University of Groningen

The selection, optimization, and compensation model in the work context

Moghimi, Darya; Zacher, Hannes; Scheibe, Susanne; Van Yperen, Nico W.

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

The selection, optimization, and compensation model in the work context: A systematic review and meta-analysis of two decades of research

DARYA MOGHIMI[1]*, HANNES ZACHER[1,2], SUSANNE SCHEIBE[1]
AND NICO W. VAN YPEREN[1]

[1]*Department of Psychology, University of Groningen, Groningen, The Netherlands*
[2]*School of Management, Queensland University of Technology, Brisbane, QLD, Australia*

Summary   Over the past two decades, the selection, optimization, and compensation (SOC) model has been applied in the work context to investigate antecedents and outcomes of employees' use of action regulation strategies. We systematically review, meta-analyze, and critically discuss the literature on SOC strategy use at work and outline directions for future research and practice. The systematic review illustrates the breadth of constructs that have been studied in relation to SOC strategy use, and that SOC strategy use can mediate and moderate relationships of person and contextual antecedents with work outcomes. Results of the meta-analysis show that SOC strategy use is positively related to age ($r_c = .04$), job autonomy ($r_c = .17$), self-reported job performance ($r_c = .23$), non-self-reported job performance ($r_c = .21$), job satisfaction ($r_c = .25$), and job engagement ($r_c = .38$), whereas SOC strategy use is not significantly related to job tenure, job demands, and job strain. Overall, our findings underline the importance of the SOC model for the work context, and they also suggest that its measurement and reporting standards need to be improved to become a reliable guide for future research and organizational practice. Copyright © 2016 John Wiley & Sons, Ltd.

Keywords: action regulation; meta-analysis; review; selection, optimization, and compensation; SOC

Introduction

Employees often face multiple demands and pursue several goals simultaneously. However, their resources might not always suffice to meet all demands and to achieve all goals, and thus, employees need to adapt their behavior to be successful. The selection, optimization, and compensation (SOC) model proposes that in situations characterized by high demands and limited resources, individuals can make use of a set of four action regulation strategies that help them invest their resources in an optimal way (P. B. Baltes, 1997; P. B. Baltes & Baltes, 1990; Freund & Baltes, 2000). *Selection* involves the prioritization of some goals over others, either to achieve a desired state (*elective selection*) or in response to a loss of resources needed for goal achievement (*loss-based selection*). *Optimization* entails the acquisition, refinement, and use of resources that are needed to achieve the selected goals, and *compensation* involves substituting for the (potential) loss of resources by acquiring and using new or previously unused resources. The conjoint consideration of goals and resources, and the specification of adaptive responses to resource losses, render the SOC model a unique approach to action regulation in the work context (B. B. Baltes, Rudolph, & Bal, 2012; Müller & Weigl, 2015; Zacher & Frese, in press).

Over the past two decades, organizational scholars have repeatedly emphasized the potential importance of the SOC model for the work context (e.g., B. B. Baltes & Dickson, 2001; Truxillo, Cadiz, & Hammer, 2015), and authors frequently use the SOC model as a theoretical framework to develop hypotheses on the role of age in the work context (without operationalizing it; Bal & De Lange, 2015; Hertel et al., 2013; Kooij & Van De Voorde, 2011; Truxillo, Cadiz,

*Correspondence to: Darya Moghimi, Department of Psychology, University of Groningen, Grote Kruisstraat 2/1, 9712 TS, Groningen, The Netherlands. E-mail: d.moghimi@rug.nl

Rineer, Zaniboni, & Fraccaroli, 2012; Tschopp, Grote, & Köppel, 2015; Zaniboni, Truxillo, & Fraccaroli, 2013; Zaniboni, Truxillo, Fraccaroli, McCune, & Bertolino, 2014). Moreover, several empirical studies investigated associations of SOC strategy use with various employee and job characteristics, as well as work outcomes. However, so far, neither a systematic review nor a meta-analysis of the literature on SOC strategy use at work has been conducted. Consequently, research on the SOC model at work remains fragmented and fails to provide a clear agenda for future research and a reliable guide for organizational practice.

In this article, we first describe the theoretical background and operationalization of SOC strategy use. Second, we outline the methods and results of a systematic review and a meta-analysis of the literature on SOC at work. In the systematic review, we examine relationships of SOC strategy use with all antecedents and outcome variables that have been empirically studied to date (Figure 1). The meta-analysis focuses on those antecedents and outcomes that have been empirically investigated in relation to SOC strategy use in at least five independent samples. Finally, we critically discuss limitations of the current literature on SOC strategy use at work and outline recommendations for future research and organizational practice.

Theoretical Background and Operationalization

Development of the SOC model

The SOC model was developed in the lifespan developmental literature (P. B. Baltes & Baltes, 1990). It assumes that the use of SOC strategies is particularly adaptive and results in successful development when demands are high and resources are low. P. B. Baltes and Baltes (1990) originally conceptualized the SOC model as a meta-theory of development that can be applied to different levels of analysis (e.g., individual, group, organization, and society) and specific contexts (e.g., work and family life). At the individual level, the SOC model proposes that people who experience a mismatch between their demands and resources can maintain effective functioning and well-being by using SOC strategies. Freund and Baltes (2000) specified an action-theoretical application of the SOC model by
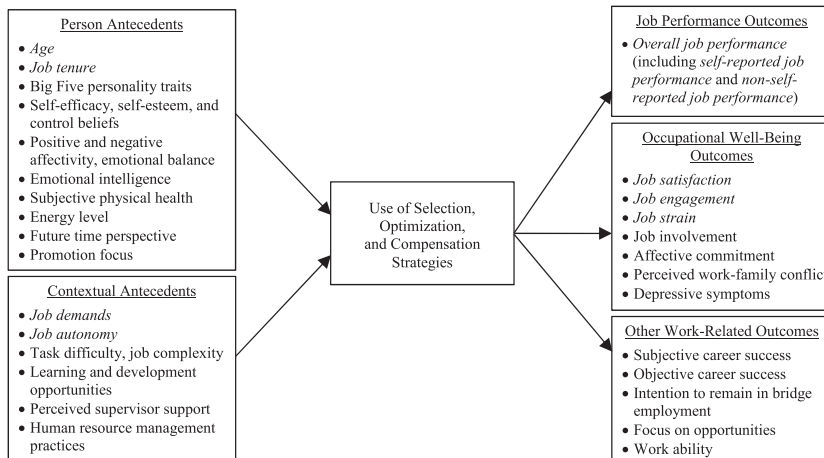

Figure 1. Overview of constructs included in the systematic review and meta-analysis. All antecedent and outcome variables shown were included in the systematic review. Antecedent and outcomes variables that were examined in five or more independent samples were included in the meta-analysis and are italicized

focusing on goal-directed behaviors that people can show in different contexts, including work. This individual-level, action-regulatory perspective has become the dominant focus of empirical research on SOC strategy use in the organizational literature. In a conceptual paper, B. B. Baltes and Dickson (2001) also applied the SOC model to work–family conflict, leadership, and organizational effectiveness. However, so far, empirical research has only addressed employees' experiences of work–family conflict but not leadership and organizational effectiveness using the SOC model as theoretical framework.

Selection, optimization, and compensation components

The SOC model outlines four distinct action regulation strategies that people may use to deal with situations characterized by high demands and limited resources: elective selection, loss-based selection, optimization, and compensation (P. B. Baltes & Baltes, 1990; Freund & Baltes, 2000). In the following, we describe these strategies in further detail and provide examples for their application in the work context.

Elective selection
Elective selection involves the extent to which individuals set and prioritize goals to achieve a desired state (Freund & Baltes, 2000). A key aspect of elective selection is the choice of a small number of goals rather than pursuing several goals at the same time. Individuals who engage in elective selection develop specific goals that are prioritized over others based on importance, urgency, or preference. For example, an employee may decide to focus on an important project deadline instead of attending a staff meeting.

Loss-based selection
Loss-based selection entails disengaging from unattainable goals, selecting new goals, and reorganizing goal priorities in the face of resource losses (Freund & Baltes, 2000). Loss-based selection occurs when individuals cannot pursue certain goals anymore given their available internal and external resources. Moreover, individuals use loss-based selection when a lack of relevant resources cannot be compensated through the acquisition of other resources. For example, construction workers with physical health problems may focus on coordinating the work of their team instead of doing the heavy physical work themselves.

Optimization
Optimization involves allocating personal resources such as time, effort, and knowledge to attain goals (Freund & Baltes, 2000). It further comprises the acquisition, refinement, use, and possibly re-activation of necessary resources to achieve selected goals. Individuals engaging in high levels of optimization practice their skills in a deliberate way, show persistence, model successful others, and seize the right moment to act. For example, employees may participate in a series of training workshops to improve their leadership skills.

Compensation
Compensation encompasses the acquisition and use of new internal and external resources, as well as the re-activation of unused resources, to achieve a goal when previously used resources are no longer available (Freund & Baltes, 2000). Thus, compensation helps individuals maintain functioning after experiencing resource losses. For instance, an older employee may compensate for a loss of physical strength by asking others for help.

Dynamic nature of SOC and relationships among the SOC components
As any form of behavior, SOC strategy use varies dynamically within persons over time. In addition, people differ from each other with regard to their average level of SOC strategy use. The vast majority of research has focused on between-person differences in SOC strategy use at work. However, in recent years, a few studies on within-person variation in SOC strategy use have emerged (e.g., Zacher, Chan, Bakker, & Demerouti, 2015). Furthermore, SOC

researchers proposed that the four strategies are used in a synchronized and coordinated way (P. B. Baltes & Baltes, 1990) and represent "one combined and orchestrated process" (Freund & Baltes, 2000, p. 53). Consistently, organizational researchers have argued that SOC strategies "should be considered as a functional set" (Young, Baltes, & Pratt, 2007, p. 514). Empirical research has shown that the four SOC components are distinct, moderately positively related, and, in combination, form a higher order construct (B. B. Baltes & Heydens-Gahir, 2003; Wiese, Freund & Baltes, 2000).

Antecedents of SOC strategy use

Figure 1 provides an overview of the antecedents and outcomes of SOC strategy use that we identified in the systematic review; in the meta-analysis, we included only variables that were examined in at least five independent samples. Theoretically speaking, both person and contextual antecedents predict SOC strategy use at work (Zacher & Frese, 2011). With regard to person antecedents, two key variables are age and job tenure. As the SOC model originates from the lifespan literature, these time-related variables are often considered as predictors of SOC strategy use. Specifically, researchers proposed that SOC strategies can help older workers cope with age-related declines in certain personal resources (e.g., physical strength), and, therefore, older workers should have a stronger need to use SOC strategies to maintain effective functioning and well-being than young workers (Abraham & Hansson, 1995; Zacher, 2015).

Furthermore, as shown in Figure 1, certain personality characteristics, self-related beliefs, and affective traits may predict SOC strategy use at work (Freund & Baltes, 2000; Wiese, Freund, & Baltes, 2000; Yeung & Fung, 2009). For instance, employees with high levels of conscientiousness, self-efficacy, internal locus of control, and positive affectivity are generally more likely to set goals for themselves and pursue them persistently, and, therefore, they should use SOC strategies more often (Bajor & Baltes, 2003; Wiese et al., 2000). Additional person antecedents that have been linked theoretically to SOC strategy use are subjective physical health, energy level, future time perspective, and promotion focus (B. B. Baltes, Wynne, Sirabian, Krenn, & Lange, 2014; Müller, De Lange, Weigl, Oxfart, & Van der Heijden, 2013; Venz & Sonnentag, 2015). The reason for assuming relationships between these factors and SOC strategy use is that employees should be more likely to use, and benefit from, SOC strategies when their personal resources are limited.

Two important contextual characteristics that may necessitate or facilitate SOC strategy use at work are job demands and job autonomy, respectively (Figure 1). Employees should be more likely to use SOC strategies when job demands are high (Schmitt, Zacher, & Frese, 2012). In jobs with low demands, it is relatively easy to pursue multiple goals without using SOC strategies. In contrast, when job demands are high, employees need to adapt their goals and invest additional resources to achieve them. In addition, SOC strategy use should be facilitated by high levels of job autonomy (Weigl, Müller, Hornung, Zacher, & Angerer, 2013). Job autonomy provides employees with the discretion to select their goals and to invest available resources on the basis of their preferences rather than following rigid work routines that leave little room for SOC strategy use. Additional, less frequently examined contextual antecedents of SOC strategy use are task difficulty and job complexity, learning and development opportunities, perceived supervisor support, and human resource management practices (Figure 1; Bal, Kooij, & De Jong, 2013; Weigl, Müller, Hornung, Leidenberger, & Heiden, 2014; Wiese & Heidemeier, 2012; Yeung & Fung, 2009). The theoretical rationales for assuming positive links between these contextual antecedents and SOC strategy use are that these factors should either necessitate or facilitate engagement in goal selection and strategies for effective goal pursuit.

Outcomes of SOC strategy use

The use of SOC strategies helps individuals to adapt to high demands and limited resources and, consequently, should result in effective functioning and improved well-being (P. B. Baltes & Baltes, 1990; Freund & Baltes, 2000). Selecting and prioritizing task-relevant goals, optimizing the means and resources to achieve these goals,

and, if necessary, compensating for lost resources presumably leads to the achievement of work goals and, consequently, to increased job performance and occupational well-being (Figure 1; Bajor & Baltes, 2003; Venz & Sonnentag, 2015). Employees who use SOC strategies should perform better on the job because they adapt to high demands and deliberately invest their limited resources in an optimal way to achieve their work goals. Moreover, when employees perceive themselves as efficient and effective in pursuing their work goals, their occupational well-being (e.g., job satisfaction and job engagement) should improve and their job-related strain should decrease (Abraham & Hansson, 1995; Schmitt et al., 2012). Using similar theoretical rationales, researchers have proposed that the use of SOC strategies may also positively impact on other important work-related outcomes, such as subjective and objective career success, intention to remain in bridge employment, a focus on opportunities at work, and work ability (Figure 1; Abele & Wiese, 2008; Müller et al., 2013; Riedel, Müller, & Ebener, 2015; Zacher & Frese, 2011).

Empirical research on SOC strategy use at work

Measurement

Abraham and Hansson (1995) developed the first measure of SOC strategy use in the work context. However, with one exception (Bal et al., 2013), their 24-item self-report questionnaire has not been used in other studies. Instead, most organizational researchers rely on the original or adapted versions of a SOC questionnaire developed by P. B. Baltes, Baltes, Freund, and Lang (1999; also Freund & Baltes, 2002). Both the long version (49 items) and the short version (12 items) of this questionnaire cover all four SOC components. The items are preceded by either general or domain-specific instructions (e.g., work and family life). Each item consists of two response options, one representing a SOC strategy and the other a non-SOC behavior. Respondents are instructed to first choose the answer that represents their own behavior best and, subsequently, to rate the degree of similarity with their behavior on a continuous scale. An example item is "I always focus on the one most important goal at a given time" (SOC strategy: elective selection) versus "I am always working on several goals at once" (non-SOC behavior). For practical reasons, the short 12-item version (sometimes reduced to nine items) has been used most often (e.g., B. B. Baltes & Heydens-Gahir, 2003; Shang et al., 2015). Some researchers changed the response format by only rating the SOC strategy answers on Likert-type scales (e.g., Zacher & Frese, 2011). Finally, Müller, Weigl, Heiden, Glaser, and Angerer (2012) expressed concerns about the applicability of the SOC questionnaire to physically demanding work and developed a more specific "SOC in nursing" scale based on qualitative interviews with job incumbents.

Reporting

Results on SOC strategy use at work are reported in four different ways in the literature. First, consistent with the notion of SOC as a coordinated ensemble of strategies (P. B. Baltes & Baltes, 1990), some researchers only report one overall SOC score (e.g., Weigl et al., 2014; Zacher & Frese, 2011). Second, some researchers report separate scores for each of the four components, sometimes in addition to the overall score (e.g., Demerouti, Bakker, & Leiter, 2014; Yeung & Fung, 2009). Third, some researchers report three scores: a combined score for elective and loss-based selection and two separate scores for optimization and compensation (e.g., Wiese, Freund & Baltes, 2002; Zacher et al., 2015). Finally, some researchers report scores for only one or two of the SOC components (e.g., Abele & Wiese, 2008).

Method

We first describe the methods of the systematic review, followed by a description of the meta-analytic approach. In the systematic review, we examined relationships between SOC strategy use and all identified antecedent and

outcome variables. In the meta-analysis, we focused on those variables that were studied in at least five independent samples (Figure 1).

Systematic review

Inclusion and exclusion criteria

We set four inclusion/exclusion criteria before conducting our literature search. First, articles had to be published or in press between 1990, the year in which P. B. Baltes and Baltes introduced the SOC model, and January 2016. Second, we included only quantitative-empirical studies on SOC strategy use at work and excluded review articles and articles using exclusively theoretical and qualitative approaches, as well as articles on SOC strategy use outside the work domain. Third, SOC strategy use at work had to be measured in the study. Finally, we included only studies with samples of (self-)employed, working adults; studies that sampled adolescents, students, or non-working adults were excluded.

Literature search

We searched the electronic databases EBSCOHost, Emerald, Google Scholar, JSTOR, ProQuest, PsycINFO, ScienceDirect, and Web of Science, using the following keywords: selection or selective, optimization, compensation, and SOC. Furthermore, we examined the reference lists of all retrieved articles, and we conducted a search of all studies that cited each retrieved article, to locate additional literature. Our search yielded a total of 130 articles on the SOC model. In a second step, we selected all quantitative-empirical studies on SOC strategy use in the work context from this initial set of articles by carefully examining the title, abstract, and keywords of each article. We excluded reviews and exclusively theoretical articles (e.g., B. B. Baltes & Rudolph, 2013; Müller & Weigl, 2015) and two qualitative studies (Philipp & Kunter, 2013; Unson & Richardson, 2013). Additionally, we excluded an empirical study by Unger, Sonnentag, Niessen, and Kuonath (2015), in which the authors examined associations between SOC strategy use in private life only (rather than SOC strategy use at work), and its associations with working time and intimate relationship outcomes among dual-career couples. We also excluded a randomized controlled intervention study that did not measure SOC strategy use but rather investigated the effects of SOC training on nurses' well-being, perceived work ability, and job control (Müller, Heiden, Herbig, Poppe, & Angerer, 2015). Finally, to obtain articles in press, we contacted researchers who have published previously on SOC strategy use at work, and we requested articles using professional mailing lists. Our literature search resulted in a final set of 26 articles (Table 1).

Meta-analysis

Inclusion and exclusion criteria

We used the set of 26 empirical articles included in our systematic review as a starting point for our meta-analysis and set four additional inclusion/exclusion criteria. First, we included only studies that, in addition to SOC strategy use, measured other person characteristics (e.g., age), contextual variables (e.g., job autonomy), and/or work outcomes (e.g., job satisfaction). Second, to avoid double counting, we excluded studies in which authors used the same dataset and reported the same correlations as in previously published studies. Whenever longitudinal analyses were reported, we included relationships based on Time 1 data only. Third, consistent with the vast majority of organizational research on SOC strategy use, we adopted a between-person approach in the meta-analysis and, therefore, included baseline survey data or aggregated daily data from the few available experience sampling studies. Finally, when an article reported results obtained from multiple independent samples, each sample was included in the meta-analysis.

Table 1. Empirical studies on SOC strategy use at work published over the past two decades (in chronological order, and within years in alphabetical order).

Authors and year	Sample[a] and design	Reporting[b]	Antecedents of SOC	Outcomes of SOC
1. *Abraham and Hansson (1995)	224 employees, 40–69 years, cross-sectional	4: Developed scale with 3 components	Age,[c] job latitude,[c] job stressors[c]	Self-reported performance/ ability maintenance,[c] job satisfaction,[c] goal attainment
2. *Wiese et al. (2000)	206 young professionals, 25–36 years, cross-sectional	2	Age,[c] Big Five personality traits, self-esteem, control beliefs, emotional balance	Indicators of global and domain-specific well-being, including job satisfaction,[c] self-reported work success[c]
3. Wiese, Freund and Baltes (2002)	82 young professionals, 28–39 years, two-wave study, follow-up of [2]	2		Indicators of global and domain-specific well-being, including job satisfaction, self-reported work success
4. *Bajor and Baltes (2003)	226 employees at a financial institution, mean age 43 years, cross-sectional	1	Age,[c] job tenure,[c] autonomous goal setting,[c] conscientiousness	Job performance (supervisor rating)[c]
5. *Baltes and Heydens-Gahir (2003)	241 employees with a partner and/or a child, 21–64 years, cross-sectional	1, 3	Job stressors[c]	Job involvement, work-in-family conflict, family-in-work conflict
6. *Young et al. (2007)	260 employees, 21–64 years, cross-sectional, sample overlap with [5], but additional findings	1	Age,[c] job tenure,[c] job stressors, perceived supervisor support	Job involvement
7. Abele and Wiese (2008)	1185 professionals, mean age 34 years, cross-sectional	4: Only S and O reported		Subjective and objective career success
8. *Yeung and Fung (2009)	Study 1: 355 insurance sales employees, 18–64 years, cross-sectional Study 2: 87 insurance sales employees, 18–61 years, 5-day experience sampling study	3	Age,[c] job control,[c] task difficulty, subjective health, emotional intelligence	Performance maintenance (self-report),[c] sales productivity (objective measure of performance),[c] job satisfaction[c]

(*Continues*)

Table 1. (Continued)

Authors and year	Sample[a] and design	Reporting[b]	Antecedents of SOC	Outcomes of SOC
9. Baltes et al. (2011)	289 employees with a partner and/or a child, mean age 38 years, cross-sectional	1, 3	Conscientiousness, agreeableness, emotional stability, locus of control, negative affectivity	Work interference with family, family interference with work
10. *Zacher and Frese (2011)	133 manufacturing, 16–65 years, cross-sectional	1	Age,[c] subjective health, positive affectivity, job complexity	Focus on opportunities
11. *Müller et al. (2012)	438 nurses, 21–63 years, cross-sectional	1	Age,[c] job tenure,[c] job control[c]	Work ability
12. *Schmitt et al. (2012)	64 university employees, 20–62 years, daily diary study	1	Age,[c] problem-solving demands,[c] negative affectivity	Job satisfaction,[c] fatigue[c]
13. *Wiese and Heidemeier (2012)	267 employed mothers, 20–53 years, longitudinal	4: 7 items from Baltes et al. (1999)	Self-efficacy, perceived supervisor support	Job strain,[c] work adjustment over time
14. *Bal et al. (2013)	1058 healthcare employees, mean age 43 years, cross-sectional	4: Abraham and Hansson's (1995) scale	Age,[c] accommodative HRM practices, developmental HRM practices	Work engagement,[c] affective commitment
15. *Müller et al. (2013)	784 temporary employees, 60–85 years, cross-sectional	1, 3	Age,[c] subjective physical health	Intention to remain in bridge employment
16. *Müller et al. (2013)	Study 1: 17 nurses, ≥45 years, qualitative study Study 2: 438 nurses, 21–63 years, cross-sectional, same sample as [11], but additional findings	1	Age, job tenure, job control, physical work stressors[c]	Work ability
17. *Weigl et al. (2013)	173 healthcare employees, 17–60 years, cross-sectional	1	Age,[c] job control[c]	Work ability (supervisor rating)
18. Baltes et al. (2014)	784 temporary employees, mean age 69 years, longitudinal (three waves)	1	Future time perspective, promotion focus	
19. *Demerouti et al. (2014)	294 employees, mean age 36 years, cross-sectional	3	Age[c]	Job performance (supervisor rating),[c] emotional exhaustion,[c] disengagement, adaptivity to change

(Continues)

Table 1. (Continued)

Author and year	Sample[a] and design	Reporting[b]	Antecedents of SOC	Outcomes of SOC
20. *von Bonsdorff et al. (2014)	605 nurses and therapists, 20–64 years, cross-sectional	1	Age,[c] organizational justice	Work ability
21. *Weigl et al. (2014)	118 flight attendants, 20–57 years, cross-sectional	1	Age,[c] job control,[c] learning and development opportunities	Job engagement[c]
22. *Baethge et al. (2015)	136 nurses, 21–61 years, daily diary study	4: SOC in nursing scale	Age,[c] workload[c]	Self-reported performance quality,[c] forgetting of intentions
23. *Riedel et al. (2015)	6057 employees born in 1959 or 1965, cross-sectional	1, 3	Quantitative job demands,[c] decision authority[c]	Work ability
24. Shang et al. (2015)	2457 employees, 20–55 years, cross-sectional	4: 9-Item version		Depressive symptoms
25. Venz and Sonnentag (2015)	405 employees including a multi-source subsample of 141 employees, mean age 43 years, cross-sectional	1	Age,[c] job control,[c] positive affectivity, energy level in the morning	Self-rated job engagement,[c] co-worker-rated job engagement
26. *Zacher et al. (2015)	77 employees, 19–70 years, daily diary study	2		Job engagement[c]

Note: Studies with an asterisk are included in the meta-analysis. SOC = selection, optimization, compensation; HRM, human resource management.
[a]Age range of the sample is provided whenever available; otherwise, mean age is reported.
[b]Reporting: 1 = overall SOC strategy use; 2 = 3 SOC components; 3 = 4 SOC components; 4 = other.
[c]Variable was included in the meta-analysis.

Literature search

Based on our criteria, 20 independent samples from published or in press articles were included in the meta-analysis (studies marked with an asterisk in Table 1). In a second step, we contacted researchers via professional mailing lists and directly via e-mail to obtain unpublished manuscripts, conference presentations, conference posters, and dissertations, which led to the inclusion of 10 additional samples and one dataset that had been partly published but contained additional relevant data for our meta-analysis (Table 2). Thus, a total of 30 samples were included in the meta-analysis.

Measures of key constructs

We meta-analyzed relationships between overall SOC strategy use and those antecedent and outcome variables that were included in at least five independent samples. We focused on overall SOC strategy use, as most studies reported an overall score, whereas only very few studies reported SOC component scores for the same antecedent or outcome variable. When studies did not report an overall SOC strategy use score but relationships for three (i.e., including a combined selection score) or four (i.e., including elective and loss-based selection) SOC components, we combined effect sizes within studies by averaging correlations across SOC components into

Table 2. Unpublished empirical studies on SOC strategy use at work.

Unpublished study no.	Sample[a] and design	Reporting[b]	Antecedents of SOC	Outcomes of SOC
Study 1	64 architects, 32–86 years, daily diary study	1	Age, job control, job stressors	Job performance (self-report), job satisfaction, job strain
Study 2	113 hospital staff, 22–59 years, cross-sectional	1, 3	Age, job control	
Study 3	667 young professionals, 40–65 years, cross-sectional	1	Age, job tenure	Job engagement
Study 4	138 employees, mean age 32.7 years, daily diary study	1	Age, job control	Job engagement
Study 5	119 teachers, 23–58 years, cross-sectional	1	Age, job control	In-role performance (co-worker rating)
Study 6	69 employees, 21–61 years, daily diary study	1, 3	Age, job tenure, job demands, job autonomy	Task performance (self-report), job satisfaction
Study 7	63 aged care employees, 17–70 years, cross-sectional	1, 3	Age, job tenure, job demands, job autonomy	Overall work performance (self-report), job satisfaction, job engagement, emotional exhaustion
Study 8	953 employees, 18–83 years, longitudinal	1, 3	Age, job tenure, job autonomy	Job satisfaction, job engagement, emotional exhaustion
Study 9	1796 employees, 18–76 years, longitudinal	1, 3	Age, job tenure, job demands, job autonomy	Task performance (self-report), job satisfaction, job engagement, emotional exhaustion
Study 10	127 professional artists, 17–79 years, longitudinal	1, 3	Age, job tenure	Task performance (self-report), job satisfaction, job engagement, negative job-related affect
Study 11	85 employees, 22–64 years, daily diary study	1, 3	Age, job tenure, work overload, job autonomy	Task performance (self-report), job satisfaction, job engagement, emotional exhaustion

Note: All studies and all antecedent and outcome variables listed in this table were included in the meta-analysis. SOC = selection, optimization, compensation.
[a]Age range of the sample is provided whenever available; otherwise, mean age is reported.
[b]Reporting: 1 = overall SOC strategy use; 2 = 3 SOC components; 3 = 4 SOC components; 4 = other.

a composite score that represents the relationship between overall SOC strategy use and other variables (Hunter & Schmidt, 2004).

In the meta-analysis, we examined relationships between SOC strategy use and four antecedents: age, job tenure, job demands, and job autonomy (Figure 1). In the studies, *age* and *job tenure* were measured in years. *Job demands* were operationalized as self-reported quantitative job demands or role stressors, and *job autonomy* was measured as self-reported job autonomy, control, or decision latitude. With regard to outcomes of SOC strategy use, we focused on job performance, job satisfaction, job engagement, and job strain (Figure 1). *Overall job performance* combined self-reported and non-self-reported data on employees' core task performance; note that we applied our inclusion criterion of at least five independent samples to overall job performance, but not to self-reported and non-self-reported job performance. *Self-reported job performance*, *job satisfaction*, and *job engagement* were measured with self-report scales for these constructs. *Non-self-reported job performance* included supervisor reports, co-worker reports, and archival measures (e.g., sales volume). Finally, for *job strain*, we included measures of work-related strain, emotional exhaustion, and fatigue.

Meta-analytical procedures

We corrected the combined correlations for sampling and measurement error using Hunter and Schmidt's (2004) technique. First, we corrected for sampling error by calculating the sample size-weighted correlations. Second, we corrected all variables except for age and job tenure for the lack of perfect reliability. If a study did not report the reliability estimate for a construct, we used the average of the reliability estimates for that construct from the other samples included in the meta-analysis. In addition to the sample size-weighted correlation (r) and the sample size-weighted and reliability-corrected correlation (r_c), we report the 95 percent confidence interval and the 90 percent credibility interval for r_c, as well as the variance attributable to sampling error (% var SE). A sample size-weighted and reliability-corrected correlation is considered significant if the confidence interval does not include zero. If a credibility interval includes zero, moderators are likely present (Geyskens, Krishnan, Steenkamp, & Cunha, 2009). The more conservative 75 percent rule by Hunter and Schmidt suggests that % var SE values below 75 indicate that moderators are likely present.

We compared correlations from published (coded as 1) and unpublished studies (coded as 0) to examine the possibility of file drawer effects (i.e., the observation that studies reporting significant relationships are more likely to be published than studies reporting nonsignificant relationships; Rosenthal, 1979). Furthermore, the strength of the relationship between age and SOC strategy use may depend on the age distribution in the sample. We therefore examined range restriction in age, as well as sample mean age and standard deviation of age as moderators of the relationship between age and SOC strategy use. To operationalize range restriction in age, we used an age range of 40 years as cutoff score to distinguish studies that included young, middle-aged, and older employees from those that included only one or two of these age groups. Eight studies reported an age range smaller than 40 years (coded as 0), and 16 studies reported an age range of 40 years or more (coded as 1; six studies did not report the age range in the sample). For all moderation analyses, we used the recommended weighted least squares regression approach to meta-analytic moderator estimation (Steele & Kammeyer-Mueller, 2002).

Results

Table 1 provides an overview of studies included in the systematic review. Studies marked with an asterisk were included in the meta-analysis. Table 2 provides an overview of the unpublished studies included in the meta-analysis. Table 3 shows the results of the meta-analysis, and Table 4 summarizes the results of the systematic review. In the following, we first focus on between-person differences in SOC strategy use, and their associations with antecedents and outcomes. As shown in Figure 1, we categorized antecedents into person and contextual antecedents, and outcomes into job performance, occupational well-being, and other work-related outcomes. For each construct,

Table 3. Meta-analytical relationships between use of SOC strategies (overall SOC strategy use score), antecedents, and outcome variables.

Variable	k^a	N	r	r_c	SD_c	95% CI	90% CV	% var SE
				Antecedents				
Age	27 (16)	9613	.038	.043[b]	0.078	0.014, 0.073	−0.051, 0.138	46
Job tenure	10 (3)	4617	−.006	−.005	0.076	−0.123, 0.113	−0.104, 0.094	37
Job demands	11 (6)	9212	−.004	−.016	0.076	−0.061, 0.029	−0.128, 0.096	21
Job autonomy	17 (8)	11380	.125	.165[b]	0.101	0.117, 0.214	0.011, 0.320	14
				Outcomes				
Job performance[c]	13 (6)	3749	.175	.213[b]	0.096	0.161, 0.265	0.085, 0.340	35
Self-report	10 (4)	3110	.191	.230[b]	0.080	0.180, 0.280	0.132, 0.328	45
Non-self-report	4 (3)	994	.167	.208[b]	0.140	0.071, 0.345	−0.001, 0.416	19
Job satisfaction	11 (4)	4001	.210	.253[b]	0.085	0.203, 0.304	0.139, 0.367	33
Job engagement	11 (4)	5385	.335	.377[b]	0.123	0.304, 0.450	0.185, 0.570	10
Job strain	9 (3)	3719	.009	.008	0.080	−0.044, 0.060	−0.095, 0.111	38

Note: k, cumulative number of studies; N, cumulative sample size; r, sample-sized weighted correlation; r_c, sample size-weighted and reliability-corrected correlation; SD_c, standard deviation of r_c; CI, confidence interval for r_c; CV, credibility interval for r_c; % var SE, variance attributable to sampling error; SOC = selection, optimization, compensation.
[a]Numbers in parentheses indicate number of published studies.
[b]CIs do not include zero.
[c]One study included both self-reported and non-self-reported job performance; the correlation including self-reported job performance from this study was excluded when calculating the correlation for overall job performance.

we first report meta-analytical results (if available) and then describe results of the systematic review. Subsequently, we review research on SOC strategy use as a mediator and moderator variable, as well as longitudinal and experience sampling studies on within-person changes and variability in SOC strategy use.

Person antecedents of SOC strategy use

Age and job tenure
The meta-analysis indicated that the relationship between age and SOC strategy use was positive and significant, albeit very weak ($r_c = .043$), and that the relationship was likely to be moderated. There was no significant difference between published ($r_c = .028$) and unpublished studies ($r_c = .063$; $Z = −1.55$, $p = .122$). The average age across the included samples was 43.60 years (average $SD = 10.48$ years, range = 16–86 years). The relationship between age and SOC strategy use was not moderated by range restriction in age ($Z = 0.22$, $p = .982$), sample mean age ($Z = 1.46$, $p = .145$), and standard deviation of age in the sample ($Z = 0.04$, $p = .967$).

The systematic review showed that the relationship between age and SOC strategy use was positive ($r = .22$, Müller, Weigl, Heiden, Glaser, & Angerer, 2012; $r = .21$, Young et al., 2007), nonsignificant (Abraham & Hansson, 1995; Baethge, Müller, & Rigotti, 2015; Bajor & Baltes, 2003; Schmitt et al., 2012; Venz & Sonnentag, 2015; von Bonsdorff et al., 2014; Weigl et al., 2013; Weigl et al., 2014; Zacher & Frese, 2011), or varied by the specific SOC component ($r = .08$ for selection and rs = −.13 for both optimization and compensation, Bal et al., 2013; $r = .11$ for optimization and $r = −.26$ for compensation, Demerouti et al., 2014; $r = .09$ for compensation, Müller et al., 2013; $r = .15$ for selection and $r = −.13$ for compensation, Wiese et al., 2000; $r = .15$ for elective selection and $r = .12$ for optimization, Yeung & Fung, 2009).

The meta-analysis showed that job tenure was not significantly related to SOC strategy use ($r_c = −.005$), and that moderators are likely to be present. The moderation analysis detected a significant difference between published ($r_c = .086$) and unpublished studies ($r_c = −.026$; $Z = 2.66$, $p = .008$). However, for both published and unpublished studies, the weighted and corrected correlations were not significant. The systematic review revealed that none of

Table 4. Summary of systematic review findings on SOC strategy use at work.

Antecedent/outcome category	Summary of findings
	Person antecedents of SOC strategy use
Demographic characteristics	• Relationships between age and SOC were positive (6, 11), nonsignificant (1, 4, 10, 12, 17, 20, 21, 22, 25), or varied by SOC component (2, 8, 14, 15, 19). • No significant relationship between job tenure and SOC (4, 6, 11).
Personality characteristics	• Positive relationships of SOC with conscientiousness (2, 4, 9), extraversion (2), and emotional stability (2, 9). • Positive (9) or nonsignificant (2) relationships between agreeableness and SOC. • No significant relationship between openness to experience and SOC (2).
Self-related beliefs	• Positive relationships of SOC with self-esteem (2) and self-efficacy (13). • Positive relationship between internal control beliefs and SOC (2), and negative relationships between external control beliefs and SOC (2, 9).
Affective traits	• Positive relationships between positive affectivity and SOC (10, 25). • Negative (9) or nonsignificant (12) relationships between negative affectivity and SOC. • Positive relationships of SOC with emotional balance (2) and emotional intelligence (8).
Other person antecedents	• Positive (8) or nonsignificant (10, 15) relationships between subjective physical health and SOC. • No significant relationships of energy level (25), future time perspective and promotion focus (18) with SOC.
	Contextual antecedents of SOC strategy use
Job characteristics	• Job demands were positively related to selection and compensation (1), or negatively (5, 16) or nonsignificantly (12, 22) related to overall SOC, or varied by SOC component (23). • Relationships between job autonomy and SOC were positive (4, 8, 11, 21, 25), nonsignificant (1, 17), or varied by SOC component (23). • Negative relationship between task difficulty and SOC (8). • Positive relationships between job complexity (10) and learning and development opportunities (21) and SOC. • No significant relationships between perceived supervisor support and SOC (5, 13).
Organizational characteristics	• No significant relationships between human resource management practices and SOC (14).
	Outcomes of SOC strategy use
Performance outcomes	• Relationships between SOC and self-reported performance were either positive (8, 22), or only positive for optimization (1, 2) and compensation (2). • Relationships between SOC and non-self-reported performance were either positive (4, 8), or negative for elective selection and non-self-reported performance (19). • Positive association between SOC and self-reported goal attainment (1).
Occupational well-being outcomes	• Relationships between SOC and job satisfaction were positive (8, 12), nonsignificant (1), or varied by SOC component (2). • Relationships between SOC and job engagement were either positive (21, 25, 26) or varied by SOC component (14). • Negative relationship between SOC and fatigue (12), and nonsignificant relationships of SOC with job strain and emotional exhaustion (13, 19). • Positive association between job involvement and SOC (5). • Positive relationships of optimization and compensation with affective commitment (14). • Negative relationships of SOC with perceived work-in-family conflict and family-in-work conflict (5, 9). • Negative effect of SOC on depressive symptoms (24).
Other work-related outcomes	• Positive relationships of optimization and compensation (2) and of selection and optimization (7) with subjective career success. • Positive relationship between optimization and objective career success (7). • Nonsignificant relationship between SOC and intention to remain in bridge employment (15). • Nonsignificant relationship between SOC and focus on opportunities (10). • Positive (11, 23) and nonsignificant (17, 20) relationships between SOC and work ability.

(*Continues*)

Table 4. (Continued)

Antecedent/outcome category	Summary of findings
	SOC strategy use as a mediator
Occupational well-being outcomes	• SOC mediated the negative relationships of conscientiousness and agreeableness with perceived work–family conflict (9).
	• SOC mediated the positive relationships of job control and development opportunities with work engagement (21).
Other work-related outcomes	• SOC mediated the positive relationship between perceived organizational justice and work ability when controlling for age (20).
	SOC strategy use as a moderator
Performance outcomes	• SOC was negatively related to objective job performance among older employees when task difficulty was high and among young employees when task difficulty was low (8).
	• Compensation was positively related to supervisor-rated job performance among disengaged employees, while high selection was related to lower adaptivity to change among emotionally exhausted employees (19).
Occupational well-being outcomes	• SOC was positively related to job engagement among employees with low energy level in the morning (25).
	• SOC was positively related to work adjustment after reentry among working mothers with high, but not low, self-efficacy beliefs (13).
	• SOC buffered the negative relationship between effort–reward imbalance and depressive symptoms (24).
Other work-related outcomes	• SOC was positively related to intention to remain in bridge employment among employees with low but not high levels of physical health (15).
	• SOC buffered the negative relationship between age and focus on opportunities in low-complexity but not high-complexity jobs (10).
	• SOC buffered the negative relationship between age and supervisor-rated work ability in high-autonomy but not low-autonomy jobs (17).
	• SOC was positively related to work ability in high-autonomy jobs (23).
	Results of longitudinal and experience sampling studies
Person antecedents	• Promotion focus at Time 2 positively predicted change in SOC over time and mediated the positive relationship between future time perspective at Time 1 and SOC strategy use at Time 3 (18).
Performance outcomes	• SOC at Time 1 did not predict job performance at Time 2 (3).
	• Older employees' daily use of elective selection was positively associated with daily subjective task performance, especially when they worked on easy tasks. Young employees showed greater objective task performance when they used SOC strategies and worked on tasks with medium or high difficulty (8).
	• The negative relationship between daily workload and daily performance quality and the positive relationship between daily workload and daily "forgetting of intentions" were less pronounced among nurses with high general SOC strategy use (22).
Occupational well-being outcomes	• SOC at Time 1 positively predicted job satisfaction at Time 2 (3).
	• Positive within-person relationship between daily SOC and job satisfaction (12).
	• SOC strategy use predicted work adjustment of mothers after maternity leave over and above self-efficacy beliefs (13). SOC strategy use increased with time (up to 6 months) after maternity leave.
	• Daily SOC buffered the negative within-person relationship between daily problem-solving demands and daily fatigue (12).
	• Daily optimization and compensation, but not selection, were positively related to daily job engagement at the within-person level; daily selection was only positively associated with daily job engagement when daily optimization and compensation were high; daily selection was negatively associated with daily job engagement when daily optimization was low and daily compensation was high (26).

Note: Numbers in parentheses correspond to numbers of references listed in Table 1. SOC = selection, optimization, compensation.

the three published studies reporting associations between job tenure and SOC strategy use found significant relationships (Bajor & Baltes, 2003; Müller et al., 2012; Young et al., 2007).

Personality characteristics, self-related beliefs, and affective traits

An insufficient number of studies were available to meta-analyze associations between these person antecedents and SOC strategy use (Table 1). However, the systematic review identified a number of relevant relationships. Bajor and Baltes (2003) found a positive relationship between conscientiousness and SOC strategy use ($r = .39$). In a later study, B. B. Baltes, Zhdanova, and Clark (2011) reported that SOC strategy used was associated not only with conscientiousness ($r = .43$) but also with emotional stability ($r = .15$) and agreeableness ($r = .32$). Wiese et al. (2000) also found that conscientiousness related positively to selection ($r = .41$), optimization ($r = .49$), and compensation ($r = .40$). These authors further reported positive associations of extraversion with optimization ($r = .20$) and compensation ($r = .23$), but no significant association with selection. Emotional stability was positively related to selection ($r = .16$), optimization ($r = .29$), and compensation ($r = .32$). Finally, no significant associations were found for agreeableness and openness to experience (Wiese et al., 2000).

With regard to self-related beliefs, Wiese et al. (2000) reported positive links between self-esteem and selection ($r = .14$), optimization ($r = .22$), and compensation ($r = .17$), and Wiese and Heidemeier (2012) observed a positive relationship between self-efficacy and overall SOC strategy use ($r = .25$). Wiese et al. further found that internal control beliefs were positively related to selection ($r = .22$) and optimization ($r = .26$), but unrelated to compensation. With regard to external control beliefs, control beliefs regarding powerful others were negatively related to optimization ($r = -.22$) and compensation ($r = -.21$) but not significantly related to selection. External control beliefs regarding chance were positively related to selection ($r = .15$) and negatively related to optimization ($r = -.24$) and compensation ($r = -.21$). Consistently, B. B. Baltes et al. (2011) found that overall SOC strategy used was negatively related to external locus of control ($r = -.31$).

Regarding affective traits, positive relationships were found between positive affectivity and SOC strategy use by Zacher and Frese (2011; $r = .25$) and by Venz and Sonnentag (2015; $r = .18$), whereas negative affectivity was found to be negatively related ($r = -.36$; B. B. Baltes et al., 2011) or unrelated to SOC strategy use (Schmitt et al., 2012). Wiese et al. (2000) found positive correlations between emotional balance (i.e., employees' negative affectivity score subtracted from their positive affectivity score) and selection ($r = .18$), optimization ($r = .27$), and compensation ($r = .31$). Finally, Yeung and Fung (2009) found that self-reported emotional intelligence was positively associated with elective selection ($r = .29$), loss-based selection ($r = .34$), optimization ($r = .38$), and compensation ($r = .33$).

Additional person antecedents

The systematic review showed that subjective physical health was not significantly related to overall SOC strategy use in two studies (Müller et al., 2013; Zacher & Frese, 2011), while Yeung and Fung (2009) found that subjective physical health was positively related to elective selection ($r = .29$), loss-based selection ($r = .20$), optimization ($r = .25$), and compensation ($r = .17$). Venz and Sonnentag (2015) reported a nonsignificant association between personal energy level in the morning and SOC strategy use. Finally, future time perspective and promotion focus were unrelated to overall SOC strategy use (B. B. Baltes et al., 2014).

Contextual antecedents of SOC strategy use

Job demands

The meta-analysis indicated that job demands were not significantly related to SOC strategy use ($r_c = -.016$), and that this relationship was likely to be moderated. There was no significant difference between published ($r_c = -.048$) and unpublished studies ($r_c = .095$; $Z = -0.23$, $p = .817$). The systematic review showed that job demands were positively ($r = .28$ for selection and $r = .22$ for compensation, Abraham & Hansson, 1995), negatively ($r = -.19$ for overall SOC strategy use, B. B. Baltes & Heydens-Gahir, 2003; $r = -.19$ for compensation, Müller et al., 2013), and

nonsignificantly (Baethge et al., 2015; Schmitt et al., 2012) related to SOC strategy use. Moreover, Riedel et al. (2015) found that job demands were negatively related to elective selection ($r = -.11$) and positively related to loss-based selection ($r = .05$). Some studies conceptualized job demands not as a predictor, but as an outcome of SOC strategy use. For instance, B. B. Baltes and Heydens-Gahir (2003) argued and found that SOC strategy use was associated with decreased job stressors, which, in turn, lead to lower work interference with family. Consistent results were also found in a later study (B. B. Baltes et al., 2011). However, as these studies used cross-sectional designs, causality cannot be established.

Job autonomy

The meta-analysis showed that job autonomy was positively related to SOC strategy use ($r_c = .165$). The 90 percent credibility interval did not include zero, but the more conservative 75 percent rule by Hunter and Schmidt (2004) suggested moderation. Unpublished studies reported stronger positive associations ($r_c = .269$) than published studies ($r_c = .121$; $Z = -7.52$, $p < .001$). Most studies in the systematic review, consistent with the meta-analysis, found positive relationships ($r = .16$, Bajor & Baltes, 2003; $r = .13$ for selection, $r = .10$ for optimization, and $r = .20$ for compensation, Müller et al., 2012; $r = .22$, Weigl et al., 2014; $r = .19$, Venz & Sonnentag, 2015; $r = .16$ for elective selection, $r = .18$ for loss-based selection, $r = .23$ for optimization, and $r = .20$ for compensation; Yeung & Fung, 2009), while two studies did not find significant associations between job autonomy and SOC strategy use (Abraham & Hansson, 1995; Weigl et al., 2013). One study found that results varied by the specific SOC component ($r = -.06$ for elective selection, $r = .08$ for loss-based selection, $r = .07$ for optimization, and $r = .09$ for compensation, Riedel et al., 2015).

Additional contextual antecedents

The systematic review identified several studies that examined additional job and organizational characteristics as antecedents of SOC strategy use. Yeung and Fung (2009) found that task difficulty related negatively to all four SOC strategies (βs between $-.40$ and $-.50$; correlations were not reported). In contrast, Zacher and Frese (2011) showed that job complexity was positively related to SOC strategy use ($r = .20$). Weigl et al. (2014) found that learning and development opportunities were also positively related to SOC strategy use ($r = .35$). In contrast, perceived supervisor support was not significantly related to overall SOC strategy use in two independent samples (B. B. Baltes & Heydens-Gahir, 2003; Wiese & Heidemeier, 2012). Finally, Bal et al. (2013) found weak positive relationships of compensation strategy use with employees' perceptions of accommodative ($r = .06$) and developmental human resource management practices ($r = .08$) in their organization.

Job performance outcomes

The meta-analysis showed that SOC strategy use is positively correlated with overall job performance ($r_c = .213$). The 90 percent credibility interval did not include zero, but the Hunter and Schmidt 75 percent criterion suggested moderation. There was no significant difference between published ($r_c = .221$) and unpublished studies ($r_c = .207$; $Z = 0.46$, $p = .645$). SOC strategy use was positively related to both self-reported performance ($r_c = .230$) and non-self-reported performance ($r_c = .208$). There was no significant difference between published ($r_c = .279$) and unpublished studies for self-reported performance ($r_c = .211$; $Z = 0.19$, $p = .851$); there was also no significant difference between the three published studies ($r_c = .216$) and the one unpublished study for non-self-reported performance ($r_c = .150$; $Z = -1.00$, $p = .317$).

 In the systematic review, we identified four published studies measuring self-reported job performance. Two studies reported positive relationships between the use of SOC strategies and self-reported performance ($r = .38$ for selection, $r = .25$ for optimization, and $r = .23$ for compensation, Baethge et al., 2015; $r = .30$ for elective selection, $r = .24$ for loss-based selection, $r = .35$ for optimization, and $r = .25$ for compensation, Yeung & Fung, 2009), one reported positive associations of optimization ($r = .24$) and compensation ($r = .20$) with self-reported performance (Wiese et al., 2000), and one found a positive relationship between optimization and self-reported performance maintenance ($r = .16$), as well as positive

relationships of selection ($r = .15$) and optimization ($r = .31$) with self-rated goal attainment (Abraham & Hansson, 1995). We further identified three published studies measuring non-self-reported performance. Positive associations between SOC strategy use and supervisor-rated performance were found by Bajor and Baltes (2003, $r = .32$) and Yeung and Fung (2009, $r = .21$ for elective selection, $r = .16$ for loss-based selection, $r = .28$ for optimization, and $r = .31$ for compensation). Finally, Demerouti et al. (2014) found a negative relationship between elective selection and supervisor-rated performance ($r = -.14$), and no significant relationships between the other SOC components and supervisor-rated performance.

Occupational well-being outcomes

Job satisfaction
The meta-analysis revealed that SOC strategy use was positively related to job satisfaction ($r_c = .253$). The 90 percent credibility interval did not include zero, but the Hunter and Schmidt criterion suggested moderation. Again, there was no significant difference between published ($r_c = .181$) and unpublished studies ($r_c = .273$; $Z = -1.26$, $p = .209$). The systematic review showed that the association between SOC strategy use and job satisfaction was typically positive ($r = .32$, Schmitt et al., 2012; $r = .20$ for elective selection, $r = .16$ for loss-based selection, $r = .27$ for optimization, and $r = .28$ for compensation, Yeung & Fung, 2009). Wiese et al. (2000) found positive links of job satisfaction with optimization ($r = .19$) and compensation ($r = .15$), but not with selection. Finally, Abraham and Hansson (1995) found nonsignificant relationships of job satisfaction with selection and optimization, and a negative relationship with impression management as a specific compensation strategy ($r = -.14$).

Job engagement
The meta-analyzed relationship between SOC strategy use and job engagement was positive ($r_c = .377$), and the 90 percent credibility interval did not include zero. In contrast, the Hunter and Schmidt criterion suggested moderation. Unpublished studies reported stronger positive associations ($r_c = .444$) compared with published studies ($r_c = .228$; $Z = -7.73$, $p < .001$). The systematic review suggested that the strength of the positive relationship varied substantially between the studies. Bal et al. (2013) found positive relationships of job engagement with optimization ($r = .21$) and compensation ($r = .15$) in a large-scale study of over 1000 employees. Weigl et al. (2014) found a stronger positive relationship in a sample of flight attendants ($r = .28$). For three SOC components, Zacher et al. (2015) reported positive relationships between daily SOC and job engagement ($rs = .25$, .51, and .48, respectively). Finally, Venz and Sonnentag (2015) found a positive relationship between SOC strategy use and self-rated job engagement ($r = .30$), as well as a nonsignificant association between SOC strategy use and co-worker-rated job engagement.

Job strain
Results of the meta-analysis showed a nonsignificant association between SOC strategy use and job strain ($r_c = .008$), which is likely to be moderated. There was no significant difference between published ($r_c = -.086$) and unpublished studies ($r_c = .027$; $Z = -0.98$, $p = .328$). Of the three published studies identified in our systematic review, one found a moderate negative relationship between SOC strategy use and fatigue ($r = -.31$, Schmitt et al., 2012), one found a nonsignificant relationship between overall SOC strategy use and job strain (Wiese & Heidemeier, 2012), and one found nonsignificant relationships between SOC components and emotional exhaustion (Demerouti et al., 2014).

Other well-being outcomes
B. B. Baltes and Heydens-Gahir (2003) found a positive relationship between SOC strategy use and job involvement ($r = .21$). Bal et al. (2013) reported that employees' affective commitment was positively associated with optimization ($r = .15$) and compensation ($r = .16$), but not with selection. B. B. Baltes and Heydens-Gahir found that only the use of elective selection was negatively associated with work-in-family conflict ($r = -.15$) and family-in-work conflict ($r = -.13$). B. B. Baltes et al. (2011) found negative relationships of using SOC strategies with work-in-family ($r = -.19$ for

elective selection, $r = -.29$ for loss-based selection, $r = -.28$ for optimization, and $r = -.29$ for compensation) and family-in-work conflict ($r = -.19$ for elective selection, $r = -.31$ for loss-based selection, $r = -.36$ for optimization, and $r = -.27$ for compensation). Finally, a recent study by Shang et al. (2015) reported that low levels of SOC strategy use were associated with more depressive symptoms (odds ratio = 1.67; no correlations were reported).

Other work-related outcomes

Owing to the small number of studies on SOC strategy use and other work-related outcomes, we report only results from the systematic review in this section. A few studies examined relationships between SOC strategy use and career-related outcomes. In a large-scale study with over 1000 participants, Abele and Wiese (2008) showed that selection and optimization were positively related to career satisfaction ($r = .09$ and $r = .18$, respectively), whereas only optimization was positively related to self-rated career success in relation to relevant others ($r = .17$) and to a measure of objective career success comprising pay, level of responsibility, and leadership position ($r = .08$; compensation was not included in the study). Müller et al. (2013) did not find a relationship between SOC strategy use and older employees' intention to remain in bridge employment. Finally, Zacher and Frese (2011) reported a nonsignificant relationship between SOC strategy use and focus on opportunities, which entails positive beliefs about future work goals and possibilities.

Five studies identified in our systematic review examined the relationship between SOC strategy use and work ability, which is defined as the mental or physical capability to meet work demands (Ilmarinen & Ilmarinen, 2015). However, two of these studies used the same sample. Müller et al. (2012; also Müller et al., 2013) found a positive relationships between SOC strategy use and self-reported work ability ($r = .24$), and Riedel et al. (2015) found positive associations of self-reported work ability with loss-based selection ($r = .05$), optimization ($r = .09$), and compensation ($r = .12$). In contrast, von Bonsdorff et al. (2014) and Weigl and colleagues (2013) reported nonsignificant relationships of SOC strategy use with self-reported and supervisor-reported work ability, respectively.

SOC strategy use as a mediator and moderator

In the systematic review, we further identified several studies that investigated SOC strategy use as a mediator or moderator of relationships between person and contextual antecedents and work outcomes. These results are not captured by our meta-analysis but are important for understanding the complex associations between SOC strategy use and its antecedents and outcomes. B. B. Baltes et al. (2011) investigated SOC strategy use as a mediator of relationships between personality characteristics and perceptions of work–family conflict. Findings showed that conscientiousness and agreeableness positively predicted SOC strategy use, which, in turn, led to decreased work–family conflict. Another study found that SOC strategy use mediated the positive relationship between perceived organizational justice and work ability when controlling for age (von Bonsdorff et al., 2014). Finally, a study revealed that positive associations between job resources, such as job control and development opportunities, and job engagement were mediated by SOC strategy use (Weigl et al., 2014).

Several studies suggest that particular person characteristics or certain job conditions are associated with favorable work outcomes only, or particularly, when SOC strategies are used. Five studies examined SOC strategy use as a moderator of relationships between person characteristics and work outcomes. First, Wiese and Heidemeier (2012) found that working mothers' self-efficacy better predicted work adjustment when SOC strategy use was high. Second, Müller et al. (2013) showed that older employees with poor physical health and low SOC strategy use had a lower intention to remain in bridge employment, whereas physical health was unrelated to the intention to remain among older employees with high SOC strategy use. Third, Demerouti et al. (2014) found that specific SOC components moderated the negative associations between burnout dimensions and supervisor-rated job performance. Specifically, compensation buffered the negative link between disengagement and performance, and selection exacerbated the negative

link between emotional exhaustion and adaptivity to change. Fourth, Venz and Sonnentag (2015) showed that overall SOC strategy use moderated the relationships between energy level in the morning and self-rated and co-worker-rated job engagement, such that SOC strategy use mitigated the effects of low energy level on job engagement. Finally, Shang et al. (2015) investigated SOC strategy use as a moderator of the relationship between perceived effort–reward imbalance and depressive symptoms. These authors found that employees with low SOC strategy use showed a stronger link between effort–reward imbalance and depressive symptoms than employees with high SOC strategy use.

One study investigated SOC strategy use as a moderator of associations between contextual characteristics and work outcomes. Specifically, Riedel et al. (2015) showed that SOC strategy use moderated the positive relationship between decision authority (i.e., job autonomy) and self-reported work ability, such that the relationship was stronger among employees with high SOC strategy use. In contrast, SOC strategy use did not buffer the negative effects of job demands on work ability.

Three studies investigated three-way interaction effects of SOC strategy use, person characteristics, and contextual characteristics on work outcomes. First, Yeung and Fung (2009) showed that, among older employees, SOC strategy use was associated with lower objective performance (i.e., sales volume) when task difficulty was high. In contrast, for young employees, SOC strategy use was associated with lower performance when task difficulty was low. Second, Zacher and Frese (2011) found that SOC strategy use helped older employees in low-complexity jobs to maintain a focus on opportunities at work, whereas SOC strategy use was less beneficial among young employees and employees in more complex jobs. Third, Weigl et al. (2013) examined SOC strategy use and job control as moderators of the relationship between age and work ability. They found that SOC strategy use buffered the negative link between age and supervisor-rated work ability, but only when job autonomy was high.

Longitudinal and experience sampling studies on SOC strategy use

Most studies examined between-person differences in SOC strategy use and measured it at only one point in time (Table 1). However, like other behaviors in the work context, SOC strategy use may vary and change within-persons over time. A number of studies identified in the systematic review investigated SOC strategy use at the within-person level by adopting longitudinal and experience sampling (or daily diary study) designs. These studies link change and variability in SOC strategy use with change and variability in antecedents and outcomes.

SOC antecedents
A three-wave longitudinal study by B. B. Baltes et al. (2014) investigated whether changes in employees' future time perspective (i.e., perceptions of remaining time) lead to changes in SOC strategy use among older employees working for a temporary employment agency. Unfortunately, the time lags were not reported in the study. SOC strategy use at Time 1 was moderately correlated with SOC strategy use at Time 2 ($r = .23$) and Time 3 ($r = .33$). Promotion focus positively predicted change in SOC strategy use over time ($\beta = .28$). Furthermore, promotion focus at Time 2 mediated the positive relationship between future time perspective at Time 1 and SOC strategy use at Time 3.

SOC outcomes
A two-wave panel study across 3 years by Wiese, Freund, and Baltes (2002) showed that SOC strategy use at Time 1 was moderately correlated with SOC strategy use at Time 2 with correlations ranging from $r = .42$ (selection) to $r = .58$ (optimization). Overall, SOC strategy use at Time 1 positively predicted job satisfaction at Time 2, but not self-reported job performance. A four-wave panel study by Wiese and Heidemeier (2012) investigated effects of SOC strategy use on employees' work adjustment after maternity leave. Data were collected 2 weeks before reentry, and 5 weeks, 11 weeks, and 6 months after returning to work. The stabilities of SOC strategy use over time were not reported. Results revealed that SOC strategy use increased with time passed after reentry. Moreover, engaging in SOC strategies predicted work adjustment of mothers after maternity leave over and above self-efficacy beliefs.

An experience sampling study across five work days by Yeung and Fung (2009) investigated relationships between daily SOC strategy use and daily subjective and objective task performance. Results showed that older employees' use of elective selection was positively associated with subjective task performance, especially when they worked on easy tasks. In contrast, young employees showed greater objective task performance (i.e., sales volume) when they used SOC strategies and worked on tasks with medium or high difficulty. The proportions of variance explained in SOC strategy use at the within- and between-person levels were not reported in this study. Another daily diary study conducted with administrative employees over five work days observed a positive within-person relationship between daily SOC strategy use and job satisfaction (Schmitt et al., 2012). While daily SOC strategy use was not significantly related to fatigue, it buffered the negative association between daily problem-solving demands and fatigue. This study also did not report proportions of variance explained in SOC strategy use at the within- and between-person levels.

More recently, Zacher et al. (2015) conducted a daily diary study across nine work days to investigate interactive effects of daily use of separate SOC strategies on daily job engagement. Results showed that moderate to large proportions of variance in SOC strategy use resided at the within-person level, with optimization showing the highest within-person variability (71 percent), followed by selection (45 percent) and compensation (43 percent). Daily optimization and compensation, but not selection, had positive main effects on daily job engagement. Moreover, a three-way interaction indicated that daily selection was only positively associated with daily engagement when both daily optimization and compensation were high. In contrast, selection was negatively associated with engagement when optimization was low and compensation was high. Finally, a daily diary study by Baethge et al. (2015) investigated associations among nurses' overall SOC strategy use (measured once in the baseline questionnaire), daily self-reported workload, and two self-reported job performance indicators across five workday shifts. The authors found that the negative relationship between daily workload and performance quality and the positive relationship between daily workload and "forgetting of intentions" were less pronounced among nurses with high (compared with low) SOC strategy use.

Discussion

We conducted the first systematic review and meta-analysis of the empirical literature on SOC strategy use in the work context. The meta-analytical results identified overall relationships between SOC strategy use and those antecedents and outcomes for which sufficient samples were available. The systematic review illustrated the breadth of constructs that have been studied in relation to SOC strategy use. It further showed that SOC strategy use can mediate or moderate associations between person and contextual characteristics and work outcomes, and highlighted variables that were associated with change and variation in SOC strategy use over time. In the following, we critically evaluate our findings and outline ideas for future research and practice.

Summary and evaluation of findings

SOC antecedents
With regard to antecedents of SOC strategy use, the SOC model assumes that high demands and limited resources trigger SOC strategy use (B. B. Baltes & Dickson, 2001; B. B. Baltes et al., 2012). As some personal resources, such as physical health, may become more limited with age, lifespan researchers assume that older adults use SOC strategies more often than young adults. In our meta-analysis, we found a positive and significant yet negligibly weak association between age and SOC strategy use, and thus, we could not support this assumption of the SOC model. Similarly, there was no significant association between job tenure and SOC strategy use. It is important to note, however, that our findings are based on cross-sectional research only, as no study has so far investigated the within-

person development of SOC strategy use across the working lifespan. Moreover, while the relationships of age and job tenure with SOC strategy use are likely to be moderated, no study has so far examined interactive effects of these time-related variables and other person or contextual characteristics on SOC strategy use.

We also did not find support for the assumptions that high job demands and low resources are positively related to SOC strategy use. In contrast, the meta-analysis showed that job demands are not significantly related to SOC strategy use, whereas job autonomy is positively related to SOC strategy use. Moreover, the systematic review yielded some evidence that task difficulty is negatively and employees' conscientiousness and self-efficacy are positively related to SOC strategy use. These findings qualify propositions of the SOC model in important ways. It is no longer viable to assume that high demands and low resources generally trigger SOC strategy use. Instead, certain internal and external resources, and especially job autonomy, appear to be necessary to allow the use of SOC strategies in the first place.

SOC outcomes

The evidence base for work-related outcomes of SOC strategy use is generally stronger than the one for antecedents of SOC strategy use. The meta-analysis showed that SOC strategy use is positively associated with both self-reported and non-self-reported job performance, job satisfaction, and job engagement. Contrary to predictions based on the SOC model, we did not find support for a negative relationship between SOC strategy use and job strain. However, several primary studies in our systematic review found interactive effects of age, personal resources, and SOC strategy use on work outcomes including occupational well-being, suggesting that older employees, and employees with low personal resources, may benefit more from SOC strategy use than young employees and employees with high personal resources (e.g., Demerouti et al., 2014; Venz & Sonnentag, 2015; Yeung & Fung, 2009; Zacher & Frese, 2011).

Possible moderators

Regarding our meta-analytic moderation analyses, most of the comparisons of published and unpublished studies yielded no significant differences in strengths of associations. Two exceptions were the relationships of SOC strategy use with job autonomy and job engagement, which were both stronger in unpublished than in published studies. The reasons for these unexpected differences remain unclear. However, overall, these findings suggest that the file drawer problem was unlikely present. We further did not find that restriction in age range, sample mean age, and standard deviation of age in the sample moderated the association between age and SOC strategy use. It is important to note, however, that the relatively small number of studies for the relationships investigated in our meta-analysis likely reduced the power to detect moderator effects of publication status and sample age distribution. Moreover, while the credibility interval and the Hunter and Schmidt (2004) criterion in many cases suggested that moderators are likely present, the available set of studies did not allow us to meta-analytically test for potentially important moderators other than publication status and age distribution.

Between-person differences and within-person change and variability in SOC strategy use

Most studies focused on between-person differences in SOC strategy use at work. However, in recent years, a number of studies using longitudinal and experience sampling designs demonstrated that SOC strategy use may change over longer time periods such as several months or years (B. B. Baltes et al., 2014; Wiese et al., 2002; Wiese & Heidemeier, 2012) and may fluctuate within-persons over time periods as short as one work week (e.g., Schmitt et al., 2012; Yeung & Fung, 2009; Zacher et al., 2015). These studies also showed that change and variability in SOC strategy use were associated with work outcomes such as job satisfaction, job engagement, job performance, and career success. This suggests that SOC strategy use may not only help employees achieve longer term goals but can also benefit them on a daily basis.

Suggestions for future research

Table 5 summarizes our suggestions for future research.

SOC antecedents

Given the rather limited evidence base for person antecedents of SOC strategy use, we recommend that organizational researchers place a greater focus on potential antecedents, as well as moderators of relationships between those antecedents and SOC strategy use, in the future. For instance, researchers could examine proactive and adaptable personality traits as antecedents of SOC strategy use at work. Proactive employees tend to actively influence their development and environment in positive ways (Bateman & Crant, 1993), and adaptable employees effectively adjust their goals to changing circumstances (Ployhart & Bliese, 2006). Thus, it seems likely that these individual differences predict SOC strategy use above and beyond the Big Five personality traits, self-related beliefs, and affective traits.

Regarding contextual antecedents, researchers could investigate the boundary conditions of relationships between job demands, job autonomy, and SOC strategy use. Moreover, they could examine broader contextual antecedents, such as cultural norms, team climate, and legal issues. Especially when it comes to selection strategy use in the work context, researchers should be aware that selection always requires autonomy to choose among different goals. This autonomy varies between teams, organizations, and cultures. For instance, employees working in individualistic cultures and autonomous teams may have more opportunities to use SOC strategies than employees working in collective cultures and traditional teams.

SOC outcomes

Research to date has assumed that SOC strategy use generally results in positive outcomes, such as higher performance and improved well-being, and neglected the possibility that SOC strategy use may be maladaptive in certain situations. For instance, when person and job resources are abundant, elective selection strategy use could lead to an unnecessary restriction of goals, which may be maladaptive in the long run. Similarly, in a situation in which a goal is no longer achievable, the most adaptive strategy would be loss-based selection rather than compensation. Furthermore, optimization strategy use, which entails the investment of resources such as attention and effort to achieve a goal, may be resource consuming in itself and eventually leads to the depletion of resources and feelings of fatigue. In contrast, compensation is a strategy that employees use when they have already experienced a resource loss, and it may help them to deal successfully with resource depletion and to overcome fatigue. Future research should further explore these possible reciprocal relationships between SOC strategy use and occupational well-being outcomes.

Future research should also continue to investigate outcomes of SOC strategy use other than task performance and occupational well-being. For instance, initial findings on positive relationships between some SOC strategies and subjective and objective career success are promising (Abele & Wiese, 2008). Moreover, researchers could examine associations between the use of SOC strategies and creative and innovative behavior in the work context (Rietzschel, Zacher, & Stroebe, in press). In this regard, the "deficits-breed-growth" hypothesis from the lifespan developmental literature (P. B. Baltes & Graf, 1996) suggests that individuals may use action regulation strategies to overcome personal constraints and limitations in creative ways.

SOC as mediator and moderator

So far, only few studies have examined SOC strategy use as a mediator or moderator of associations between person and contextual antecedents and work outcomes. Results showed that SOC can be triggered by certain person (e.g., conscientiousness) or contextual characteristics (e.g., job autonomy). Moreover, SOC strategy use may help employees deal more effectively with certain internal and external conditions (e.g., poor physical health and low job complexity). SOC strategy use, in turn, has been shown to result in positive work outcomes. Future research could further investigate such mediation and moderation effects, including person and job-related boundary conditions of relationships between SOC strategy use and work outcomes. For instance, we found only a very weak relationship

Table 5. Summary of future research suggestions on SOC.

Research focus	Specific research directions
	Conceptual questions
SOC antecedents	• Additional person antecedents, such as proactive and adaptable personality characteristics.
	• Boundary conditions of relationships between person characteristics, such as age and personality characteristics, and SOC strategy use.
	• Boundary conditions of relationships between job characteristics, such as job demands and autonomy, and SOC strategy use.
	• Broader contextual antecedents, such as cultural norms and legal issues.
SOC outcomes	• Differences in SOC strategy use between individualistic and collectivistic cultures.
	• Maladaptive use of SOC strategies in situations when resources are abundant or in situations when a goal is no longer achievable.
	• Boundary conditions of the effectiveness of each SOC component (e.g., can the use of each SOC component be adaptive or maladaptive in certain situations, or is there a strategy that is always adaptive?).
SOC as mediator and moderator	• SOC strategy use as a mediator or moderator of associations between person and contextual antecedents and work outcomes.
Interactions among the SOC components	• Interactions between the 4 SOC strategies in predicting work outcomes instead of investigating only overall and additive effects.
	• Effectiveness of simultaneous use of all SOC strategies as opposed to their sequential use over time (e.g., selection before optimization).
	Research design
Longitudinal and experience sampling studies	• Differences between trait and state forms of SOC strategy use.
	• Factors that predict (e.g., daily job demands and resources) and are predicted by (e.g., daily job performance) within-person changes and variability in SOC strategy use.
(Quasi-)experimental research and intervention designs	• Manipulate SOC strategy use of employees using (quasi-)experimental research designs and randomized controlled intervention designs.
	• Boundary conditions (e.g., individual and work characteristics) of SOC training effects.
Different levels of SOC strategy use	• SOC strategy use of leaders, as well as in teams and organizations.
	• Interplay between different levels of SOC strategy use (e.g., the impact of leaders' SOC strategy use on SOC strategy use at the team level).
	Measurement and reporting
SOC questionnaire	• Comparison of the different versions of the SOC questionnaire (i.e., 49, 12, or 9 items; dichotomous vs. continuous response formats).
	• Validation of job-specific adaptations of the SOC questionnaire.
Objective SOC measures	• Observer ratings, for instance by co-workers and supervisors.
	• Expert ratings of videos.
	• Development of situational judgment tests.
Distinct components and higher order construct	• Reporting of all 4 SOC component scores, an overall SOC strategy use score, and their correlations with antecedent and outcome variables.

Note: SOC = selection, optimization, compensation.

between age and SOC strategy use in our meta-analysis. However, our systematic review suggested that the combination of age with other person and job characteristics may influence the strength of relationships between SOC strategy use and important work outcomes.

Interactions among the SOC components

The SOC theory assumes that the synchronized or coordinated use of SOC strategies leads to effective functioning and well-being (Freund & Baltes, 2000). Most organizational researchers have operationalized this assumption by computing an overall SOC score. In contrast, the possibility that SOC components interact in predicting outcomes has so far been largely neglected. An exception is the study by Zacher et al. (2015), which found that SOC strategies mutually enhance each other's effects on daily job engagement. More research adopting such an interactive perspective is desirable. Another possible way to operationalize the notion of "orchestration" may be to measure SOC strategy use sequentially over time. All studies included in our systematic review focused on the simultaneous use of all SOC strategies, including the longitudinal studies. For instance, future research could examine whether employees who first engage in selection and, subsequently, in optimization and compensation are most effective.

Research designs

SOC strategy use, like other forms of work behavior, differs not only between individuals but also within individuals over time. While stable individual difference characteristics, such as personality traits, may predispose some employees to make greater use of SOC strategies than others, more dynamic person and contextual characteristics, such as daily experiences and work events, could explain why an employee's SOC strategy use varies over time (cf. Weiss & Cropanzano, 1996). Longitudinal and experience sampling designs should be used in the future to further disentangle stable trait and dynamic state components of SOC strategy use. Moreover, these designs can be used to examine factors that predict (e.g., dynamic self-related beliefs, affective experiences, job demands, and resources) and are predicted (e.g., job satisfaction and performance) by within-person changes and variability in SOC strategy use. Our systematic review showed that only one study has so far investigated changes in SOC antecedents and their effects on change in SOC strategy use over time (B. B. Baltes et al., 2014). In addition to these dynamic designs, future research could employ (quasi-)experimental research designs in the actual work context that may provide reliable guidelines for practical interventions in the workplace.

All studies on the SOC model at work have so far exclusively focused on the individual employee level. However, B. B. Baltes and Dickson (2001) argued that not only individuals but also leaders, teams, and organizations may benefit from the use of SOC strategies. We recommend that future studies consider not only additional conceptual and analytical levels of SOC strategy use but also the antecedents and outcomes of SOC strategy use on multiple levels. For instance, it may be interesting to explore how team and organizational level outcomes are affected by (diversity of) SOC strategy use at the individual level.

Measurement of SOC strategy use

A first concern about current research on SOC at work is the use of different versions of the same self-report measure (P. B. Baltes et al., 1999; Freund & Baltes, 2002). In addition to typical problems of self-report instruments (e.g., self-enhancement bias and common method bias), it is unclear how the different versions (i.e., 49, 12, or 9 items; dichotomous vs. continuous response formats) are related and how adaptations affect construct validity. Hence, we recommend that research comparing the different questionnaires is conducted, including job-specific adaptations of the SOC questionnaire (cf. Müller et al., 2012). Second, we did not identify a single study that used other-source ratings of employees' SOC strategy use such as co-worker, supervisor, or expert ratings. Future research should obtain ratings of employees' SOC strategy use from multiple sources to validate self-report measures.

Third, future research could employ more sophisticated ways to operationalize SOC strategy use. A number of examples in this regard exist in the lifespan literature. For instance, Lang, Rieckmann, and Baltes (2002) conducted interviews to assess older adults' daily activities, their duration, and with whom they were carried out. The responses were subsequently content-analyzed and coded to operationalize SOC strategy use in daily life (also Gignac, Cott, &

Badley, 2002, for a similar approach). In addition, situational judgment tests (Campion, Ployhart, & MacKenzie, 2014) could be used to capture employees' responses to realistic vignettes of work situations. Future research could also test whether more specific and situational measures show better predictive validity compared with more general SOC measures.

Reporting of SOC results

Another important issue concerns the way findings on SOC strategy use are reported. Many researchers exclusively report associations with the overall SOC score, and—typically with reference to the notion of "orchestration" of strategies (Freund & Baltes, 2000)—do not report associations for the four SOC components. However, this approach neglects that the strategies, albeit positively related, are conceptually distinct components of a higher order construct. Indeed, there may be work situations in which one of the strategies is adaptive while others may be maladaptive. Moreover, research suggests that the SOC components mutually enhance each other's effects on work outcomes (Zacher et al., 2015). Our systematic review also showed that many studies reported only three components (selection, optimization, compensation) rather than four, assuming that elective and loss-based selection are closely related indicators of the same strategy. However, the SOC model differentiates between these components because loss-based selection results from a loss in resources that requires the re-organization of goals, while elective selection involves the voluntary selection of goals (P. B. Baltes, 1997; Freund & Baltes, 2000). In sum, we recommend that researchers report all four SOC component scores, an overall score, and their correlations with antecedents and outcomes.

Practical implications

Our meta-analytic findings showed robust positive relationships between SOC strategy use and three important work outcomes: job performance, job satisfaction, and job engagement. This suggests that organizations may benefit from selecting employees based on their SOC strategy use and from training them in SOC strategy use (for further interventions in this area, see Truxillo et al., 2015). For instance, practitioners could use the reliable 49-item version of the SOC questionnaire (P. B. Baltes et al., 1999) to select future employees. Employees could also be trained to better select and prioritize their work goals, optimize goal pursuit, and compensate for the loss of goal-relevant resources (cf. Müller et al., 2012). A SOC training could cover both theoretical and practical issues related to SOC strategy use to increase employees' awareness of its benefits and to provide them with a knowledge base and practice opportunities for the use of the strategies in their daily work (Zacher & Frese, 2011). Use of selection could be facilitated by the use of to-do lists and goal setting exercises. Training optimization strategy use could involve positive role models and discussion about how employees can optimally allocate their resources. As for compensation strategies, trainers could make employees aware of different possibilities to compensate for decreases in personal resources, such as age-related losses in physical abilities.

A recently published randomized controlled intervention study, which did not measure but manipulate SOC strategy use in the work context, showed that SOC training improved the mental well-being of nurses working in a community hospital, particularly among those nurses who indicated a strong commitment to the intervention (Müller et al., 2015). The training involved six sessions (total of 16.5 hours) over 9 months, in which small groups of six to eight nurses learned about the propositions of the SOC model and, based on the model, carried out a personal project to deal more effectively with one important job demand or to activate an important job resource of their choice. The study by Müller et al. (2015) is the first to suggest that SOC training may help improve the well-being of employees working in highly demanding jobs. However, with regard to this issue, organizations should also be prepared to manage possible consequences of increased SOC strategy use among their employees. For instance, when employees decide to prioritize certain goals over others, their supervisor or co-workers may have to compensate for this shift in goal priorities and effort allocation.

Conclusion

In this article, we utilized the unique strengths of two approaches to literature reviews. First, our meta-analysis of the organizational literature on the SOC model showed that SOC strategy use is positively associated with job performance, job satisfaction, job engagement, and job autonomy, whereas we found no significant or negligibly weak relationships of SOC strategy use with age, job tenure, job demands, and job strain. Thus, our findings suggest that organizations may benefit from personnel selection, training, and work design approaches that focus on employees' SOC strategy use. Second, our systematic review highlighted a number of associations between SOC strategy use and additional constructs in the work context that were not captured by the meta-analysis. Moreover, it showed that SOC strategy use may mediate and moderate associations of person and contextual characteristics with work outcomes, and that SOC strategy use may change and vary within persons over time. We recommend that future studies (i) use reliable and well-validated instruments and multiple sources to measure SOC strategy use at work; (ii) employ more sophisticated research designs including longitudinal, experience sampling, and (quasi-)experimental studies; (iii) investigate SOC strategy use not only at the individual but also the leader, team, and organizational levels; and (iv) report effects for overall SOC strategy use, separate SOC components, and their interactive effects on work outcomes. Overall, findings of our systematic review and meta-analysis suggest that the SOC model is a fruitful theory of action regulation in the work context, and that the use of SOC strategies has positive implications for individual employees and organizations.

Author biographies

Darya Moghimi is a PhD student of organizational psychology at the University of Groningen and at the Kurt Lewin Institute in the Netherlands. Her research focuses on aging at work, the selection, optimization, and compensation model, job crafting, and person–environment fit.
Hannes Zacher is Professor of Innovation and Human Resource Management at Queensland University of Technology in Australia. His research focuses on aging at work, career development, innovation, entrepreneurship, and pro-environmental employee behavior.
Susanne Scheibe is Associate Professor of Organizational Psychology at the University of Groningen in the Netherlands. Her research focuses on topics related to work and aging, with a particular focus on affect and emotion regulation.
Nico W. Van Yperen is Professor of Organizational Psychology at the University of Groningen in the Netherlands. His research interests include achievement motivation, work stress, talent development, self-regulation, and blended working.

References

Abele, A. E., & Wiese, B. S. (2008). The nomological network of self-management strategies and career success. *Journal of Occupational and Organizational Psychology*, *81*, 733–749. doi:10.1348/096317907X256726.

Abraham, J. D., & Hansson, R. O. (1995). Successful aging at work: An applied study of selection, organization, optimization, and compensation through impression management. *The Journals of Gerontology: Psychological Sciences and Social Sciences*, *50B*, 94–103. doi:10.1093/geronb/50B.2.P94.

Baethge, A., Müller, A., & Rigotti, T. (2015). Nursing performance under high workload: A diary study on the moderating role of selection, optimization and compensation strategies. *Journal of Advanced Nursing*. doi:10.1111/jan.12847.

Bajor, J. K., & Baltes, B. B. (2003). The relationship between selection optimization with compensation, conscientiousness, motivation, and performance. *Journal of Vocational Behavior*, *63*, 347–367. doi:10.1016/S0001-8791(02)00035-0.

Bal, P. M., & De Lange, A. H. (2015). From flexibility human resource management to employee engagement and perceived job performance across the lifespan: A multisample study. *Journal of Occupational and Organizational Psychology*, *88*, 126–154. doi:10.1111/joop.12082.

Bal, P. M., Kooij, D. T. A. M., & De Jong, S. B. (2013). How do developmental and accommodative HRM enhance employee engagement and commitment? The role of psychological contract and SOC strategies. *Journal of Management Studies*, *50*, 545–572. doi:10.1111/joms.12028.

Baltes, B. B., & Dickson, M. W. (2001). Using life-span models in industrial-organizational psychology: The theory of selective optimization with compensation. *Applied Developmental Science*, *5*, 51–62. doi:10.1207/S1532480XADS0501_5.

Baltes, B. B., & Heydens-Gahir, H. A. (2003). Reduction of work–family conflict through the use of selection, optimization, and compensation behaviors. *Journal of Applied Psychology*, *88*, 1005–1018. doi:10.1037/0021-9010.88.6.1005.

Baltes, B. B., & Rudolph, C. W. (2013). The theory of selection, optimization, and compensation. In M. Wang (Ed.), *The Oxford handbook of retirement* (pp. 88–101). New York: Oxford University Press.

Baltes, B. B., Rudolph, C. W., & Bal, A. C. (2012). A review of aging theories and modern work perspectives. In J. W. Hedge, & W. C. Borman (Eds.), *The Oxford handbook of work and aging* (pp. 117–136). New York: Oxford University Press.

Baltes, B. B., Wynne, K., Sirabian, M., Krenn, D., & Lange, A. (2014). Future time perspective, regulatory focus, and selection, optimization, and compensation: Testing a longitudinal model. *Journal of Organizational Behavior*, *35*, 1120–1133. doi:10.1002/job.1970.

Baltes, B. B., Zhdanova, L. S., & Clark, M. A. (2011). Examining the relationships between personality, coping strategies, and work–family conflict. *Journal of Business and Psychology*, *26*, 517–530. doi:10.1007/s10869-010-9207-0.

Baltes, P. B. (1997). On the incomplete architecture of human ontogeny: Selection, optimization, and compensation as foundation of developmental theory. *American Psychologist*, *52*, 366–380. doi:10.1037/0003-066X.52.4.366.

Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. In P. B. Baltes, & M. M. Baltes (Eds.), *Successful aging: Perspectives from the behavioral sciences* (Vol. *1*, pp. 1–34). New York: Cambridge University Press.

Baltes, P. B., Baltes, M. M., Freund, A., & Lang, F. (1999). *The measurement of selection, optimization, and compensation (SOC) by self report: Technical report*. Berlin, Germany: Max Planck Institute for Human Development.

Baltes, P. B., & Graf, P. (1996). Psychological aspects of aging: Facts and frontiers. In D. Magnusson (Ed.), *The lifespan development of individuals: Behavioral, neurobiological, and psychosocial perspectives* (pp. 427–459). New York: Cambridge University Press.

Bateman, T. S., & Crant, J. M. (1993). The proactive component of organizational behavior: A measure and correlates. *Journal of Organizational Behavior*, *14*, 103–118. doi:10.1002/job.4030140202.

Campion, M. C., Ployhart, R. E., & MacKenzie, W. I. Jr. (2014). The state of research on situational judgment tests: A content analysis and directions for future research. *Human Performance*, *27*, 283–310. doi:10.1080/08959285.2014.929693.

Demerouti, E., Bakker, A. B., & Leiter, M. (2014). Burnout and job performance: The moderating role of selection, optimization, and compensation strategies. *Journal of Occupational Health Psychology*, *19*, 96–107. doi:10.1037/a0035062.

Freund, A. M., & Baltes, P. B. (2000). The orchestration of selection, optimization and compensation: An action-theoretical conceptualization of a theory of developmental regulation. In W. J. Perrig, & A. Grob (Eds.), *Control of human behavior, mental processes, and consciousness* (pp. 35–58). Mahwah, NJ: Lawrence Erlbaum.

Freund, A. M., & Baltes, P. B. (2002). Life-management strategies of selection, optimization and compensation: Measurement by self-report and construct validity. *Journal of Personality and Social Psychology*, *82*, 642–662. doi:10.1037/0022-3514.82.4.642.

Geyskens, I., Krishnan, R., Steenkamp, J.-B. E., & Cunha, P. V. (2009). A review and evaluation of meta-analysis practices in management research. *Journal of Management*, *35*, 393–419. doi:10.1177/0149206308328501.

Gignac, M. A., Cott, C., & Badley, E. M. (2002). Adaptation to disability: Applying selective optimization with compensation to the behaviors of older adults with osteoarthritis. *Psychology and Aging*, *17*, 520–524. doi:10.1037/0882-7974.17.3.520.

Hertel, G., Thielgen, M., Rauschenbach, C., Grube, A., Stamov-Roßnagel, C., & Krumm, S. (2013). Age differences in motivation and stress at work. In C. Schlick, E. Frieling, & J. Wegge (Eds.), *Age-differentiated work systems* (pp. 119–147). Berlin, Germany: Springer.

Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis: Correcting error and bias in research findings*. Newbury Park, CA: Sage.

Ilmarinen, J., & Ilmarinen, V. (2015). Work ability and aging. In L. M. Finkelstein, D. M. Truxillo, F. Fraccaroli, & R. Kanfer (Eds.), *Facing the challenges of a multi-age workforce: A use-inspired approach* (pp. 134–156). New York: Routledge.

Kooij, D., & Van De Voorde, K. (2011). How changes in subjective general health predict future time perspective, and development and generativity motives over the lifespan. *Journal of Occupational and Organizational Psychology*, *84*, 228–247. doi:10.1111/j.2044-8325.2010.02012.x.

Lang, F. R., Rieckmann, N., & Baltes, M. M. (2002). Adapting to aging losses: Do resources facilitate strategies of selection, compensation, and optimization in everyday functioning? *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *57*, 501–509. doi:10.1093/geronb/57.6.P501.

Müller, A., De Lange, A., Weigl, M., Oxfart, C., & Van der Heijden, B. (2013). Compensating losses in bridge employment? Examining relations between compensation strategies, health problems, and intention to remain at work. *Journal of Vocational Behavior*, *83*, 68–77. doi:10.1016/j.jvb.2013.03.002.

Müller, A., Heiden, B., Herbig, B., Poppe, F., & Angerer, P. (2015). Improving well-being at work: A randomized controlled intervention based on selection, optimization, and compensation. *Journal of Occupational Health Psychology*. doi:10.1037/a0039676.

Müller, A., & Weigl, M. (2015). Selection, optimization, and compensation at work in relation to age. In N. A. Pachana (Ed.), *Encyclopedia of geropsychology*. New York: Springer.

Müller, A., Weigl, M., Heiden, B., Glaser, J., & Angerer, P. (2012). Promoting work ability and well-being in hospital nursing: The interplay of age, job control, and successful ageing strategies. *Work: A Journal of Prevention, Assessment and Rehabilitation*, *41*, 5137–5144. doi:10.3233/WOR-2012-0083-5137.

Müller, A., Weigl, M., Heiden, B., Herbig, B., Glaser, J., & Angerer, P. (2013). Selection, optimization, and compensation in nursing: Exploration of job-specific strategies, scale development, and age-specific associations to work ability. *Journal of Advanced Nursing*, *69*, 1630–1642. doi:10.1111/jan.12026.

Philipp, A., & Kunter, M. (2013). How do teachers spend their time? A study on teachers' strategies of selection, optimisation, and compensation over their career cycle. *Teaching and Teacher Education*, *35*, 1–12. doi:10.1016/j.tate.2013.04.014.

Ployhart, R. E., & Bliese, P. D. (2006). Individual adaptability (I-ADAPT) theory: Conceptualizing the antecedents, consequences, and measurement of individual differences in adaptability. In C. S. Burke, L. G. Pierce, & E. Salas (Eds.), *Understanding adaptability: A prerequisite for effective performance within complex environments* (pp. 3–40). Amsterdam, the Netherlands: Elsevier.

Riedel, N., Müller, A., & Ebener, M. (2015). Applying strategies of selection, optimization, and compensation to maintain work ability: A psychosocial resource complementing the job demand–control model? *Journal of Occupational and Environmental Medicine*, *57*, 552–561. doi:10.1097/JOM.0000000000000402.

Rietzschel, E. F., Zacher, H., & Stroebe, W. (in press). A lifespan perspective on creativity and innovation at work. *Work, Aging and Retirement*. doi:10.1093/worker/waw005.

Rosenthal, R. (1979). The file drawer problem and tolerance for null results. *Psychological Bulletin*, *86*, 638–641. doi:10.1037/0033-2909.86.3.638.

Schmitt, A., Zacher, H., & Frese, M. (2012). The buffering effect of selection, optimization, and compensation strategy use on the relationship between problem solving demands and occupational well-being: A daily diary study. *Journal of Occupational Health Psychology*, *17*, 139–149. doi:10.1037/a0027054.

Shang, L., Riedel, N., Loerbroks, A., Müller, A., Wege, N., Angerer, P., et al. (2015). The association between effort–reward imbalance and depressive symptoms is modified by selection, optimization, and compensation strategy. *Journal of Occupational and Environmental Medicine*, *57*, 1222–1227. doi:10.1097/JOM.0000000000000546.

Steele, P. D., & Kammeyer-Mueller, J. D. (2002). Comparing meta-analytic moderator estimation techniques under realistic conditions. *Journal of Applied Psychology*, *87*, 96–111. doi:10.1037/0021-9010.87.1.96.

Truxillo, D. M., Cadiz, D. M., & Hammer, L. B. (2015). Supporting the aging workforce: A review and recommendations for workplace intervention research. *Annual Review of Organizational Psychology and Organizational Behavior*, *2*, 351–381. doi:10.1146/annurev-orgpsych-032414-111435.

Truxillo, D. M., Cadiz, D. M., Rineer, J. R., Zaniboni, S., & Fraccaroli, F. (2012). A lifespan perspective on job design: Fitting the job and the worker to promote job satisfaction, engagement, and performance. *Organizational Psychology Review*, *2*, 340–360. doi:10.1177/2041386612454043.

Tschopp, C., Grote, G., & Köppel, N. (2015). Disentangling effects of age and career preferences on the relationship between job satisfaction and turnover intention and behavior: An examination in three samples. *Work, Aging and Retirement*. doi:10.1093/workar/wav022.

Unger, D., Sonnentag, S., Niessen, C., & Kuonath, A. (2015). The longer your work hours, the worse your relationship? The role of selective optimization with compensation in the associations of working time with relationship satisfaction and self-disclosure in dual-career couples. *Human Relations*, *68*, 1889–1912. doi:10.1177/0018726715571188.

Unson, C., & Richardson, M. (2013). Insights into the experiences of older workers and change: Through the lens of selection, optimization, and compensation. *The Gerontologist*, *53*, 484–494. doi:10.1093/geronb/57.5.P426.

Venz, L., & Sonnentag, S. (2015). Being engaged when resources are low: A multi-source study of selective optimization with compensation at work. *Journal of Vocational Behavior*, *91*, 97–105. doi:10.1016/j.jvb.2015.09.008.

von Bonsdorff, M. E., von Bonsdorff, M. B., Zhou, Z. E., Kauppinen, M., Miettinen, M., Rantanen, T., et al. (2014). Organizational justice, selection, optimization with compensation, and nurses' work ability. *Journal of Occupational and Environmental Medicine*, *56*, 326–330. doi:10.1097/JOM.0000000000000102.

Weigl, M., Müller, A., Hornung, S., Leidenberger, M., & Heiden, B. (2014). Job resources and work engagement: The contributing role of selection, optimization, and compensation strategies at work. *Journal for Labour Market Research*, *47*, 299–312. doi:10.1007/s12651-014-0163-4.

Weigl, M., Müller, A., Hornung, S., Zacher, H., & Angerer, P. (2013). The moderating effects of job control and selection, optimization, and compensation strategies on the age-work ability relationship. *Journal of Organizational Behavior*, *34*, 607–628. doi:10.1002/job.1810.

Weiss, H. M., & Cropanzano, R. (1996). Affective events theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work. In B. M. Staw, & L. L. Cummings (Eds.), *Research in organizational behavior* (pp. 1–74). Greenwich, CT: JAI Press.

Wiese, B. S., Freund, A. M., & Baltes, P. B. (2000). Selection, optimization, and compensation: An action-related approach to work and partnership. *Journal of Vocational Behavior*, *57*, 273–300. doi:10.1006/jvbe.2000.1752.

Wiese, B. S., Freund, A. M., & Baltes, P. B. (2002). Subjective career success and emotional well-being: Longitudinal predictive power of selection, optimization and compensation. *Journal of Vocational Behavior*, *60*, 321–335. doi:10.1006/jvbe.2001.1835.

Wiese, B. S., & Heidemeier, H. (2012). Successful return to work after maternity leave: Self-regulatory and contextual influences. *Research in Human Development*, *9*, 317–336. doi:10.1080/15427609.2012.729913.

Yeung, D. Y., & Fung, H. H. (2009). Aging and work: How do SOC strategies contribute to job performance across adulthood? *Psychology and Aging*, *24*, 927–940. doi:10.1037/a0017531.

Young, L. M., Baltes, B. B., & Pratt, A. K. (2007). Using selection, optimization, and compensation to reduce job/family stressors: Effective when it matters. *Journal of Business and Psychology*, *21*, 511–539. doi:10.1007/s10869-007-9039-8.

Zacher, H. (2015). Successful aging at work. *Work, Aging and Retirement*, *1*, 4–25. doi:10.1093/workar/wau006.

Zacher, H., Chan, F., Bakker, A. B., & Demerouti, E. (2015). Selection, optimization, and compensation strategies: Interactive effects on daily work engagement. *Journal of Vocational Behavior*, *87*, 101–107. doi:10.1016/j.jvb.2014.12.008.

Zacher, H., & Frese, M. (2011). Maintaining a focus on opportunities at work: The interplay between age, job complexity, and the use of selection, optimization, and compensation strategies. *Journal of Organizational Behavior*, *32*, 291–318. doi:10.1002/job.683.

Zacher, H., & Frese, M. (in press). Action regulation theory: Foundations, current knowledge, and future directions. In N. Anderson, D. S. Ones, C. Viswesvaran, & H. K. Sinangil (Eds.), *Handbook of industrial, work, & organizational psychology* (Vol. *2*). London: Sage.

Zaniboni, S., Truxillo, D. M., & Fraccaroli, F. (2013). Differential effects of task variety and skill variety on burnout and turnover intentions for older and younger workers. *European Journal of Work and Organizational Psychology*, *22*, 306–317. doi:10.1080/1359432X.2013.782288.

Zaniboni, S., Truxillo, D. M., Fraccaroli, F., McCune, E. A., & Bertolino, M. (2014). Who benefits from more tasks? Older versus younger workers. *Journal of Managerial Psychology*, *29*, 508–523. doi:10.1108/JMP-12-2012-0381.