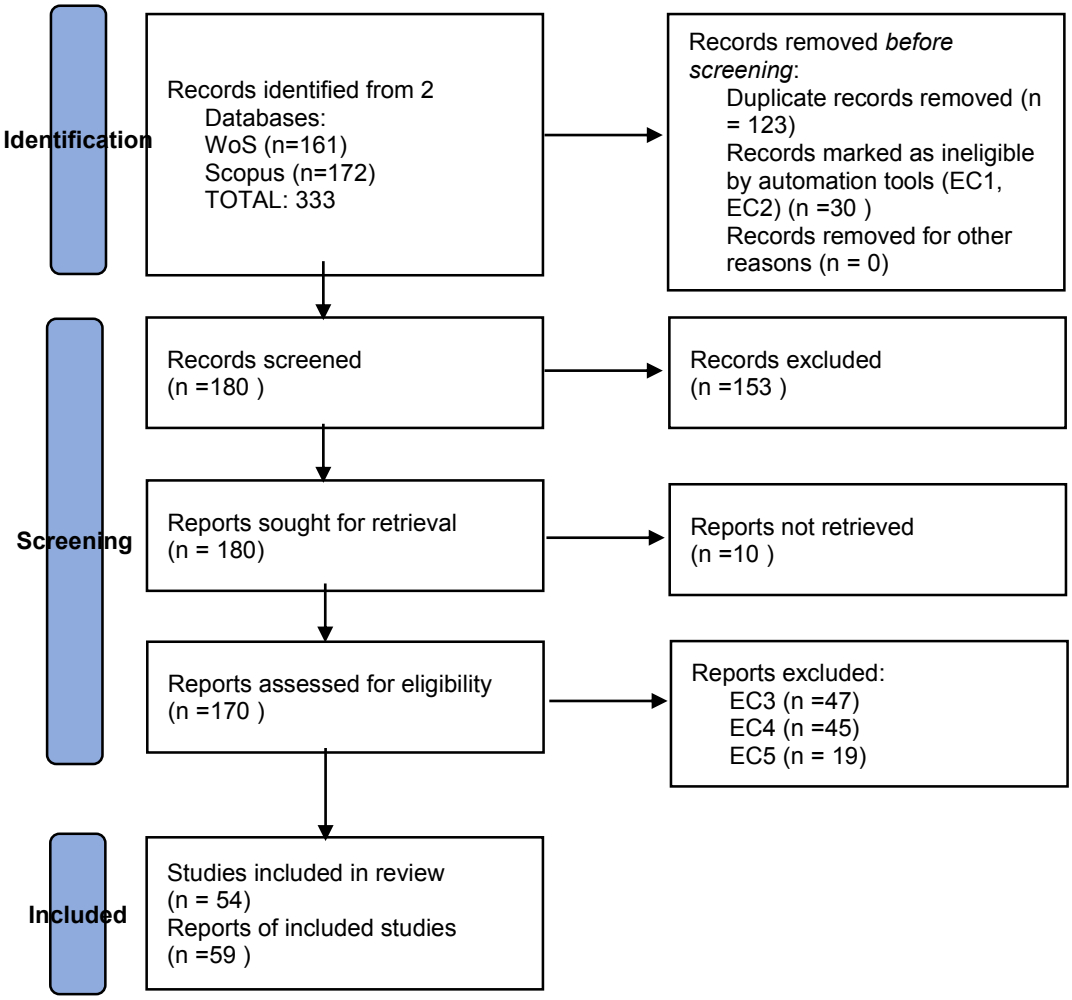

Figure 1. The review process based on the PRISMA diagram.

Source: Own elaboration using the PRISMA template.

4. The results of the review

4.1. Targeted work behaviour and nudging techniques used

Work-based nudge interventions under review were targeted at various work behaviours which can be grouped into the following main categories: (1) improving employees' health and wellbeing, (4) improving employees' communication and performance, (2) ensuring safety culture at work, (3) promoting pro-environmental behaviours. They are presented in Table 2.

Table 2.
Behaviours at work at which nudges are targeted at

Work behaviour	Literature
Improving employees' health and wellbeing 1. healthier food options (16 studies)	Meeusen et al. (2023); Gavrieli et al. (2022); Rosi et al. (2022); Rantala et al. (2022); Rantala et al. (2021); Jia et. al. (2022); Immink et al. (2021); Montagni et al. (2020); Walker, Flannery (2020); Vasiljevic et al. (2019); McCurley et al. (2019); Velema et al. (2017); Hollands et al. (2018); Allan et al. (2017) - systematic review on nudging targeted at eating behaviour in the workplace; Baskin et al. (2016); Wilson et al. (2015)
2. more psychical activity, reducing sedentary work (8 studies)	Barbar et al. (2023); Cooley et al. (2022); Mamede et al. (2021); Forberger et. al. (2022) – literature review; Haile et al. (2020); Van der Meiden et al. (2019); Venema et al. (2018); Avitsland et al. (2017)
3. others (3 studies)	Colenberg, Jylhä (2022) – literature review on workplace design features that have positively influenced workers' well-being; Sinha, Jain, (2022) – increasing vaccination rates at the workplace; Takebayashi et al. (2022) - reducing obesity by promoting workers' regular self-weighting
improving employees' communication and performance (13 studies)	Stieler, Henike (2022); Belle, Cantarelli (2021); Van Toorn et al. (2022); Lomborg (2022); Bulte et al. (2021); Pfeiffer et al. (2020); Sharevski (2020); Kosmyna, Maes (2019); Dianoux et al. (2019); Kretzer, Maedche (2018); Bashirieh et al. (2017); Martin (2017); Meleyal (2017)
Safety-related behaviours and reducing littering at work (6 studies)	Zetterholm et al. (2022); Dewies et al. (2021); Wu, Paluck (2021); Sterk, Heinemann (2021); Carmichael et al. (2018); Lindhout, Reniers (2017) –literature review
promoting pro-environmental behaviours at work (4 studies)	Charlier et al. (2021); De Figueiredo et al. (2020); Chakravarty, Mishra (2019) ; Michaels, Powell (2017)
Others (4 studies)	Geng et al. (2022) - encouraging employees to choose delayed but larger wage payment using colour cues; Venema, Van Gestel (2021) –nudging in the workplace in general; Atal et al. (2019) – influencing gender diversity; Kissmer et al. (2018) – susceptibility to digital nudging

Source: Own elaboration based on the literature review.

The biggest group of studies (27 studies) dealing with nudging in the workplace was targeted at improving employees' health and wellbeing, mainly by increasing employees' healthy food choices in workplace canteens as well as by promoting physical activity and reducing sedentary behaviour in the workplace. The nudging techniques applied in the former case took the form of increasing prominence of healthy options by: food labelling (Meeusen et al., 2023; Rosi et al., 2022; Jia et. al., 2022; Montagni et al., 2020; Montagi et al., 2020; Vasiljevic et al., 2019; McCurley et al., 2019) making up appealing dish names and descriptors emphasizing tasty and enjoyable attributes to boost interest in plant-rich, lower calories dishes (Gavrieli et al ., 2022), priming posters and improved product placement, (Meeusen et al., 2023; Rantala et al., 2022; Immink et al., 2021; Baskin et al., 2017), or altering portion size (Hollands et al., 2018). In the latter case, in order to promote physical activity and reduce sedentary work, in particular among office workers, stair usage and more walking are frequently targeted behaviours of nudge interventions. For that purpose, prompts and signs are located at the "point of choice" between escalators and stairs, footsteps are placed on the floor leading to the staircase, stair-riser banners are added containing a positive feedback message, placed at every top stair riser before reaching the next floor, etc. (Van der Meiden et al., 2019; Avitsland et al., 2017). In the study of Venema et al. (2019) in order to reduce sedentary behaviour at work over time – the default setting of sit-stand desk (SSDs) was changed from sitting to standing height. The placement of such desks was found as an attractive one-off investment for companies, because it allows employees to reduce their sitting time without having to leave their desks. Reminders such as chair sensors, software packages, office clock with reminder function etc., are also frequently used to reduce prolonged sedentary behaviour in offices (Cooley et al., 2022). Interestingly, physical nudges are increasingly more supplemented or substituted by digital nudges. In the research of Mamede et al. (2021) gamification and psychical nudges (such as motivational and point-of-choice prompts) was combined in an App (MoveMore) to promote walking breaks and reduce sedentary behaviour of office workers. In the study of Haile et al. (2020), a nudge-based digital intervention – Welbot was used. This personalised digital intervention sent, at regular intervals, notifications with pictures and motivational messages, encouraging users to engage in a simple 1-3 min activity based on previously set and personalised goals.

The second biggest group of studies dealing with nudging in the workplace (13 studies) contains studies where nudging was used to improve employees communication and performance, in particular knowledge sharing in an organisation. Belle and Cantarelli (2021) tested the effect of descriptive social norms on help-seeking behaviours of public employees in healthcare organisations. Informing what the majority of peers do triggered the conformity and increased the probability of making help requests on the job. Using the same type of cognitive bias, Kretzer and Maedche (2018) demonstrated how enterprise recommendation agents and social nudges can be used to increase information retrieval in an organisation, and more specifically – reuse of existing reports, and thereby prevent redundant reports, data

inconsistencies and, as a consequence – poor-decision making. Enterprise recommendation agents, as an extension of enterprise information system, facilitates users' information searches. However, simply identifying and recommending reports is not sufficient to influence an employee's decision to actually reuse a certain report. Therefore, social influence phenomenon was used to achieve that. Building on three common forms of social influence in organisations: social cohesion (proximity), institutional isomorphism (similarity of positions in terms of business function and location), and hierarchical power, the authors designed four social nudges to steer an employee toward choosing a certain report recommendation from a set of multiple recommendations. The nudges took the form of messages displayed on screens, in which each report recommendation provided additional information about a previous user – their business function, the location and position, as well as whether the recommended report's user is directly connected to the current user or not. In a similar vein, Van Toorn et al. (2022) analysed the applicability of gamification with social notification badges for improving knowledge share and reuse. Query-Driven Knowledge Sharing Systems partially automates knowledge sharing by building the context into data. However, its potential can be limited by analysts' attitudes and behaviours. To overcome these barriers a gamified variant of the platform was designed, which in comparison to the standard platform to create query, content and search previous queries, included two additional design elements (nudges): a search bar with pop-up nudge encouraging users to search for past queries to reuse, and slide-in social notification nudge communicating about other employees who had reused the query. Also Pfeiffer et al., (2022) demonstrate how transfer of know-how between generations in a company can be enhanced through gamification and nudging and how block-chain technologies can play a role in knowledge management. Stieler and Henike (2022) and Dianoux et al. (2019), in turn, consider nudging as a vital tool for fostering organisational innovation. Steiler and Henke (2022) show, on the example of the leading German manufacturing company, how nudging can create innovation engagement of employees in mature companies that struggle with commonly-known innovation management barriers, such as: limited meaning, allowance and capability. The key point made by the authors is that as "the best thinking can come from anywhere" (p. 44), nudging approach can better unlock the prescribed, but often untapped potential in an organisation and digitalisation of the existing processes in a company opens up new avenues for nudges application in corporate context. (For an inventory of nudges used in the workplace – see: Table 3.) Dianoux et al. (2019), on the other hand, point at the potential of nudges to contribute to the agility of an organization, its capacity to remain "continuously in motion", due to the fact that nudging can be based on experimental and iterative processes, are easy and not expensive to put in place. The studies of Martin (2017) and Butle et al. (2021) examined the application of framing nudge to increase organisational performance. Martin (2017) explored different ways in which choice was presented, to overcome status quo bias to commute to the traditional workplace and thereby enhance adoption of telework among employees. Due to limited information people subconsciously evaluate each option within

a specific frame of reference and perceive loss much more than potential gains from the alternative. His findings suggest that a bias for an implicitly perceived status quo can be overruled through an explicitly stated reference point and that embedding the right reference point within communications can frame a decision choice more favourably. Bulte et al. (2021), in turn, explored incentive spillovers, and more specifically – the effect of loss-framed versus gain-framed incentives on the incented task as well as non-incented tasks performed at the same time and subsequently. Consonant with the previous research their field experiments provide evidence that loss aversion incentive induces greater effort on the incented task and they report no harmful spillover effects to subsequent tasks. It has also been found that the growing body of literature is related to the technologies which are currently more common in the work environment, i.e. self-tracking applications that rely on analytics enhanced by machine learning to inform, target and optimise employees' work habits, e. g. Microsoft MyAnalytics (Lomborg, 2022), or AttentivU (Kosmyna, Maes, 2019).

Table 3.
Nudge types used in the workplace

Work behaviour	Nudge types
Healthier food options	increasing prominence of healthy options by making up appealing dish names and descriptors emphasizing tasty and enjoyable attributes, traffic light labelling system (red-unhealthy, green – healthy), priming posters and improved product placement, altering portion size; increasing the prominence of calorie labelling, motivational statements
More psychical activity, reducing sedentary work	signs located at the "point of choice" between escalators and stairs, footsteps placed on the floor leading to the staircase, stair-riser banners, promotion of walking by self-monitoring (e.g. step counts), goal-setting; reducing sedentary behaviour with help of the default setting of sit-stand desk (SSDs), chair sensors, software packages, office clock with reminder function, welbot - personalised digital intervention sending notifications encouraging a user to engage simple physical activities; combining web-based gamification and physical nudges with an app (MoveMore) to promote walking breaks and reduce sedentary behaviour of office workers; work office design to increase comfort, restoration and social cohesion; social support (nonverbal cues such as kudos or likes) and motivational messaging to increase participation in the corporate wellness programme, etc.
Improving employees' communication and performance	social norms informing what majority of peers do and building on common forms of social influence in organisations: social cohesion (proximity), institutional isomorphism (similarity of positions in terms of business function and location), and hierarchical power; gamified social badges; digital workflow tool, collective foresight radar, topic campaigns and curation utilising a set of nudges such as: simplification, defaults, salience, commitments, etc.; framing - embedding the right reference point within communications; motivational posters and stickers to encourage alertness to good practice, requirements to confirm the commitment to the professional code of practice when logging-in and wanting to use the data base; self-tracking applications that rely on analytics enhanced by machine learning to inform, target and optimise employees' work habits
Safety-related behaviours and reducing littering at work	point-of-decision prompts to counteract forgetting, social norms, a wearable proximity-detection technology; priming nudge in the form of decals depicting golden coins placed on the production floors to encourage workers to throw waste in trash bins rather than on the floor

Cont. table 3.

Promoting pro-environmental behaviours	"moral appeal" nudges, i.e. messages stressing the responsible use of energy, the "social comparison" nudges which informs employees on the energy consumption of other peer firms, visual prompts in the form of stickers and posters that provide information on everyday actions that might reduce the individual and overall energy consumption of the company; default setting - programming devices to automatically switch off after a period of non-activity, changing the default printer settings to double-sided printing

Source: Own elaboration based on the literature review.

The third category includes studies of using nudges to promote workplace safety-related behaviours. Frequently they are designed to support users' situational awareness and have a form of just-in-time prompts, i.e. notifications that are timed to be pushed or displayed based on certain activity or inactivity, because peoples' attention is limited and easily distracted. Dewies et al. (2021) tested two nudge techniques to increase compliance of employees of a Dutch local government department with a policy to wear an identifying lanyard with their employee badge for a security reasons. The first nudge was a point-of-decision prompt that served to counteract forgetting to wear the lanyard. It had a form of stickers with an image of a person wearing the lanyard and text saying "You're holding it already, now just wear it". The stickers were placed at all printers and access points to the department's office space as in this places employees needed to scan their badges. The second nudge was meant to raise awareness of security norms. For this purpose, mirrors with a life-size print of the lanyard on it were placed at the department's office space. Observing oneself in a mirror is a typical manipulation to increase awareness of oneself. The study of Zetterholm et al. (2022), in turn, is a good example how technology and digital nudges can counteract human attentional deficits. They tested a wearable proximity-detection technology to nudge employees to maintain physical distance from others during the COVID-19 Pandemic. A dual nudge was used that involves vibration followed by sound to encourage immediate action when the distance to others is not maintained. However, proximity-based warning systems can be used in the workplace for other purposes as well, in particular, in dangerous working environments such as construction sites, or manufacturing plants. On the different note, Wu and Paluck (2021) conducted a field experiment in a Chinese workplace to test the effectiveness of the priming nudge in the form of decals depicting golden coins placed on the production floors to encourage workers to throw waste in trash bins rather than on the floor.

Finally, nudges in the workplace are used to promote pro-environmental behaviour, in particular to promote employees' energy conservation and reduction of paper waste. Charlier et al. (2021) tested three types of nudges to lower energy consumption: the "moral appeal" nudge – e-mail messages stressing the responsible use of energy, the "social comparison" nudge which informs employees on the energy consumption of other peer firms, and visual prompts in the form of stickers that, in a funny way, provided information on several everyday actions that might reduce the individual and overall energy consumption of the company. Their research provides insights into complementarity of different nudges applied to lower energy use in the

workplace. When nudges were implemented alone, there was no significant effect on employees' behaviour. However, when the moral appeal and social comparison nudges were combined with visual prompts, they became effective. The reason for it lies presumable in it that the first two nudges rise employee's awareness, while the third one – provides information necessary to act and plays a role of a reminder to improve energy conservation. There is also evidence to attest the fact that default settings and relying on peoples' inertia are effective strategies in environmental conservation programmes. Programming devices to automatically switch off after a period of non-activity can lead to significant energy reduction (Staddon et al., 2016, as cited in Venema, Van Gestel, 2021). Reducing paper waste – is another pro-environmental behaviour targeted in the workplace. Egebark and Ekström, (2016, as cited in Venema, Van Gestel, 2021), compared the effects of two nudges to influence paper use among university employees. Contrary to initial expectations moral appeal nudge - a message asking university employees to cut back on printing and to use double-sided printing whenever possible had no effect while reduction in paper waste has been achieved thanks to changing the default printer settings to double-sided printing. Comparing the two conservation programmes, the injunctive social norm and default – they pointed at the latter alternative as the most promising in resource conservation initiatives. However, Chakravarty and Mishra (2019) examined effects of injunctive social norms on paper use in two information technology firms in India. In this field experiment posters asking individuals to use less paper were placed on printers and in office cubicles. They found out that during the intervention, employees spent a significantly lower number of sheets per day as compared to the pre-intervention period, measured both in terms of paper used and paper wasted. Moreover, the positive effect lasted over several weeks after the nudge had been removed. De Figueiredo et al. (2021, p. 206) take a somewhat broader perspective on sustainable consumption in the workplace, where individual behaviour is a result of a situated learning – human interactions and intentional material arrangements introduced in the work environment that nudge sustainable energy consumption. As they report: 'the material elements' content became part of the employees' routine over time, changing from simple reminders to become incorporated into practices".

4.2. Factors influencing the effectiveness of nudging in the workplace

In most of the studies under review positive effects of nudging in the workplace are reported, although their effectiveness varies. There were also instances of null effects and even backfiring, i.e. where nudges generated behavioural changes in the opposite direction of what was intended (e.g. Dewies 2021; Avitsland et al., 2017; Willson et al., 2015). This begs the question on factors that influence the effectiveness of nudging. Based on the conducted literature review three main factors influencing effectiveness of nudging in the workplace can be identified: (1) starting dispositions of individuals whose behaviour is aimed to be changed, (their attitudes, habits and intentions) (2) situational factors which may interact with the selected nudges, and (3) cultural differences.

Few empirical studies found that individual factors such as strong attitudes, habits and intentions affect the effectiveness of nudging interventions. There is evidence that unsupportive attitudes towards a given policy can cause nudges to be ineffective when applied alone. Nudging strategy used to increase compliance with a security policy requiring employees to wear a lanyard with their employee badge attached to it turned out to be ineffective because of the negative attitude of Dutch local government employees towards nudges which were considered as unnecessary and paternalistic. A substantial group of employees believed that wearing an identifying lanyard separated them from peers working for other departments who did not need to wear it and that this security measure was unnecessary. First, because they can recognize all employees even without the lanyard and secondly, the requirement to scan one's badge to get access to the department's office area was deemed as sufficient protection. Adding to it a lack of personal consequences (sanctions) for not complying the lanyard policy led to the nudging strategy failure (Dewies et al, 2021). It is argued that nudges are particularly effective when there are no clear preferences for a particular choice option or there are conflicting preferences. Then environmental cues can tip the scale in favour of one of the options and thereby reduce the conflict (Venema, Van Gestel, 2021; Venema et al., 2020). Intervention promoting workplace stair-climbing with stair leading footprints and stair-riser banners in the study of Avitsland et al (2017) resulted in significant decreases in stair climbing. It is assumed that the intervention failure was due to a pre-existing high amount of stair climbing and irritation among some employees. The authors point out: "In this case, the influence was telling people to do something they were already doing, which seems to have been interpreted as nagging, and resulted in spiteful behaviour" (p. 8). Kissmer et al. (2018) proposed a model to analyse digital nudging acceptance by employees. Next to intervention factors, such as the perceived nudge intensity and tailoring (personalisation), they incorporated into the model the following individual factors that influence the success or failure of digital nudges: consensus (how far an individual does as other people do), authority (how far an individual value the opinion of experts, superiors), autonomy (the degree of self-congruence, interest-taking and susceptibility of control) and technological commitment (how an individual experiences and is confident with technology).

Secondly, it is claimed in the literature (Belimi, Schroeder, 2021; Wilson et al., 2011), that people might behave differently in the workplace than in their domestic environment. Hence, the effectiveness of the nudges that are targeted at individual decision-making can be affected by situational factors. In the corporate context we tackle the problem of identity and diffused responsibility. For example, while at work employees may not translate their pro-environmental behaviours, in terms of energy use, recycling practices etc. at home to the office. McDonalds (2011, cited in Michaels, Powell, 2017) while comparing the recycling rates at home and in the workplace found out that people tend to recycle more at home than at work because they do not feel to blame for not recycling and shift the responsibility for recycling to the employer. They are also not the ones that pay energy bills and typically are not directly

responsible for the company's environmental impact. Being only a part of a bigger whole employees do not see the consequences of their own actions. Moreover, there are situational moderating variables that may interact with the selected nudges. For example in the study of Cooley et al. (2022, pp. 574-575) office-based workers were interviewed to gain an understanding of their experiences of being exposed to nudges suggesting alternative behaviours of prolong sitting and taking movements breaks during work periods. The participants felt uneasy because their increased self- and others- monitoring of their alternative behaviour and cited many "maladaptive feelings because of a perception of incongruency with the established work normative behaviour". Social nature of offices and many workplaces requires an approach at the level of social practices and organisational routines, that take into account social influence and interdependency of actions carried out by multiple actors. For example, the study of de Figueiredo et al. (2020) focuses on the workplace as a rich environment where social learning is not limited to individuals but is also rooted in the community of practitioners at an organizational level. On a related note, Walker and Flanney (2019) and Baskin et al. (2016) addressed in their study the so-called office cake culture and providing by employers free snacks at the office to bolster employee satisfaction. As it undeniable can negatively affect employees health and contribute to weight gain, it plays also a positive role in the workplace by bringing people together, integrating teams and is generally considered to have morale-boosting characteristics. Their findings suggest that nudge-based initiatives such as reducing salience of snacks and creating new social norm to gain acceptance that the snacks' access will be restricted to limited occasions to which employees can look forward (Walker, Flanney, 2019), or simply increasing the relative distance between snacks and beverages (Baskin et al., 2016) can help employees make healthier food choices while retaining social benefits and employees' satisfaction.

Finally, these are cultural differences that influence effectiveness of nudges when implemented in a particular setting. In China, for example, far greater importance is attached to items that evoke a sense of honour and prestige. While implementing nudge interventions this cultural trait should be taking into account, for instance in food labelling to increase salience of healthy food options (Gavrieli et al., 2022). In the study of Wu and Paluck (2021) Chinese belief in golden coins as protecting fortune and luck was used to design nudge intervention in the form of decals depicting golden coins which were placed on the production floor to encourage Chinese workers to throw waste in trash bins rather than on the floor. Given the existing cultural differences the nudge presumably would not be that effective in different settings.

5. Conclusions and directions for further research

Conducted literature review confirms the fact that nudging inside companies is still an emerging research topic in business management that deserves further attention. The problems with establishing the state of research on nudging in the workplace arise from differences in how nudges are defined, as well as the lack of established method for systematical validation and evaluation of their effectiveness in the corporate context. In particular, long-term studies that analyse habituation and behavioural changes beyond the intervention period are missing, as well as the potential of digital and mixed approaches is not yet fully exploited.

With regard to the three research questions that guided our literature review, the following conclusions can be drawn. First, when nudges are implemented in the corporate context they are most frequently used to influence the following workplace behaviours: (1) improving employees' health and wellbeing, in particular by increasing employees' healthy food choices in workplace canteens as well as by promoting physical activity and reducing sedentary behaviour in the workplace; (2) improving employees' communication and performance, in particular to promote knowledge sharing in an organisation; (3) ensuring safety culture at work, in particular to support users' situational awareness; as well as (4) promoting pro-environmental behaviours, in particular to encourage employees' energy conservation and reduction of paper waste. Secondly, as for the nudge types used to influence the above mentioned workplace behaviour the following key nudges are worth mentioning as the most promising for managerial applications: descriptive social norms to encourage employees to knowledge sharing and re-use, reminders - to reduce sedentary behaviour in the workplace or ensure safety culture at work, and defaults in corporate conservation programmes. Descriptive social norms encourage desired behaviours by indicating what others (peers) do and capitalising on peoples' desire to fit in with others. Finding the right reference group is crucial for the effectiveness of social norms. In the corporate context – these can be those similar in terms of business function, position, or location (e.g. Kretzer, Maedche, 2018). Reminders are nudges that counteract peoples' attentional limitations and simply cause someone to remember something using different modes of communications, e.g. e-mails, text messages, making sounds. The timing and the message of a reminder are two crucial factors for its effectiveness. Finally, defaults – play on the peoples' tendency to status quo and have many various applications in the workplace. Default options are pre-set courses of action that come into being as long as the decision-maker actively decides otherwise. Defaults are effective in influencing behaviour when there is inertia or uncertainty in decision making. In this latter case, they may be perceived as a recommended course of action. The third question that guided our research pertains the overall factors that affect effectiveness of nudging approach in the workplace. Based on the conducted literature review the following three factors can be identified. First, these are starting dispositions of individuals whose behaviour is aimed to be changed,

i.e. their attitudes, habits and intentions. Preferably, when there are no clear preferences for a particular choice option or there are conflicting preferences. Therefore, researchers and practitioners are advised to survey and reflect on target group's attitudes and preferences before implementing nudge interventions. Secondly, these are situational factors which may interact with the selected nudges. Nudging in the workplace is different than nudging people's domestic and private lives and experiences gained in these settings cannot be simply transposed to workplace setting. This is because of the identity problem and diffused responsibility. As a consequence, employees need to have a sense of ownership of organisational changes. Just providing them information or incentives may not be enough. Moreover, social nature of many workplaces requires an approach at the level of social practices and organisational routines, which take into account social influence and interdependency of actions carried out by multiple actors. Thirdly, these are cultural variances that affect the effectiveness of nudges. It is argued that cognitive biases which are exploited in nudging approach interact with culturally variable features. Cultures may be more or less susceptible to certain biases. Moreover, biases may conflict with one another and how the conflict is resolved may be culturally dependent (Bovens, 2010). For example, people are driven by the desire for conformity as well as to stand out. Some cultures may value the former at the expense of the latter (the so-called collectivist cultures, such as Mexico or Turkey), and vice versa (individualistic cultures, such as the US or the UK). Hence, nudging requires a keen awareness of the culture .

On a final note, technology advancement opens up new avenues for nudging application in the workplace. Extending the concept of nudging to the digital environment and research on the behavioural effects of interface-design decisions on user' behaviour is a very promising agenda for future research. The technology-mediated nudges allow for a more personalised, well-timed approach. It is also worth mentioning that digital nudging is one out of five key trends recognised by the Communications Trend Radar 2021 - the study which every year identifies key trends in the areas of management, technology and society, i.e. trends that will change corporate communications. Nevertheless, these developments are not free from legal and ethical concerns that should be addressed in the context of self-tracking applications, automated decision-support systems and economy increasingly dominated by artificial intelligence. Nudges that are transparent and promoting reflective (versus automatic) thinking are considered to be the least objectionable.

References

1. Allan, J., Querstret, D., Banas, K., de Bruin, M. (2017). Environmental interventions for altering eating behaviours of employees in the workplace: a systematic review. *Obesity reviews, Vol. 18, Iss. 2,* pp.214-226.
2. Atal, N., Berenguer, G., Borwankar, S. (2019). Gender diversity issues in the IT industry: How can your sourcing group help? *Business Horizons*, *Vol. 62, Iss. 5,* pp. 595-602.
3. Åvitsland, A., Solbraa, A., Riiser, A. (2017). Promoting workplace stair climbing: sometimes, not interfering is the best. *Archives of Public Health, 75, Article No. 2*.
4. Babar, Y., Curley, S., Zhihong, K., Liu, D., Sheffler, Z. (2023). The Effects of Digitally Delivered Nudges in a Corporate Wellness Program. *Journal of the Association for Information Systems*, *Vol. 24, Iss. 1,* pp.136-160.
5. Bashirieh, S., Mesbah, S., Redi, J., Bozzon, A., Szlávik, Z., Sips, R. (2017). *Nudge your Workforce: A Study on the Effectiveness of Task Notification Strategies in Enterprise Mobile Crowdsourcing.* UMAP '17: Proceedings of the 25th Conference on User Modeling, Adaptation and Personalization, pp. 4-12.
6. Baskin, E., Gorlin, M., Chance, Z., Novemsky, N., Dhar, R., Huskey, K., Hatzis, M. (2016). Proximity of snacks to beverages increases food consumption in the workplace: A field study. *Appetite*, *Vol. 103,* pp. 244-248.
7. Belle, N., Cantarelli, P. (2021). Nudging Public Employees Through Descriptive Social Norms in Healthcare Organizations. *Public Administration Review*, *Vol. 81, Iss. 4,* pp. 589-598.
8. Belmi, P., Schroeder, J. (2021). Human "resources"? Objectification at work. *Journal of personality and social psychology*, *120(2),* pp. 384-417.
9. Beshears, J., Kosowsky, H. (2020). Nudging: Progress to date and future directions. *Organizational Behavior and Human Decision Processes, Vol. 161, Supplement*, pp. 3-19.
10. Bovens, L. (2020). Nudges and Cultural Variance: a Note on Selinger and Whyte. *Knowledge, Technology & Policy, 23*, pp. 483-486.
11. Bulte, E., List, J., van Soest, D. (2021). Incentive spillovers in the workplace: Evidence from two field experiments. *Journal of Economic Behavior & Organization, Vol. 184,* pp. 137-149.
12. Caldwell, L. (2018). Public and private sector nudgers can learn from each other. *Behavioural Public Policy*, *Vol. 2, Iss. 2,* pp. 235-245.
13. Carmichael, P., Morisset, C., Groß, T. (2018). SHRUBS: simulating influencing human behaviour in security. STAST '18: Proceedings of the 8th Workshop on Socio-Technical Aspects in Security and Trust, Article, No. 6, pp. 1-11.

14. Chakravarty, S., Mishra, R. (2019). Using social norms to reduce paper waste: Results from a field experiment in the Indian Information Technology sector. *Ecological Economics*, *Vol. 164,* 106356.
15. Charlier, C., Guerassimoff, G., Kirakozian, A., Selosse, S. (2021).Under Pressure! Nudging Electricity Consumption within Firms. Feedback from a Field Experiment. *The Energy Journal*, *Vol. 42, No. 1,* pp. 129-154.
16. Colenberg, S., Jylhä, T. (2022). Identifying interior design strategies for healthy workplaces – a literature review. *Journal of Corporate Real Estate*, *Vol. 24, Iss. 3,* pp.173-189.
17. Combining Web-Based Gamification and Physical Nudges With an App (MoveMore) to Promote Walking Breaks and Reduce Sedentary Behavior of Office Workers: Field Study. *Journal of Medical Internet Research, Vol. 23, No. 4,* e19875.
18. Cooley, D., Mainsbridge, C., Cruickshank, V., Guan, H., Ye, A., Pedersen, S. (2022). Peer champions responses to nudge-based strategies designed to reduce prolonged sitting behaviour: Lessons learnt and implications from lived experiences of non-compliant participants. *AIMS Public Health*, *Vol. 9, Iss. 3,* pp. 574-588.
19. De Figueiredo, M., de Castro, N., Silva, M. (2021). A practice-based learning approach toward sustainable consumption in the workplace. *Journal of Workplace Learning*, *Vol. 33, No. 3,* pp. 197-211.
20. Dewies, M., Schop-Etman, A., Rohde, K., Denktaş, S. (2021) Nudging is Ineffective When Attitudes Are Unsupportive: An Example from a Natural Field Experiment. *Basic and Applied Social Psychology*, *Vol. 43, Iss. 4,* pp. 213-225.
21. Dianoux, C., Heitz-Spahn, S., Siadou-Martin, B., Thevenot, G., Yildiz, H. (2019). Nudge: A relevant communication tool adapted for agile innovation. *Journal of Innovation Economics & Management*, *Vol. 28,* pp. 7-27.
22. Egebark, J., Ekström, M. (2016). Can indifference make the world greener? *Journal of Environmental Economics and Management, Vol. 76,* pp. 1-13.
23. Forberger, S., Wichmann, F., Comito, C. (2022). Nudges used to promote physical activity and to reduce sedentary behaviour in the workplace: Results of a scoping review. *Preventive medicine*, *155*, *106922*.
24. Gavrieli, A., Attwood, S., Wise, J. et al. (2022). Appealing dish names to nudge diners to more sustainable food choices: a quasi-experimental study. *BMC Public Health, 22*, 2229.
25. Geng, X., Zhang, K., Ma, J., Yang, H., Chen, Z., Li, S. (2022). Blue, Rather Than Red Light Can Nudge Employees to Choose Delayed But Larger Wage Payment. *Environment and Behavior*, *Vol. 54, Iss. 9-10,* pp. 1227-1250.
26. Haile, C., Kirk, A., Cogan, N., Janssen, X., Gibson, A.-M., MacDonald, B. (2020). Pilot Testing of a Nudge-Based Digital Intervention (Welbot) to Improve Sedentary Behaviour and Wellbeing in the Workplace. *International Journal of Environmental Research and Public Health*, *17(16),* 5763.

27. Hollands, G.J., Cartwright, E., Pilling, M., Pechey, R., Vasiljevic, M., Jebb, S., Marteau, T. (2018). Impact of reducing portion sizes in worksite cafeterias: a stepped wedge randomised controlled pilot trial. *International Journal of Behavioral Nutrition and Physical Activity*, *Vol. 15, Article No. 78*.
28. Immink, V., Kornelis, M., Van Kleef, E. (2021). Vegetable interventions at unconventional occasions: the effect of freely available snack vegetables at workplace meetings on consumption. *International Journal of Workplace Health Management*, *Vol. 14, No. 4,* pp. 426-439.
29. Jia, J., Levy, D., McCurtley, J., Anderson,E., Gelsomin, E., Porneala, B., Thorndike, A. (2022). Health Literacy, Numeracy, and Health Promotion: A Secondary Analysis of the Choosewell 365 Workplace Trial. *American Journal of Preventive Medicine, 63(1),* pp. 93-101.
30. Kahneman, D. (2011). *Thinking, Fast and Slow*. Macmillan.
31. Kahneman, D., Tversy, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, *Vol. 47, No. 2,* pp. 263-291.
32. Kissmer, T., Potthoff, T., Stieglitz, S. (2018). *Enterprise Digital Nudging: Between Adoption Gain and Unintended Rejection Emergent Research Forum (ERF).* 24th Americas Conference on Information Systems (AMCIS) - Digital Disruption.
33. Kosmyna, N., Maes, P. (2019). *AttentivU: a Biofeedback Device to Monitor and Improve Engagement in the Workplace*. 41st Annual International Conference Of The IEEE Engineering In Medicine And Biology Society (EMBC) , pp. 1702-1708.
34. Kretzer, M., Maedche, A. (2018). Designing Social Nudges for Enterprise Recommendation Agents: An Investigation in the Business Intelligence Systems Context. *Journal of the Association for Information Systems, Vol. 19, Iss. 12,* pp. 1145-1186.
35. Ledderer, L., Kjær, M., Madsen E, Busch, J., Fage-Butler, A. (2020). Nudging in Public Health Lifestyle Interventions: A Systematic Literature Review and Metasynthesis. *Health Education & Behavior*, *Vol. 47, Iss. 5,* pp. 749-764.
36. Lindhout, P., Reniers, G. (2017). What about nudges in the process industry? Exploring a new safety management tool. *Journal of Loss Prevention in the Process Industries, Vol. 50,* pp. 243-256.
37. Lomborg, S. (2022). Everyday AI at work: Self-tracking and automated communication for smart work. In: S. Lomborg (Ed.). *Everyday Automation: Experiencing and Anticipating Emerging Technologies* (pp. 126-139). Routledge.
38. Mamede A., Noordzij, G., Jongerling, J., Snijders, M., Schop-Etman, A., Denktas, S. (2021). Combining Web-Based Gamification and Physical Nudges With an App (MoveMore) to Promote Walking Breaks and Reduce Sedentary Behavior of Office Workers: Field Study. *Journal of Medical Internet Research*, *Vol. 23, No. 4,* e19875.

39. Martin, B. (2017). Unsticking the status quo: Strategic framing effects on managerial mindset, status quo bias and systematic resistance to change. *Management Research Review*, *Vol. 40, No. 2,* pp. 122-141.
40. McCurley, J., Levy, D., Rimm, E., Gelsomin, E., Anderson, E., Sanford, J., Thorndike, A. (2019). Association of Worksite Food Purchases and Employees' Overall Dietary Quality and Health. *American Journal of Preventive Medicine, 57(1),* pp. 87-94.
41. McDonald, S. (2011). Green behaviour: Differences in recycling behaviour between the home and the workplace. In: D. Bartlett (Ed.), *Going green: The psychology of sustainability in the workplace*. Leicester: The British Psychological Society.
42. Meeusen, R., van der Voorn, B., Berk, K. (2023). Nudging strategies to improve food choices of healthcare workers in the workplace cafeteria: A pragmatic field study. *Clinical Nutrition ESPEN*, *Vol. 53,* pp. 126-133.
43. Meleyal, M. (2017). Nudging social workers towards interpretive vigilance: approaches supporting management of conduct in the workplace. *European Journal of Social Work*, *Vol. 20, Iss. 6,* pp. 935-946.
44. Michaels, E., Powell, M. (2017). Behavioural Economics: Using 'Nudges' for Promoting Pro-environmental Behaviours in the Workplace. In: P. Baranova, E. Conway, N. Lynch, F. Paterson (Eds.), *The Low Carbon Economy* (pp. 59-85). Cham: Palgrave Macmillan.
45. Montagni, I., Prevot, F., Castro, Z., Goubel, B., Perrin, L., Oppert, J.M., Fontvieille, A.M. (2020). Using Positive Nudge to Promote Healthy Eating at Worksite: A Food Labeling Intervention. *Journal of Occupational and Environmental Medicine, 62(6),* pp. e260-e266.
46. Olejniczak, K., Śliwowski, P. (2014) Nadchodzi rewolucja? Analizy behawioralne w interwencjach publicznych. In: A. Haber, K. Olejniczak (Eds.), *(R)ewaluacja 2. Wiedza w działaniu* (pp. 13-45).Warszawa: Polska Agencja Rozwoju Przedsiębiorczości.
47. Page, M., McKenzie, J., Bossuyt, P., Boutron, I., Hoffmann, T., Mulrow, C. et al. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ, 372, No. 71.*
48. Pfeiffer, A., Bezzina, S., Wernbacher, T., Vella, V., Dingli, A., Serada, A. (2020). *The use of Blockchain-supported Reward Systems for Knowledge Transfer between Generations*. Proceedings of the 21st European Conference on Knowledge Management (ECKM 2020), pp. 620-629.
49. Rantala, E., Järvelä-Reijonen, E., Pettersson, K., Laine, J., Vartiainen, P., Närväinen, J., Pihlajamäki, J. et al. (2022). Sensory Appeal and Routines Beat Health Messages and Visibility Enhancements: Mixed-Methods Analysis of a Choice-Architecture Intervention in a Workplace Cafeteria. *Nutrients, 14(18),* 3731.
50. Rantala, E., Vanhatalo, S., Tilles-Tirkkonen, T., Kanerva, M., Hansen, P.G., Kolehmainen, M., Männikkö, R. et al. (2021). Choice Architecture Cueing to Healthier Dietary Choices and Physical Activity at the Workplace: Implementation and Feasibility Evaluation. *Nutrients, 13(10),* 3592.

51. Rauscher, S., Zielke, A. (2019). *Nudging in management accounting: Assessment of the relevance of nudging in the corporate context*. Springer Gable.
52. Rosi, A., Biasini, B., Monica, E., Rapetti, V., Deon, V., Scazzina, F. (2022). Nutritional Composition and Environmental Impact of Meals Selected in Workplace Canteens before and after an Intervention Promoting the Adherence to the Mediterranean Diet. *Nutrients, 14(21),* 4456.
53. Ruehle, R. (2019). Influencing Employees for a "Good Cause": Mapping the Field of Nudging in Business Ethics. *Academy of Management Annual Meeting Proceedings*, *No. 1,* 19511.
54. Sánchez-Camacho, C., Carranza, R., Martín-Consuegra, D., Díaz, E. (2022) Evolution, trends and future research lines in corporate social responsibility and tourism: A bibliometric analysis and science mapping. *Sustainable development, Vol. 30, Iss. 3,* pp. 462-476.
55. Schwarz, G., Christensen, T., Zhu, X. (2022). Bounded Rationality, Satisficing, Artificial Intelligence, and Decision-Making in Public Organizations: The Contributions of Herbert Simon. *Public Administration Review, Vol. 82, No. 5,* pp. 902-904.
56. Sharevski, F., Jachim, P., Treebridge, P., Li, A., Babin, A. (2020). *My Boss is Really Cool: Malware-Induced Misperception in Workplace Communication Through Covert Linguistic Manipulation of Emails*. IEEE European Symposium On Security And Privacy Workshops (EUROS&PW, 2020), pp. 463-470.
57. Simon, H. (1955). A behavioral model of rational choice. *The Quarterly Journal of Economics*, *Vol. 69, No. 1,* pp. 99‑118.
58. Simon, H. (1957). *Administrative Behavior: A study of Decision‑making Processes in Administrative Organization.* New York: Macmillan.
59. Sinha, S., Jain, N. (2022). The jury is out – Can the HR managers be the choice architects in a post-pandemic work setting? *Journal of Organizational Change Management*, *Vol. 35, No. 1,* pp. 165-168.
60. Staddon, S., Cycil, C., Goulden, M., Leygue, C., Spence, A. (2016). Intervening to change behaviour and save energy in the workplace: A systematic review of available evidence. *Energy Research & Social Science*, *17*, pp. 30-51.
61. Sterk, A., Heinemann, F. (2021). *It is not as simple as that: Playing out password security trainings in order to nudge password changes*. EICC: European Interdisciplinary Cybersecurity Conference, pp. 20-25.
62. Stieler, M., Henike, T. (2022). Innovation nudging—A novel approach to foster innovation engagement in an incumbent company. *Creativity and Innovation Management*, *Vol. 31, Iss. 1,* pp. 35-48.
63. Takebayashi, M., Yoshiike, N., Koyama, T., Toriyabe, M., Nakamura, H., Takebayashi, K. (2022). Validation of the most cost-effective nudge to promote workers' regular self-weighing: a cluster randomized controlled trial. *Scientific Reports, 12, Article No.15501*.

64. Thaler, R.H., Sunstein, C.R. (2008). *Nudge: Improving decisions about health, wealth, and happiness*. Yale University Press.
65. Tversky, A., Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases. *Science, New Series, Vol. 185, No. 4157,* pp. 1124-1131.
66. Van der Meiden, I., Kok, H., Van der Velde, G. (2019). Nudging physical activity in offices. *Journal of Facilities Management, Vol. 17, No. 4,* pp. 317-330.
67. Van Toorn, C., Kirshner, S., Gabb, J. (2022). Gamification of query-driven knowledge sharing systems. *Behaviour & Information Technology*, *Vol. 41, Iss. 5,* pp. 959-980.
68. Vasiljevic, M., Fuller, G., Pilling, M., Hollands, G., Pechey, R., Jebb, S., Marteau, T. (2019). What is the impact of increasing the prominence of calorie labelling? A stepped wedge randomised controlled pilot trial in worksite cafeterias. *Appetite, 141*, 104304.
69. Velema, E., Vyth, E., Steenhuis, I. (2017). Using nudging and social marketing techniques to create healthy worksite cafeterias in the Netherlands: intervention development and study design. *BMC Public Health, 17, Article No. 63*.
70. Venema, T., Kroese, F., De Ridder, D. (2018). I'm still standing: A longitudinal study on the effect of a default nudge. *Psychology & Health*, *Vol. 33, Iss. 5,* pp. 669-681.
71. Venema, T., van Gestel, L. (2021). Nudging in the workplace: Facilitating desirable behaviour by changing the environment. In: R. Appel-Meulenbroek, V. Danivska (Eds.), *A handbook of theories on designing alignment between people and the office environment* (pp. 222-235). Routledge/Taylor & Francis Group.
72. Walker, L., Flannery, O. (2020). Office cake culture: An exploration of its characteristics, associated behaviours and attitudes among UK office workers; implications for workplace health. *International Journal of Workplace Health Management*, *Vol. 13, No. 1,* pp. 95-115.
73. Wee, S.-C., Choong, W.-W., Low, S.-T. (2021). Can "Nudging" Play a Role to Promote Pro-Environmental Behaviour? *Environmental Challenges, 5*, 1000364.
74. Weijers, R., de Koning, B., Paas, F. (2021). Nudging in education: from theory towards guidelines for successful implementation. *European Journal of Psychology of Education, Vol. 36,* pp. 883-902.
75. Wilson, A., Bogomolova, S., Buckley, D. (2015). Lack of Efficacy of a Salience Nudge for Substituting Selection of Lower-Calorie for Higher-Calorie Milk in the Work Place. *Nutrients*, *7(6),* 4336-4344.
76. Wu, S., Paluck, E. (2021). Designing nudges for the context: Golden coin decals nudge workplace behavior in China. *Organizational Behavior and Human Decision Processes*, *Vol. 163,* pp. 43-50.
77. Zetterholm, M., Nilsson, L., Jokela, P. (2022). Using a Proximity-Detection Technology to Nudge for Physical Distancing in a Swedish Workplace During the COVID-19 Pandemic: Retrospective Case Study. *JMIR Formative Research*, *6(12),* e39570.