

## ARTICLE

# The multidimensional nature of career self-management behaviours and their relation to facets of employability

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## Abstract

Career self-management (CSM) has attracted increased scholarly interest, but definitional issues and the lack of an integrative understanding constrain research on the topic. In two studies, we seek to clarify the nature and dimensionality of CSM behaviour, examine the relation of specific dimensions to the general construct and investigate the relation of different CSM behaviours to facets of employability. In Study 1, we used a systematic literature review and thematic analysis to identify seven key CSM behaviours: (a) impression management, (b) building contacts, (c) using contacts, (d) human capital development, (e) goal setting and planning, (f) self-exploration and (g) mobility-oriented behaviour. Across two samples in Study 2 (combined  $N = 1065$ ), we examined the relation of the seven behaviours to the general CSM construct and their relation to facets of employability in a time-lagged analysis. The results show that CSM behaviours are best modelled as a bifactor structure with a general dimension and seven specific behaviours. Specific CSM behaviours explained unique variance in specific facets of employability. In sum, the studies clarify our understanding of CSM's nature, dimensionality, structure, and nomological net.

## KEYWORDS

career management, career proactivity, employability, proactive career behaviour

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### Practitioner points

- We identify seven key behaviours of career self-management (CSM). Our results indicate that engaging in career self-management is important to build and maintain employability. Specific behaviours are more important than others for certain types of employability.
- To encourage employees to direct their careers and manage their career-related resources, practitioners should support a general engagement in career behaviours as well as specific behaviours.
- Organizations should jointly consider employee CSM behaviours, their employability resources, and career track requirements to adapt talent management to individual and organizational needs.

## BACKGROUND

In a world characterized by fast-changing skill requirements and dynamic labour markets (Frey & Osborne, 2017), individuals must proactively direct their careers to maintain their employability and attain objective and subjective career success. Career self-management (CSM), the process through which persons regulate their career actions, including the development, pursuit, and adaptation of career goals (Greenhaus et al., 2019) has received growing scholarly attention (Brown & Lent, 2019). The career counselling literature likewise emphasizes the need for continuous, lifelong engagement in CSM in which individuals regularly adapt and revise their career goals and actions (Lent, 2013).

Scholars agree that cognitive-behavioural processes are at the centre of CSM. For instance, King (2004) characterizes CSM as a process which includes multiple jointly occurring CSM behaviours. Accordingly, research on CSM has studied a diverse array of CSM behaviours, such as skill development (Heslin et al., 2019), networking (Forret & Dougherty, 2004), or career exploration (Jiang et al., 2019) that have been linked to multiple positive outcomes, including career success (Seibert et al., 2001) and increased employability (Porter et al., 2016).

However, despite its growing importance, the literature lacks consensus on how CSM should be conceptualized, what the central behaviours of CSM are, and how the specific behaviours relate to the overarching CSM construct. In the absence of a clearer conceptualization of CSM and an integrative framework of CSM behaviours, existing research suffers from at least four related issues. First, multiple definitions of CSM exist in the literature. While these generally overlap (e.g., Jiang et al., 2023; Klehe et al., 2021), they do not clearly define the core attributes of CSM or delineate the CSM construct from related constructs within the vocational behaviour and proactivity literature. As we will show, this lack of conceptual clarity resulted in issues of construct deficiency or contamination in the study of CSM behaviours.

Second, it remains unknown what the key CSM behaviours are, leading research to often rely on an unsystematic selection of CSM behaviours in existing studies. Existing theoretical models and reviews point out that an often eclectic variety of behaviours have been studied but offer conflicting views on which are central to the CSM construct (Hirschi & Koen, 2021; Jiang et al., 2023; King, 2004). Likewise, prior measures of CSM behaviour differ widely in the behaviours they measure (e.g., Gould & Penley, 1984; Strauss et al., 2012). In the absence of a common understanding of the key behaviours of CSM, research on CSM remains fragmented.

Third, it remains unclear how individual CSM behaviours relate to the overarching CSM construct. Most studies examine different CSM behaviours as correlated dimensions of a multidimensional construct without specifying a general level (e.g., Sturges et al., 2002). Others have argued that CSM behaviour can be represented as a higher-order construct of which the specific behaviours are merely indicators of secondary interest (e.g., Strauss et al., 2012). Other studies focused only on the general

level of CSM behaviour and treated it as a first-order unidimensional construct (e.g., Seibert et al., 2001). Specifying the relation of individual dimensions to the general construct is an important aspect of construct conceptualization (MacKenzie et al., 2011) not only because of its implications for the nature of the construct but also because of its implications for the construct's nomological net (i.e., its antecedents and outcomes).

Fourth, we lack a coherent perspective on how the various CSM behaviours relate to outcomes such as employability. Employability denotes individual's career potential in labour markets (e.g., Forrier & Sels, 2003; van Harten et al., 2022). From a resource management perspective, CSM builds, maintains, and uses various facets of employability (such as social or human capital), representing resources for employment and career success (Forrier et al., 2015; Spurk et al., 2019). While various facets of employability have been studied as outcomes of CSM, it remains unclear which CSM behaviours are uniquely related to specific facets of employability.

In sum, we lack a more integrative perspective on the different types of CSM behaviours that people use to shape their careers, how these behaviours are related to one another or an overarching construct, and the unique and common outcomes of various CSM behaviours. These issues are important because the lack of an integrative understanding of CSM limits insights into the specific ways people shape their careers through CSM and how CSM behaviours are related to important career outcomes, such as employability. For instance, if CSM behaviour consists of a general dimension and multiple specific dimensions, it would call into question research that attributes specific outcomes (e.g., increased social capital) to the effects of specific CSM behaviours (e.g., networking) when other behaviours have been omitted (e.g., career planning). Such omissions would bias the relation of specific CSM behaviours to correlates (i.e., omitted variable bias), thereby obscuring our understanding of the true effects of CSM.

To address these issues, the aims of this paper are fourfold: The first aim is to provide a clear conceptualization of CSM in terms of its core attributes by reviewing and integrating existing definitions of CSM. This revised conceptualization of CSM and CSM behaviour builds the basis for the further aims of the study. The second aim is to identify the key CSM behaviours and synthesize them into an integrative framework through a systematic literature review. Because our literature review indicates that no prior measure fully captures the integrative framework, we also develop a new measure of CSM behaviour to measure each key behaviour concisely. The third aim is to empirically identify the relation of these key CSM behaviours to the general construct level, to further clarify the conceptual and empirical nature of CSM. The fourth aim is to examine whether specific CSM behaviours are uniquely related to specific employability outcomes, to illuminate specific and general effects of CSM.

In following these aims, the present article makes several contributions to the existing literature. First, the conceptual clarification of CSM provides the literature with a deeper understanding of the core attributes of CSM. Importantly, a clear concept definition avoids issues of construct contamination by delineating CSM from related constructs. Second, identifying key CSM behaviours based on a systematic analysis of the literature integrates the various studied CSM behaviours into a unifying framework that addresses shortcomings of prior frameworks, such as omitting important behaviours. Furthermore, the key behaviours are relevant across the lifespan and applicable to different age groups and different transitions across the lifespan (e.g., school-to-work, mid-career transitions) and hence facilitate the integration of research of CSM across these groups and transitions. Third, developing and validating a new measure to comprehensively assess these key behaviours should facilitate future research into CSM behaviour. Fourth, we resolve outstanding conceptual and measurement issues in how the various CSM behaviours are related to the general construct level. Whereas previous studies have considered individual CSM behaviours in isolation, studied multiple behaviours separately, or aggregated them into a single factor, we expand these conceptions by showing that a bifactor model with specific and general dimensions is more conceptually sound and psychometrically valid. Fifth, we advance the current understanding of the nomological net of CSM by showing how specific CSM behaviours are uniquely linked to specific facets of employability. These findings extend theories of career capitals or resources (e.g., Arthur et al., 1995; Forrier et al., 2015) as they clarify the links between CSM behaviours and specific forms of career capital.

The remainder of the article is structured as follows: First, we provide a conceptual clarification of CSM and its core attributes. Second, in Study 1, we identify key CSM behaviours through a thematic analysis based on a systematic literature review. Third, in Study 2, we confirm the identified key behaviours empirically by developing and validating a new measure. We examine the higher-order structure of CSM behaviour in terms of the relation of specific CSM behaviours to the general CSM construct across two independent samples, and test hypotheses how CSM behaviours are linked to multiple facets of employability in a time-lagged analysis. Finally, we discuss the implications of our studies for career research, theory, and counselling practice.

## Clarifying the conceptualization of CSM

To conceptually clarify CSM, we followed best-practice recommendations of concept development (Podsakoff et al., 2016). First, we compiled a representative set of definitions and conceptualizations of CSM from previous research. Different authors refer to the CSM construct by different names, often as career proactivity (Jiang et al., 2023; Klehe et al., 2021; Strauss et al., 2012), but also proactive career behaviour (e.g., Claes & Ruiz-Quintanilla, 1998; De Vos et al., 2009). These refer to essentially the same construct, and we treat them synonymously. Second, we synthesize the definitions found in the literature to define the core attributes of CSM and CSM behaviour. Finally, we propose an integrative definition of the CSM and CSM behaviour concepts.

### Existing definitions of CSM

An influential definition was developed by Greenhaus et al. (2019), who define CSM as the “process by which individuals develop, implement, and monitor career goals and strategies” (p. 12). Kossek et al. (1998) define CSM as the “degree to which one regularly gathers information and plans for career problem solving and decision making” (p. 938). King (2004) defines CSM as a “dynamic process, involving execution of a set of co-occurring behaviors (...) intended to prevail upon the decisions made by those gatekeepers who are in a position to influence (...) desired career outcomes” (p. 119). Referring to proactive career behaviour, De Vos et al. (2009) define CSM as “the deliberate actions undertaken by individuals in order to realize their career goals” (p. 763). A recent review defines CSM as “individual's self-initiated and future-oriented actions aiming to influence, change, and improve career circumstances including the situation and the self” (Jiang et al., 2023, p. 146).

### Core attributes and integrative definition of CSM

Examining these definitions suggests several core attributes of CSM that delineate it from other constructs. CSM is, like related proactivity constructs, (a) *self-initiated* (Jiang et al., 2023). It differs from other-initiated constructs, such as training activities assigned by HRM or employment offices. Moreover, CSM is (b) *self-targeted* and primarily aims to benefit the actors themselves rather than others, such as teams or organizations (e.g., Greenhaus et al., 2019). Based on the reference to goal processes in many definitions, CSM is (c) *intentional*, requiring a certain degree of deliberation (King, 2004), and (d) *goal-directed*, involving activities to reduce the discrepancy between current states and desired goal states. Recent conceptualizations agree that CSM is related to personally relevant career goals (Greenhaus et al., 2019) that aim to enhance person–environment fit (Klehe et al., 2021; Parker & Collins, 2010). Because the notions of career and person–environment fit are relatively unspecific in existing definitions of CSM, we propose that the goal-aspect of CSM should be reformulated with reference to definitions of career as an unfolding sequence of work experiences over time within and outside of organizational

contexts (Sullivan, 1999). Hence, CSM (e) *aims to bring about mid- to long-term changes in work-related experiences within and outside organizational contexts*. This distinguishes CSM from constructs that also aim to enhance work-related experiences but have a shorter time frame, such as recovery activities (Sonnentag et al., 2022) and from older conceptualizations of CSM as taking place within an organization (Gould & Penley, 1984). Moreover, it distinguishes CSM from job crafting, which takes place only within an organizational context in the sense that it is restricted to changes within a work role (Bruning & Campion, 2018). In contrast, CSM, which encompasses job crafting activities, may also take place outside organizational contexts.

The extant definitions also distinguish between the process of CSM, often described in self- or action regulation terms, and the various CSM behaviours involved in this process, such as career planning (e.g., Bindl et al., 2012; Greenhaus et al., 2019). CSM, therefore, involves (f) *behaviours that are regulated in a process of action regulation*, wherein individuals develop and adapt goals, map available resources and barriers for goal attainment, develop plans and execute actions for goal attainment, and monitor and process feedback regarding their actions (Hirschi & Koen, 2021; Klehe et al., 2021). Finally, there is consensus that CSM is a (g) *multidimensional* construct comprising multiple overt and covert behaviours (or cognitions) which are correlated but distinct (Gould & Penley, 1984; Hirschi & Koen, 2021).

In conclusion, we define CSM as a multidimensional process wherein individuals develop and adapt goals, map available resources and barriers for goal attainment, develop plans and execute actions for goal attainment, and monitor and process feedback regarding their actions. Involved in this process are multiple CSM behaviours, which we define *as intentional, self-initiated, and self-targeted behaviours aiming at substantially enhancing work-related experiences in the mid- or long-term within and outside of organizational contexts*.

## STUDY 1: IDENTIFYING KEY CSM BEHAVIOURS

Having clarified the conceptualization of the CSM construct, we aimed to identify key CSM behaviours, seen as dimensions within a multidimensional CSM behaviour construct. While multidimensional conceptualizations of CSM behaviour have been proposed for decades (e.g., Gould & Penley, 1984), the literature still suffers from a lack of systematic integration of the various behaviours studied under the CSM umbrella. Given the lack of clarity on the core attributes of CSM, extant conceptualizations include behaviours that do not fit the definition of CSM (e.g., in-role performance, Francis-Smythe et al., 2013) or exclude behaviours that fit the definition of CSM (e.g., career exploration; Strauss et al., 2012). Furthermore, conceptualizations suffer from jingle-jangle fallacies (Kelley, 1927) and use the same term to describe two different dimensions (i.e., jingle fallacy) or different terms to describe the same dimension (i.e., jangle fallacy). As an instance of the jingle fallacy, various studies have used the term career planning as *developing* a career plan (e.g., Bindl et al., 2012), whereas others have operationalized the term as *having* a career plan (e.g., Gould, 1979). As an instance of the jangle fallacy, various terms have been used for the development of knowledge, skills, and abilities, such as competence development activities (Ok & Vandenberghe, 2016), proactive skill development (Strauss et al., 2012), or continuous learning (London & Smither, 1999). To resolve these issues, we aimed to identify the most central CSM behaviours more systematically by integrating previous models and scale development efforts of CSM.

First, we conducted a systematic literature review to identify potential CSM behaviours studied in previous research. Second, these potential CSM behaviours were coded based on thematic analysis (Braun & Clarke, 2006) to yield a list of specific behaviours that served as first-order content aspects. Third, we sorted the behaviours into overarching dimensions guided by content models of CSM (e.g., Akkermans et al., 2013; Inkson & Arthur, 2001). We chose these content models as they categorize the resources that CSM builds, maintains, and/or uses.

## Methods

First, we searched Web of Science in 2019 with search terms for CSM and similar terms (i.e., “career management,” “career self-management,” “career behaviour,” “career strategies,” and “enacted managerial aspirations”) in title, abstract, and/or key words for published articles. As we expected that some behaviours studied in the proactive behaviour literature might also be consistent with our definition of CSM behaviour, we further searched Web of Science for reviews and overview articles on proactive work behaviour with search terms “proactive behaviour,” “proactivity,” “personal initiative” in conjunction with document type “review.” In addition to these database results, we identified articles on career self-management and proactive work behaviour cited in review articles and meta-analyses obtained through the keyword search. This procedure yielded an initial set of 532 references.

Second, the first and third author then coded the abstracts of these references regarding the presence of CSM behaviours potentially matching our definition of CSM. To ensure that both authors had a consensual perspective on the procedure and criteria for the inclusion of references, the authors coded a set of 10 identical abstracts and discussed any disagreements until a consensus emerged. In this step, 360 references were discarded because they did not feature any potential CSM behaviours in the abstract, resulting in 172 full articles for further study.

Third, we assessed whether the remaining full articles featured potential CSM behaviours, and 22 articles did not feature any CSM behaviour constructs, resulting in a final sample of 150 articles. From these articles, we extracted 119 potential CSM behaviour constructs with names, definitions/descriptions, and, in the case of quantitative articles, operationalizations to be used as the dataset for thematic analysis (Braun & Clarke, 2006). The 119 potential CSM behaviour constructs were coded to derive a list of specific behaviours. All authors independently reviewed each construct regarding inclusion/exclusion based on their fit to our definition and identified core attributes of CSM (e.g., is the construct self-targeted rather than other-targeted; is the construct a behaviour rather than an attitude or ability). This led to the exclusion of 33 constructs because they did not represent the key attributes of CSM that we have identified above (e.g., extended work involvement was excluded because it blurs boundaries between CSM and workaholism; political skill was excluded because it is conceptualized partially as an ability). We also rated overlap and redundancy across identified behaviours and merged redundant constructs based on the content of their definitions. Furthermore, we reviewed whether the merged construct was internally homogeneous while being distinct from other behaviours. For example, other enhancement, opinion conformity, and interpersonal attraction were merged into ingratiation, because they represent various behaviours with the purpose of increasing likeability of oneself by target persons (Bolino et al., 2016). In case of disagreement on any of the reviewed aspects (inclusion, redundancy, definition), we reached a consensus through discussion and re-evaluation. This step resulted in 19 specific CSM behaviours.

We updated the literature search in 2023 using two search strategies, based upon recommendations from reviewers. First, we searched the Scopus database for articles published 1980 or later with the same search strings as the previous Web of Science search for CSM and proactivity. Second, we conducted a complementary forward search (Harari et al., 2020) based on three influential early articles on CSM (Gould & Penley, 1984; King, 2004; Sturges et al., 2002). This procedure yielded further 1456 non-duplicate references. The first author coded the abstracts of these references regarding the presence of CSM and included 512 references as full papers. From these, the first author extracted 221 potential CSM behaviours. Next, the first author coded these as unique or redundant with the 19 behaviours identified in the first round of literature reviews. After removing 199 redundant behaviours, we included 22 new CSM behaviour construct candidates. The first and third author then coded these candidates independently in terms of fitting with the definition of CSM behaviour (1 = yes, 0 = no) and, if coded as CSM behaviour, as unique or redundant with other identified CSM behaviours. In case of disagreement on the reviewed aspects (fit with definition, redundancy or uniqueness), we reached a consensus through discussion and re-evaluation. We identified 20 behaviours as fitting with the definition of CSM

behaviour. Of these, we identified 10 as redundant and merged the other 10 into 3 new CSM behaviours (i.e., building a mentor relationship, career reflection, and career goal and action strategy revision) that we added to the CSM behaviours identified in our original literature review, resulting in 22 specific CSM behaviours (Table S1 in the Supporting Information lists the behaviours, their description, and selected studies).

## Results

Building on the 22 identified CSM behaviours, we aimed to derive an integrative framework of key CSM behaviours that is parsimonious but also fine-grained enough to be of broader theoretical and practical relevance. For instance, behaviours should be applicable for different age groups and different career transitions, such as school-to-work transitions (Zacher & Froidevaux, 2021). Considering the specific nature of the represented CSM behaviours, we collated the identified 22 CSM behaviours into overarching dimensions/themes based on thematic analysis of their contents (Braun & Clarke, 2006) and under consideration of content models of CSM. Content models suggest that CSM behaviours can be differentiated by the capitals (Inkson & Arthur, 2001), resources (Hirschi, 2012), or competencies (Akkermans et al., 2013) which the behaviour develops, uses, or maintains in terms of social capital/knowing-whom, human capital/knowing-how, and identity/knowing-why (Arthur et al., 1995; Defillippi & Arthur, 1994). Moreover, these capitals, resources, or competencies can be either organization-specific or transferable across organizations (Inkson & Arthur, 2001), suggesting that some behaviours may have an explicitly organization-external direction. We chose content models rather than process models of CSM to identify key behaviours because the different phases proposed in process models (such as goal setting, development of action strategies) can often not be distinguished empirically due to the dynamic nature of processes in which actors may switch frequently between phases (Abele & Wiese, 2008; Hirschi et al., 2021; Turban et al., 2009). Based on these considerations, we identified seven key CSM behaviours: (a) impression management, (b) building social contacts, (c) using social contacts, (d) human capital development, (e) career goal setting and planning, (f) self-exploration, and (g) mobility-oriented CSM behaviour (see Table 1 for definitions and Figure 1 for a graphic representation).

## Discussion study 1

In sum, the integrative framework developed in Study 1 consists of seven key CSM behaviours, which we identified based on a thematic analysis of the various behaviours studied in the literature. The seven CSM behaviours tap into diverse content domains and can be meaningfully linked to specific capitals, resources, or competencies identified in the wider career development literature. Hence, the integrative framework provides a comprehensive but succinct model of the behaviours through which persons direct their careers and manage their career-related resources. It extends existing frameworks by being more comprehensive in the included key CSM behaviour domains while also clearly differentiating behaviours according to the key content domains of CSM targets (e.g., building social capital vs. building human capital). We exemplify this by comparing the integrative framework with influential and widely used frameworks by King (2004) and the proactive career behaviour framework (Claes & Ruiz-Quintanilla, 1998; Strauss et al., 2012). King (2004) organizes CSM behaviours into three broad categories: positioning strategies, influence strategies, and boundary management, each with several sub-behaviours. The three categories were derived inductively from an exploratory factor analysis (King, 2003), but are not meaningfully linked to the content-models of CSM described above. For instance, positioning strategies collapse building contacts and human capital development into a single category, although social and human capital are clearly differentiated. Furthermore, boundary management is not aimed primarily at enhancing work

TABLE 1 Key CSM (career self-management) behaviours identified in study 1.

Key CSM behaviour	Definition	Behaviours subsumed
Building social contacts	Building and maintaining contacts with others which may be used to promote one's career development.	Relationship building, networking, building mentor relationships
Using social contacts	Using social contacts to promote one's career development.	Seeking guidance, feedback inquiry, social job resource crafting, negotiating
Impression management	Behaviours that people use to influence the image others have of them	Self-promotion of capabilities, self-promotion of aspirations, ingratiation
Human capital development	Enhancing one's knowledge, skills, and abilities through formal and information learning activities and expansion of one's work role	Skill development, structural job resource crafting, challenge job resource crafting
Goal setting and planning	Developing, appraising, and selecting career goals and corresponding action strategies/plans	Goal development and selection, career decision-making, development of action strategies, goal and action strategies revision
Self-exploration	Exploration and reflection involving career-related experiences, qualities (knowledge, skills, and abilities), and motivations	Self-exploration of motives, self-exploration of qualities, career reflection
Mobility-oriented behaviour	Behaviours that are oriented towards the organization-external environment and the pursuit of job mobility	Environmental exploration, job search

experiences, but rather regulates the interface between work and other life domains, blurring the distinction between CSM and related constructs and resulting in potential construct contamination. The proactive career behaviour framework (Claes & Ruiz-Quintanilla, 1998; Strauss et al., 2012) features four behaviours that relate to building contacts, using contacts, human capital development, and career goal setting and planning, but omits impression management, self-exploration, and mobility-oriented behaviour, thereby neglecting significant and widely studied content domains of CSM. In sum, our integrative framework shares important similarities with prior frameworks of CSM behaviour but addresses issues regarding construct limitations and contamination that affect these prior frameworks.

## STUDY 2: HIGHER-ORDER STRUCTURE AND CONSEQUENCES OF CSM BEHAVIOURS

In the second study, we aimed to empirically confirm the seven key CSM behaviours and test how the conceptually and empirically identified seven key CSM behaviours relate to the overarching CSM construct. We also wanted to extend research on the nomological net of CSM by testing the assumption that the different key CSM behaviours are uniquely related to facets of employability.

### Confirming key CSM behaviours using a newly developed measure

After an evaluation of prior CSM behaviour scales that we identified along our literature review in Study 1, we decided that it was necessary to develop a new measure to assess the identified key behaviours because no prior scale sufficiently captures all key behaviours. Furthermore, many of the most widely used measures do not meet best-practice standards of scale development (e.g., Hinkin, 1998; Lambert & Newman, 2022), resulting in psychometric and construct validity issues such as low scale reliability (e.g., Cronbach's  $\alpha < .70$ ; Sturges et al., 2002) or low model fits (e.g., Strauss et al., 2012).



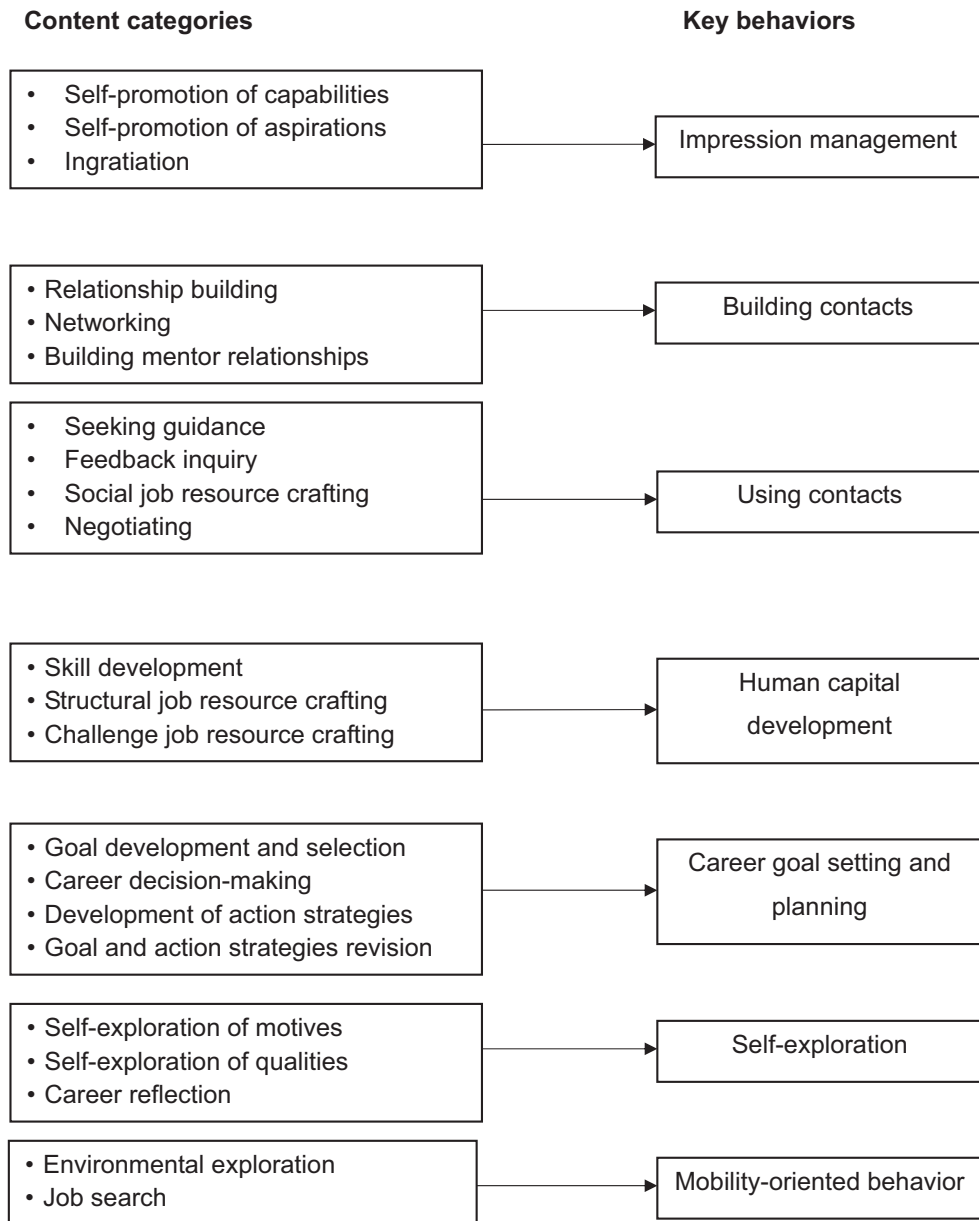


FIGURE 1 Identified content categories and key behaviours.

Hence, we aimed to develop a new multidimensional measure of CSM in accord with our derived key dimensions. To do this, we followed best-practice scale development practices (Clark & Watson, 1995, 2019; Hinkin, 1995, 1998; Lambert & Newman, 2022) and aimed to demonstrate substantive validity (i.e., ensuring items that match the construct definitions), structural validity (i.e., item selection and psychometric evaluation) and external validity (i.e., convergent, discriminant, and incremental validity). We proceeded in multiple steps, (a) item development, (b) confirmatory factor analyses of the first-order dimensions, item reduction, and replication of the first-order factor structure in an independent sample, (c) examination of convergent and discriminant validity with related constructs and measures, and (d) examination of incremental validity with related constructs and measures.

## Relation of specific CSM behaviours to the general construct

To arrive at a clearer understanding of the multidimensional nature of CSM behaviour, it is important to specify how the seven identified key behaviours relate to the overarching construct (MacKenzie et al., 2011). Many multidimensional constructs assume that the individual dimensions are correlated with each other but do not specify a general dimension that explains these correlations. In measurement theory, this is referred to as a first-order correlated factors model (Eid et al., 2017). Although its use is widespread within the CSM literature, there are several problems with this model. First, theories argue that individual CSM behaviours are embedded within a process of action regulation (Greenhaus et al., 2019; Hirschi & Koen, 2021; Klehe et al., 2021), suggesting the existence of a general dimension that explains the shared associations. Second, individual CSM behaviours are often highly correlated (e.g., De Vos et al., 2009; Sturges et al., 2002), but these correlations remain unexplained in a first-order factors model. Third, because no general dimension is postulated, research into the nomological network of CSM behaviours is constrained to the level of the individual behaviours, which prevents investigating whether common or unique variance of CSM behaviours is more important in the prediction of outcomes.

To address this limitation, the overarching construct level of CSM behaviour could be explicitly represented as a general dimension. We define the general dimension of CSM behaviour as the overall engagement across the spectrum of possible CSM behaviours, irrespective of engaging in any specific behaviour. Such a general dimension can be understood in two different conceptualizations, either as a second-order factor in a higher-order model or as a general factor in a bifactor model. In the higher-order model, the general dimension, because it is broader than the specific dimensions, determines the engagement in the specific dimensions as its subordinate first-order dimensions and explains why these dimensions are related to one another (e.g., Strauss et al., 2012). Problematically, however, the first-order dimensions should not have distinct nomological nets (in terms of unique relations to antecedents and outcomes) in such a model, as they represent redundant indicators of the general construct (MacKenzie et al., 2011). This conceptualization is thus implausible because it is inconsistent with research suggesting distinct nomological nets for specific CSM behaviours (e.g., De Vos et al., 2009; Sturges et al., 2002).

In the bifactor model, the general dimension and specific dimensions capture distinct aspects of CSM behaviour without being in a hierarchical relation to one another: The general dimension captures the aspects that are shared across all behaviours, whereas specific dimensions capture unique aspects of the individual CSM behaviours that are not accounted for by the general dimension. Because the general and specific dimensions are distinct, the specific dimensions can have nomological nets distinct from those of other specific dimensions and the general dimension (Bornovalova et al., 2020; Eid et al., 2017). For example, a narrow construct, such as occupational expertise, may be uniquely related to the specific CSM behaviour of human capital development, while a broader construct, such as career satisfaction, may be mainly related to a general CSM factor. For these reasons, we argue that the bifactor model is the theoretically soundest of these possible models and hypothesize that empirically, it will have the highest model fit relative to alternative models.

**Hypothesis 1.** The relation of the specific CSM behaviours to the general CSM construct is best represented as a bifactor model with a general dimension and seven specific dimensions.

## Consequences of CSM behaviours

To further advance theorizing on CSM and show the validity of our multidimensional approach to CSM, we next explicate the unique relation of specific CSM behaviours to facets of employability (i.e., career potential in the labour market). It has been studied in different strands of research: as personal strengths that increase employment chances, as self-perceived employment opportunities, and

as observable job transitions (van Harten et al., 2022). We herein focus on employability in relation to CSM because employability is an important career outcome and because employability theory suggests that employability is a set of personal strengths that can be developed through activities such as CSM (e.g., Arthur et al., 1995; Forrier et al., 2015). Demonstrating that specific CSM behaviours are linked to specific facets of employability can therefore validate our approach towards CSM in which specific behaviours are supposed to be linked to specific career outcomes.

Moreover, linking specific CSM behaviours to specific facets of employability extends prior theorizing in the CSM and employability literature. The CSM literature rarely specifies which behaviours are distinctly linked to specific outcomes. When it does study the relation of specific behaviours to outcomes, it usually happens in a piecemeal fashion where behaviours are studied in isolation, but without controlling for the effects of other behaviours on the hypothesized outcome. This is problematic as CSM behaviours are correlated, and without controlling for other behaviours, it remains unclear to what extent effects of behaviours are truly specific to a particular behaviour. Likewise, research on employability generally recognizes that CSM behaviours build, maintain, and use employability resources but rarely specify which behaviours are relevant for which facet of employability (e.g., Forrier & Sels, 2003).

To conceptualize employability as a set of personal strengths and resources, we follow the movement capital framework (Forrier et al., 2015) because it clearly defines its dimensions, explicitly connects movement capital to activities that enhance and develop movement capital (such as CSM behaviour), and has received the most substantial support among competing frameworks in a recent meta-analysis (Harari et al., 2021). Movement capital has four dimensions: human capital, social capital, self-awareness, and adaptability. Human capital represents the knowledge, skills, and abilities necessary to perform a job or occupation (Fugate et al., 2004). We hypothesize that human capital development behaviour will add incremental variance in the prediction of human capital, measured by occupational knowledge. Social capital refers to the social contacts and networks that support persons in their career development (Fugate et al., 2004). We expect that building social contacts behaviour will add incremental variance in the prediction of social capital, measured by the breadth of internal and external networks (Porter et al., 2016). Self-awareness refers to people's knowledge about their career-related goals, strengths, and weaknesses. We hypothesize that goal setting and planning behaviour will add incremental variance in predicting self-awareness, measured by career goal clarity. Finally, adaptability represents the readiness and ability to change in response to environmental demands (Forrier et al., 2015). Because this is a broad construct, we assume it is related more to CSM behaviour on a general level rather than its specific behaviours. However, job market knowledge can be seen as a specific facet of adaptability that enables workers to adapt their careers to the changing demands of the job market. We hence expect mobility-oriented CSM behaviour, because it captures the extent to which persons stay up-to-date with trends and opportunities in the labour market, to be related to job market knowledge (as a specific indicator of adaptability), over and above the other dimensions of CSM behaviours. In addition to employability as personal strengths and resources, we addressed the conceptualization of employability as job transitions by considering received job offers in the past months, a proximal predictor of such transitions (e.g., Porter et al., 2016). We expect that mobility-oriented behaviour should be related to received job offers over and above other dimensions of CSM.

**Hypothesis 2a.** Human capital development CSM behaviour adds incremental variance to the prediction of occupational knowledge over and above the other CSM behaviour dimensions.

**Hypothesis 2b.** Building social contacts CSM behaviour adds incremental variance to the prediction of the breadth of internal and external networks over and above the other CSM behaviour dimensions.

**Hypothesis 2c.** Goal setting and planning CSM behaviour adds incremental variance to the prediction of career goal clarity over and above the other CSM behaviour dimensions.

**Hypothesis 2d.** Mobility-oriented CSM behaviour adds incremental variance to the prediction of job market knowledge over and above the other CSM behaviour dimensions.

**Hypothesis 2e.** Mobility-oriented CSM behaviour adds incremental variance to the prediction of job offers over and above the other CSM behaviour dimensions.

## Methods

Throughout the various analyses in Study 2, we used two different samples. We developed and validated the new multidimensional measure of CSM behaviours using both samples. We evaluated the relation of specific CSM behaviours to the general construct using Sample 1 and replicated our model in Sample 2. Furthermore, Sample 1 was used to examine the relations of CSM behaviours to facets of employability.

### Sample 1

The sample was recruited in Germany using online panel provider Respondi during November and December 2021. Participants had to be employed for at least 16 h per week and aged between 18 and 65. We used a time-lagged approach to reduce common method bias and measured CSM behaviours and controls at T1 and employability indicators 2 weeks later at T2. Participants were each paid €3.15 for completing T1 and €2.95 for completing T2. A total of 695 persons completed the T1 survey. Following existing recommendations for the detection of careless responding (Curran, 2016), we removed 159 (22.9%) responders using multiple criteria of careless responding (i.e., failed 2 or 3 out of 3 attention check items, such as “Please choose *not at all* to show your attention”; or less than 2 s response time per Likert item; or outlier [ $\geq 3 SD$  above the mean] on Longstring index and Mahalanobis distance), retaining 536 (77.1%). Two weeks later, 417 persons completed the T2 survey, out of which 371 (69.2% of valid T1 responders) were retained after removing 46 (11%) careless responders using the same criteria as at T1.

Participants at both time points did not differ by impression management, building contacts, and self-exploration at T1 from participants who participated only at T1. The two groups showed significant differences in age, gender, organizational tenure, using contacts, human capital development, goal setting and planning, and mobility-oriented behaviour (Cohen's  $d$  ranging from  $|.19|$  for gender to  $|.59|$  for age; full information available upon request). To deal with missingness, we used full-information maximum likelihood estimation (FIML) in our analyses as it includes all available data (Newman, 2014) which is non-biased under the assumption of missing at random (MAR). Because we applied FIML to address missing data, the final sample comprised 536 participants.

The final sample was 46% female and, on average, 47.1 years old ( $SD=11.1$ ). Most were of German nationality (98.7%), with a permanent employment contract (94.0%), and worked in a variety of occupations such as healthcare (13%), commerce (10%), and manufacturing (9.3%). Participants worked an average of 35.9 h per week ( $SD=7.1$  h) and had been in their jobs for 12.5 years ( $SD=10.5$  years); 18.2% of participants held a tertiary degree.

### Sample 2

Sample 2 was recruited in Germany using Respondi Panel during April 2022 with the same inclusion criteria as in Sample 1. Participants who already participated in Sample 1 were not contacted. Participants were each paid €2.25. A total of 787 completed the survey, and we excluded 258 (32.8%) participants based on the same criteria of careless responding as in Sample 1, resulting in a final sample size

of 529 (67.2%). The sample was 46% female and, on average, 41.3 years old ( $SD = 13.1$ ). Most of the sample was of German nationality (97.2%), with a permanent employment contract (90.0%), and worked in a variety of occupations such as commerce (10.2%), healthcare (8.9%), and manufacturing (8.5%). Participants worked an average of 36.8 h per week ( $SD = 8.7$  h) and had been in their jobs for 10.8 years ( $SD = 10.8$  years). About two-thirds (61.6%) had a vocational degree, while 28.4% had a tertiary degree.

## Measures

Unless noted otherwise, respondents were asked to indicate to what extent they agreed to the given statements, using a 5-point Likert-type scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Reliabilities for all measures used in Sample 1 are reported in Table 2 and for Sample 2 in Table 3.

### *Career self-management behaviour*

The final 24-item version of the newly developed CSM behaviour measure used in all hypotheses tests is comprised of seven subscales measuring the identified key behaviours in Study 1 (Table 1) with three items each plus three items that directly measure the general dimension. The scale asks participants to what extent they had engaged in the listed behaviours in the past 6 months on a 5-point Likert scale ranging from 1 (*never*) to 5 (*a great deal*). The scale was used in Samples 1 and 2. Cronbach's alpha ranged from .76 (impression management) to .92 (mobility-oriented behaviour) in Sample 1, and from .75 (impression management) to .93 (mobility-oriented behaviour) in Sample 2.

The appendix provides the list of all final items and a detailed description of the scale development and validation process. First, we used a deductive item development approach, generating items in accord with the definitions of the key behaviours developed in Study 1. To ensure substantive validity of items, we adapted matching validated items from prior measures where possible. We used a large body of validated items from prior measures collected during the literature review in Study 1. The resulting item pool consisted of 57 items with 4–10 per dimension.

Second, to establish structural validity and confirm the hypothesized seven-factor structure developed in Study 1, we ran a series of confirmatory factor analyses (CFA). After removing one item due to problematic response distribution, we submitted the 56 remaining items to a CFA using Sample 1, with each of the 56 items loading onto their specified factor. The CFA showed adequate model fit on some but not all fit indices and superior fit to alternative models in which various dimensions were collapsed based on theoretical rationales. To improve fit and reduce scale length, we selected 3 items per dimension based on content and psychometric criteria and tested and replicated the revised model in Samples 1 and 2. Across both samples, this model showed a good fit to the data, high item loadings, and reliable measurement of dimensions.

Third, to establish discriminant and convergent validity with related constructs and measures, we examined the measure's relation to job crafting using the Job Crafting Scale (Tims et al., 2012), and three prior measures of CSM behaviour (Hirschi et al., 2013; Strauss et al., 2012; Sturges et al., 2002). Results using latent correlations derived through structural equation models indicated that the newly developed scale in its dimensions positively related to job crafting and prior CSM scales in their dimensions. Furthermore, analyses of discriminant validity using the Fornell-Larcker criterion (Fornell & Larcker, 1981) and guidelines for assessing discriminant validity (Rönkkö & Cho, 2022) suggested that overall, the newly developed scale can be largely discriminated from job crafting and prior measures of CSM behaviour, with a small subset of dimensions showing marginal problems of redundancy with some of the dimensions of the related measures.

Fourth, to establish incremental validity, we compared the incremental variance explained by the newly developed CSM measure over and above job crafting, prior CSM behaviour scales, and sociodemographic controls (i.e., gender, age, and organizational tenure) for the outcomes career satisfaction and person-job fit in a series of hierarchical multiple regressions. These analyses indicated that, compared to job crafting and prior CSM behaviour scales, the newly developed CSM behaviour measure significantly explained incremental variance.

TABLE 2 Correlations and summary statistics of focal study variables in sample 1.

Variable	<i>M</i>	<i>SD</i>	$\alpha$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Age	47.08	11.06		–															
2. Gender	1.54	.50	.11																
3. Organizational tenure	12.52	10.50	.38	.08															
4. Impression management	2.45	1.01	.76	-.25	.06	-.07													
5. Building social contacts	2.00	1.05	.88	-.21	.10	-.10	.58												
6. Using social contacts	1.87	1.00	.86	-.29	.07	-.10	.55	.69											
7. Human capital development	2.62	1.12	.86	-.20	.12	-.06	.52	.57	.57										
8. Goal setting and planning	2.11	1.13	.92	-.25	.08	-.13	.51	.70	.70	.56									
9. Self-exploration	3.05	1.11	.89	-.23	-.01	-.11	.48	.45	.47	.48	.52								
10. Mobility-oriented behaviour	2.13	1.22	.92	-.33	.01	-.21	.37	.44	.50	.29	.55	.48							
11. General career self-management	2.25	1.17	.94	-.28	.07	-.12	.55	.65	.69	.56	.77	.59	.60						
12. Occupational expertise	3.57	.91	.82	.12	.21	.09	.12	.20	.16	.26	.15	.09	.02	.13					
13. Breadth of internal networks	3.15	1.12	.92	.00	.04	.17	.22	.32	.28	.29	.23	.14	.07	.22	.42				
14. Breadth of external networks	2.79	1.09	.89	-.02	.09	.10	.29	.43	.38	.34	.35	.23	.18	.31	.40	.70			
15. Career goal clarity	3.28	1.12	.93	-.09	.16	.00	.20	.38	.36	.31	.44	.23	.15	.39	.35	.35	.50		
16. Job market knowledge	3.13	.86	.87	-.05	.15	-.06	.21	.38	.37	.30	.38	.27	.28	.32	.41	.36	.48	.50	
17. Job offers	1.26	.43		-.10	.05	-.21	.14	.31	.31	.23	.30	.19	.36	.34	.11	.09	.22	.20	.33

*N*/*n*: *N* = 374–536. Missing data at T2 was handled using FIML as recommended by Newman (2014) and the table reports the model-implied means, standard deviations, and correlation coefficients. Gender, 0 = female, 1 = male. Variables used exclusively in the appendix are not displayed. All correlations  $|r| \geq .11$  are significant at  $p < .05$ . All correlations  $|r| \geq .14$  are significant at  $p < .01$ . All correlations  $|r| \geq .18$  are significant at  $p < .001$ .

TABLE 3 Correlations and summary statistics for variables in sample 2.

Variable	<i>M</i>	<i>SD</i>	$\alpha$	1	2	3	4	5	6	7
1. Impression management	2.67	.99	.75	–						
2. Building contacts	2.35	1.05	.86	.62	–					
3. Using contacts	2.10	1.07	.89	.60	.74	–				
4. Human capital development	2.77	1.13	.90	.59	.58	.63	–			
5. Goal setting and planning	2.58	1.16	.92	.52	.57	.66	.60	–		
6. Self-exploration	3.38	.96	.84	.51	.48	.52	.60	.64	–	
7. Mobility-oriented behaviour	2.38	1.22	.93	.41	.42	.55	.44	.52	.46	–
8. General career self-management	2.49	1.26	.94	.55	.63	.73	.69	.76	.64	.65

Note:  $N = 529$ . All correlations  $|r| \geq .11$  are significant at  $p < .05$ . All correlations  $|r| \geq .14$  are significant at  $p < .01$ .

Fifth, we conducted measurement invariance analysis regarding group differences in age, gender, and organizational tenure. Results using Sample 2 indicated that the measure shows configural and metric invariance across the examined groups. Scalar invariance was confirmed for organizational tenure, but not age and gender, suggesting that participants of different gender or age respond differently to some items. Complementary item-focused tree analyses suggested that in terms of effect sizes, differential item functioning was negligible for age.

#### *Facets of employability*

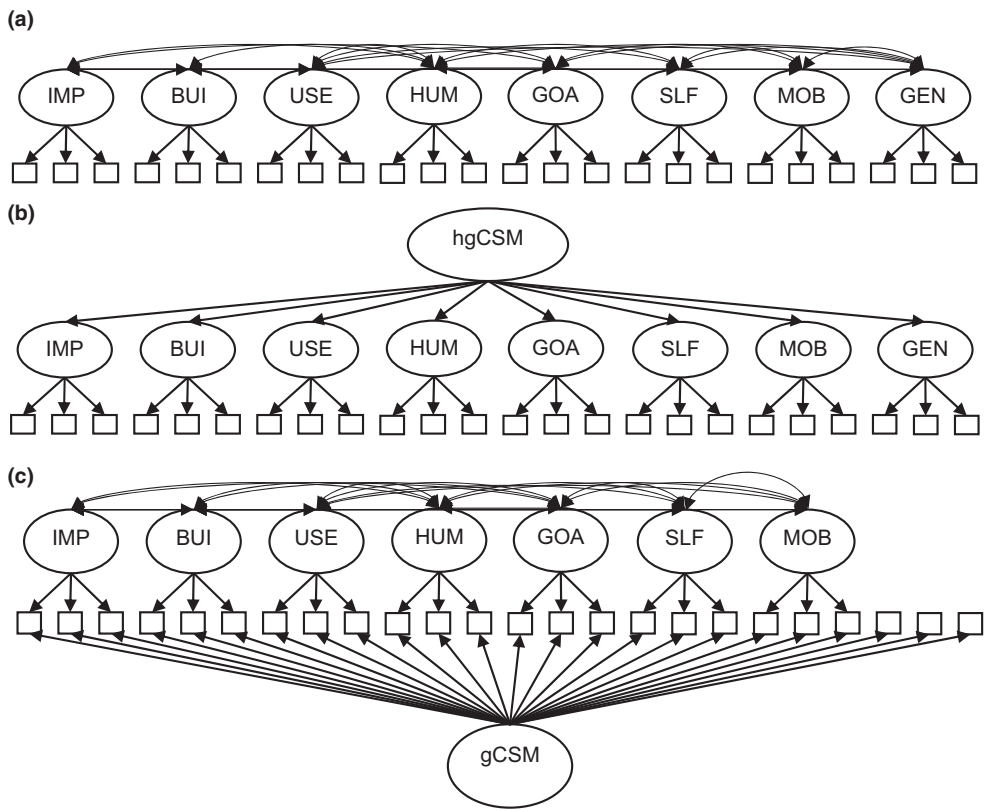
All facets of employability were assessed in Sample 1 at T2. We measured *occupational expertise* using the six highest loading items from the Occupational Expertise scale from Heijde and Heijden (2006). A sample item is “I consider myself competent to provide information on my work in a comprehensible way.” We measured the *breadth of networks* using the 6-item scale from Eby et al. (2003). The scale consists of three items measuring the breadth of internal networks (e.g., “Co-workers say that I know a lot of people within the organization”) and three items measuring the breadth of external networks (e.g., “Co-workers say that I know a lot of people outside the organization”). We measured *career goal clarity* using a three-item scale from Hirschi et al. (2018). A sample item is “I have clear career goals.” We measured *job market knowledge* using the 6-item occupational awareness subscale of the Career Futures Inventory-Revised (Rottinghaus et al., 2012). A sample item is “I am good at understanding job market trends.” We measured *job offers* with an item by Porter et al. (2016), “Within the past 12 months, have you received one or more job offers?” (1 = *yes*, 0 = *no*).

#### *Control variables*

Moreover, we considered the potential control variables gender (0 = female, 1 = male), age (in years), and organizational tenure (in years). Previous research suggests that gender may influence the frequency with which individuals engage in specific CSM behaviours such as impression management and the effectiveness of CSM behaviours in promoting employability (Bolino et al., 2016). These findings can be explained through gender role theory (Eagly et al., 2000) which suggests that individuals enacting CSM do so in the light of expected and assumed gender roles, and observers use gender-based expectations to interpret these behaviours. Age also may relate to CSM, however in what precise way is unclear possibly due to differing effects across CSM behaviours (Kooij, 2015). Theory suggests that shifts in goal orientation may affect CSM behaviours, as older employees shift their goals away from growth (e.g., developing new skills) towards maintenance and the regulation of loss of competencies (Zacher & Froidevaux, 2021). Organizational tenure has been linked negatively to CSM behaviours (Nabi, 1999). Socialization resources theory suggests that employees with longer tenure may have achieved socialization into the job and organization which may reduce the extent to which employees engage in CSM (Saks & Gruman, 2012). Thus, to eliminate alternative explanations and to demonstrate the unique relationship between CSM behaviours and employability indicators, we controlled for the effects of gender, age, and organizational tenure.

### Data analyses

To compare the fit of the hypothesized bifactor model against its alternatives (Hypothesis 1), we ran a series of Confirmatory Factor Analyses (CFA) with robust Maximum Likelihood (ML) estimation using the R package *lavaan* (Rosseel, 2012). We operationalized the bifactor model as a bifactor-(S-1) model (Eid et al., 2017) with one G-factor for the general dimension and multiple S-factors for the specific behaviours (for a visual depiction, see Figure 2). The bifactor-(S-1) model uses a reference domain to define the G-factor, which has been shown to have preferable psychometric qualities compared to the traditional bifactor model in which the G-factor has no reference domain (Eid et al., 2017; Zhang et al., 2021). Because the reference domain anchors the meaning of the G-factor, we defined it as the general extent to which persons engage in CSM behaviours. To measure the reference domain, we adapted three validated items from Hirschi et al. (2013) that were developed to capture the general extent of engagement in CSM and showed the highest factor loadings on their unidimensional CSM behaviour scale. Each item loads onto its S-factor and the G-factor, excluding the items for the reference domain. The items for the reference domain load only onto the G-factor and thereby define the meaning of the G-factor. We operationalized the second-order factor model as 1 s-order factor with eight first-order factors as indicators, which in turn have their respective items as indicators. The first-order factors were the seven specific behaviours and a factor for the



**FIGURE 2** Visualization of the examined confirmatory factor analysis models. *Note.* (a) correlated factors model, (b) second-order factor model, (c) bifactor-(S-1) model. Error variances omitted for legibility. BUI, building contacts; gCSM, general dimension; GEN, general engagement; GOA, goal setting and planning; hgCSM, hierarchical general dimension; HUM, Human capital development; IMP, impression management; MOB, mobility-oriented behaviour; SLF, self-exploration; USE, using contacts.



general extent of CSM behaviour with the same three items used for the reference domain in the bifactor model. As a baseline model, we operationalized the correlated-first order factor model with the same eight first order-factors as in the second-order factor models, allowing all factors to correlate with one another.

To test Hypotheses 2a–2c concerning the incremental explanatory value of specific CSM behaviours over and above others, we used Structural Equation Modelling (SEM) with robust ML estimation with the R package *lavaan*. To deal with missing data because of the time-lagged analyses, we used Full Information Maximum Likelihood. For each employability indicator, we created a model with the general dimension, the seven specific CSM behaviours, and control variables as predictors and the employability indicator as the outcome.

We first inspected the model results to test if the hypothesized specific CSM behaviours had significant effects when all other CSM dimensions were included. We then proceeded to estimate the incremental variance explained by the target CSM behaviour using the method proposed by Hayes (2021) with 1000 bootstraps, which calculates point estimates, bootstrapped standard errors, and percentile confidence intervals of  $\Delta R^2$ . We also compared models with control variables to models without control variables to see if controls change the pattern of results.

## Results

### Relation of specific CSM behaviours to the general construct

We compared the fit of the bifactor model against the fit of the second-order order and the correlated first-order factors models. Confirming Hypothesis 1, the analyses showed that the bifactor-(S-1) model fit the data best in both Samples 1 and 2 (see Table 4). This model showed excellent fit to the data and fit the data significantly better than the second-order factor model and the correlated first-order factor model in terms of absolute and incremental fit differences. In the hypothesized bifactor model in Sample 2, factor loadings for the G-factor ranged from .39 to .93, and factor loadings for the S-factors ranged from .42 to .72 (see Appendix Table A2). Consistency values (proportion of true item variance accounted for by the G-factor) in Sample 2 were, on average, medium with  $M = .54$  ( $SD = .12$ , range .36 to .72).

TABLE 4 Comparisons of first-order, hierarchical, and bifactor CFA models.

Model	$\chi^2$	df	CFI	TLI	RMSEA	SRMR	$\Delta\chi^2$	$\Delta\chi^2$ p-value	$\Delta$ CFI
Sample 1 (N = 536)									
Correlated first-order factors	362.49***	224	.983	.979	.038	.032			
Second-order factor	477.52***	244	.971	.968	.047	.048	106.30***	<.001	.012
Bifactor-(S-1)	330.86***	210	.985	.981	.036	.025	30.22**	.006	.002
Sample 2 (N = 529)									
Correlated first-order factors	440.86***	224	.976	.971	.046	.042			
Second-order factor	606.83***	244	.960	.955	.057	.055	153.00***	<.001	.016
Bifactor-(S-1)	325.27***	210	.988	.984	.034	.025	101.59***	<.001	.011

Abbreviations: CFA, confirmatory factor analysis; CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker-Lewis index.

\*\* $p < .01$ ; \*\*\*  $p < .001$ , two-tailed.

## Relation of CSM behaviours to employability indicators

Next, we tested the incrementals validity of specific CSM behaviour dimensions for specific employability indicators. As can be seen in Table 5, human capital development CSM behaviour explained incremental variance in occupational expertise ( $\beta = .20, p = .02, \Delta R^2 = .03, 95\% \text{ CI} = [.001, .09]$ ), supporting Hypothesis 2a. Building contacts CSM behaviour explained incremental variance in breadth of internal networks ( $\beta = .19, p = .03, \Delta R^2 = .02, \text{ CI} = [.001, .08]$ ), and external networks ( $\beta = .23, p = .01, \Delta R^2 = .03, \text{ CI} = [.001, .09]$ ), supporting Hypothesis 2b. Goal setting and planning CSM behaviour explained incremental variance in career goal clarity ( $\beta = .18, p = .01, \Delta R^2 = .02, \text{ CI} = [.001, .08]$ ), supporting Hypothesis 2c. Mobility-oriented CSM behaviour explained incremental variance in job market knowledge ( $\beta = .12, p = .01, \Delta R^2 = .01, \text{ CI} = [.001, .05]$ ), supporting Hypothesis 2d. Mobility-oriented CSM behaviour explained incremental variance in job offers ( $\beta = .08, p < .01, \Delta R^2 = .04, \text{ CI} = [.001, .10]$ ), supporting Hypothesis 2e. Notably, the general dimension was also a significant predictor of all outcomes ( $\beta$  ranging from .15 to .41, all  $p < .001$ ) and accounted for a larger proportion of variance compared to the hypothesized specific behaviours for all outcomes except occupational expertise ( $\Delta R^2$  ranging from .03 to .17). The exclusion of controls did not change the pattern of results.

## Discussion study 2

Overall, the findings of Study 2 supported the validity of the CSM behaviour measure and confirmed the integrative framework of seven key CSM behaviours developed in Study 1. Moreover, as hypothesized, both the general and specific dimensions were found to be distinct aspects of CSM behaviour, with a bifactor model fitting the data significantly better than alternative models. The general factor accounted for about half of the true variance in item indicators, while each dimension explained distinct variance in the indicators not captured by the general factor. Moreover, we found that specific and general dimensions of CSM behaviour are not only structurally distinct, but different CSM behaviours have incremental validity for predicting various facets of employability. The findings indicate that the general dimension was the most important predictor for facets of employability.

## GENERAL DISCUSSION

### Theoretical implications

Despite the increased interest in career self-management, research on the topic is hindered by the lack of conceptual clarity and an integrative understanding of the various CSM behaviours. To advance these issues, we clarified the CSM concept, identified seven key CSM behaviours and developed a new measure to assess these behaviours comprehensively, examined the relation of these behaviours to the general construct, and showed that specific behaviours uniquely relate to facets of employability. As such, the current paper makes several contributions to research that has sought to identify which CSM behaviours employees use and how these behaviours relate to career outcomes (e.g., Gould & Penley, 1984; Sturges et al., 2002). The definition of CSM based on a set of core attributes provides a clearer basis for differentiating the CSM construct from related constructs, thereby resolving outstanding issues of construct contamination and deficiency. While generally consistent with prior definitions of CSM, our definition is more precise in some respects: Whereas prior definitions define CSM in relation to “career goals” (e.g., Greenhaus et al., 2019) or the improvement of “career circumstances” (e.g., Jiang et al., 2023) we defined the aim of CSM as enhancing work-related experiences in the mid-to long-term within and outside of organizational contexts. The specificity of the time and place distinguishes CSM more clearly

TABLE 5 Latent regression results for predicting consequences of career self-management behaviours.

Predictor	Occupational expertise			Breadth of internal networks			Breadth of external networks			Career goal clarity			Job market knowledge			Job offers		
	<i>b</i>	<i>p</i> -value	$\Delta R^2$	<i>b</i>	<i>p</i> -value	$\Delta R^2$	<i>b</i>	<i>p</i> -value	$\Delta R^2$	<i>b</i>	<i>p</i> -value	$\Delta R^2$	<i>b</i>	<i>p</i> -value	$\Delta R^2$	<i>b</i>	<i>p</i> -value	$\Delta R^2$
Impression management	-.05	.555	.00	-.03	.709	.00	-.03	.718	.00	-.17	.049	.02	-.12	.173	.01	-.04*	.033	.02
Building social contacts	.11	.217	.01	<b>.19*</b>	.030	.02	<b>.23*</b>	.009	.03	.12	.151	.01	.19*	.014	.02	.04	.142	.01
Using social contacts	.04	.675	.00	.13	.124	.01	.16	.057	.02	.05	.585	.00	.12	.118	.01	.02	.302	.00
Human capital development	<b>.20*</b>	.020	.03	.1	.174	.01	.04	.593	.00	.03	.686	.00	.09	.267	.01	.03	.225	.01
Goal setting and planning	-.05	.545	.00	-.04	.647	.00	.03	.741	.00	<b>.18*</b>	.013	.02	.07	.292	.00	-.01	.540	.00
Self-exploration	-.01	.898	.00	0	.982	.00	.01	.836	.00	.02	.736	.00	.05	.524	.00	-.02	.264	.00
Mobility-oriented behaviour	0	.959	.00	-.07	.225	.00	-.03	.562	.00	-.18***	.001	.03	<b>.12*</b>	.024	.01	<b>.08***</b>	<.001	.04
General dimension	.17***	.004	.03	.27***	<.001	.07	.37***	<.001	.13	.41***	<.001	.17	.39***	<.001	.16	.15***	<.001	.12
Age	.16*	.011	.02	.02	.752	.00	.05	.386	.00	-.02	.666	.00	.06	.291	.00	.04	.116	.01
Gender	.17***	.002	.03	-.01	.828	.00	.03	.526	.00	.11*	.024	.01	.09	.077	.01	.01	.575	.00
Organizational tenure	.03	.601	.00	.19***	<.001	.03	.12*	.022	.01	.04	.426	.00	-.03	.507	.0	-.07***	.001	.02
$\Delta R^2$ total			.16			.21			.29		.29		.30		.30			.23

Note: *N* = 536 (Sample 1). All reported regression coefficients are standardized. Regression coefficients for hypothesized relations are printed in bold.  $\Delta R^2$  calculated using procedure described by Hayes (2012).

Gender, 0 = female, 1 = male.

\**p* < .05; \*\*\**p* < .001, two-tailed.

from related constructs such as recovery activities (Sonnetag et al., 2022), which are focused on more short-term, or job crafting, which take place only inside a specified job (Bruning & Campion, 2018).

Building upon the conceptual clarification of CSM, in Study 1, we conducted a systematic literature review to gather a representative list of CSM behaviours studied in the literature and, through thematic analysis (Braun & Clarke, 2006) of this list, integrated these behaviours into a framework consisting of seven key CSM behaviours that are central to CSM and relevant across the lifespan. Results from our scale development process in Study 2 further confirmed and replicated the structural validity of the seven behaviours across two samples and provided evidence that these behaviours can be largely discriminated from the behaviours assessed in other CSM behaviour measures. As such, the framework presented in this study extends and integrates previous frameworks of CSM that did not clearly define CSM and/or unsystematically sampled behaviours, which can lead to issues of construct contamination and deficiency (e.g., King, 2004; Strauss et al., 2012).

Furthermore, Study 2 supported the validity of the new multidimensional measure of CSM behaviour that aligns with the proposed integrative framework. The measure possesses structural validity with reliable measurement of the behaviours and can be largely discriminated from job crafting and prior measures of CSM. Furthermore, the scale explained additional variance in career satisfaction and person-job fit over and above job crafting and prior measures of CSM behaviour. Taken together, the evidence provided in this paper lends significant support to the validity of the newly developed CSM behaviour measure.

Aside from identifying and measuring key behaviours, we clarified the relation of these behaviours to the general construct of CSM. As we have shown, CSM is best represented by a bifactor model with a general dimension, which represents the overall engagement across the spectrum of possible CSM behaviours, irrespective of engaging in any specific behaviour, and seven specific behaviours that capture distinct aspects of CSM that are not accounted for by this general tendency. The distinction between general and specific levels of the construct was further corroborated by the fact that each of the examined facets of employability was significantly predicted by the general dimension and at least one specific behaviour. The bifactor approach supplements previous studies which have examined specific CSM behaviours in isolation or, when employing a multidimensional approach, used a correlated factors model (e.g., Francis-Smythe et al., 2013) or a second-order factor model (e.g., Strauss et al., 2012). The bifactor model has several advantages over these: First, the bifactor approach matches the conceptualization of CSM as being embedded at a deeper level, represented by the general dimension, while specific behaviours are distinct and have unique nomological nets. Second, because it separates common and unique variances more stringently, the bifactor approach provides a clearer picture of the extent to which general and specific dimensions are important for career outcomes (Bornovalova et al., 2020). Third, compared to studying behaviours in isolation, it reduces the risk of omitted-variable bias, which occurs when an effect is erroneously attributed to a specific CSM behaviour while the true effect is caused by a different CSM behaviour or the general dimension of CSM behaviour. The bifactor model is, therefore, more suited to disentangle to which extent general and specific aspects of CSM behaviour are important for outcomes. We therefore also suggest that future research should include the three items that assess the general engagement in CSM when using our measure to capitalize on the benefits of a bifactor model.

The dimensions of our model are aligned with key elements in major career development models, such as the intelligent career framework (Arthur et al., 1995; Defillippi & Arthur, 1994), the movement capital framework (Forrier et al., 2015), and the career resources framework (Hirschi et al., 2018), which describe capitals, resources, or competencies that are important for career success and employability. In our study, we have focused on the movement capital framework, in which these capitals, resources, or competencies are facets of employability that can be maintained and enhanced through activities such as CSM (Forrier & Sels, 2003). Our examination of the role of specific CSM behaviours in predicting distinct facets of employability makes several theoretical contributions to the literature. First, we extend previous conceptualizations of CSM that have related CSM only at a general level to broader outcomes such as career success but did not specify which specific CSM behaviours are related to specific

outcomes (e.g., King, 2004; Seibert et al., 2001). Second, by using a bifactor model, we showed that the general and specific dimensions of CSM behaviour are relevant in predicting career consequences such as facets of employability. In general, the findings suggest that the general dimension is more important in predicting employability outcomes than the specific behaviours, while specific behaviours also accounted for additional variance in the facets of employability linked to their content domains. We thereby extend previous studies that have focused either on the general level of CSM or specific CSM behaviours but did not jointly consider the relative roles of general and specific dimensions of CSM behaviour. Third, we contribute to the employability literature by clarifying how CSM behaviours are linked to central facets of employability. Specifically, this extends the movement capital framework, which has acknowledged the role that CSM may play in maintaining and enhancing employability (Forrier et al., 2015) but did not examine which behavioural processes may underlie these links. Hence, our examination of the role of CSM behaviours in predicting movement capital enables a better understanding of how persons develop and enact their employability through behavioural processes.

## Practical implications

The study has several implications for practice. For career counselling, it may be helpful to examine the multiple dimensions of CSM behaviour to understand to what extent their clients are engaged in CSM in its general and specific forms. The measure developed for Study 2 provides a validated measure of CSM behaviour that could be used in career assessment. The measure could also be used as a diagnostic tool in organizational career management, for example, to profile the degree to which employees are engaged in CSM behaviours that make them internally employable.

Because employability is one of the central concerns of career counselling (Lent, 2013), counsellors should be aware that both specific behaviours and the general dimension of CSM behaviours are linked to the facets of employability. Practitioners will need to decide to what extent they focus on promoting CSM at a general level and to what extent they focus on promoting individual behaviours. The promotion of CSM at a general level may be achieved by focusing on behaviours more closely linked to the general level, such as goal setting and planning, and is likely to help develop employability resources overall. Promoting individual behaviours is likely to help develop specific employability resources, and practitioners may draw on interventions tailored to these behaviours, such as networking (e.g., Spurk et al., 2015). For example, if clients lack the social capital to implement their career goals, they may be guided to build contacts to establish their network.

For organizational career management, it might be helpful to consider CSM behaviours, the requirements of jobs or career tracks, and the employability resources of employees jointly to improve talent management. As a first step, career track requirements could be defined (e.g., social capital in managerial positions). Second, HR could assess employees' CSM behaviours and employability resources to identify how well they fit available career tracks. In a third step, HR could tailor interventions that promote CSM behaviours to achieve a better person-environment fit in terms of employees' employability resources and career track requirements. Doing so could create a synergy in which individuals' CSM behaviours, guided through organizational career management practices, achieve improved outcomes for both the employee and the organization. For the employee, the joint consideration of CSM behaviours, career requirements, and employability resources might lead to a better person-environment fit within their current organization, while the organization may profit from higher performance and lower turnover.

## Study limitations and future research

The two studies have some limitations that should be addressed. First, we limited our samples to employees because they make up the largest share of the labour market. While the CSM behaviours we identified as key behaviours are relevant to other populations (e.g., self-employed, unemployed, gig

workers), our measurement of the dimensions and findings regarding the relation of CSM behaviours to facets of employability may not generalize to these populations. While our item formulations aimed to be as broad as possible (e.g., by not referring specifically to co-workers or supervisors), they may not fully capture the behaviours relevant to all populations. For instance, self-employed and temporary agency workers engage in mobility-oriented behaviour by seeking hybrid forms of self-employment and employment by an organization (Retkowsky et al., 2023; van den Groenendaal et al., 2022), which our measure may not capture fully. Future research could analyse how CSM behaviours need to be differently assessed in these populations and how their levels of CSM behaviours differ from those of other populations.

Relatedly, our samples were from Germany and may not generalize to other countries and cultures. Research suggests that the link of CSM to career success is moderated by contextual differences at the macro level, such as national culture (Smale et al., 2019). Hence, future studies should investigate to which extent contextual variables are linked to levels of CSM behaviours and how contextual variables act as boundary conditions in the relation of CSM behaviours to facets of employability.

Second, our findings regarding the relation of CSM behaviours to facets of employability were drawn from self-reported, time-lagged data, limiting the causal interpretation of the findings. More rigorous longitudinal analyses are needed to replicate these findings. Moreover, our findings pertain to the between-person differences in CSM behaviours and facets of employability. Future research should study how within-person changes in CSM behaviours relate to changes in these facets of employability. Studies could also collect data from multiple sources, for example, drawing on the supervisor's evaluation of job and organizational outcomes of CSM behaviours.

Third, we focused our analysis of the consequences of CSM behaviours on facets of employability. While employability as a central career construct with multiple dimensions matched our framework well, future studies should also investigate other types of outcomes. We consider other multidimensional constructs in the organizational and career field promising, such as multidimensional conceptualizations of career success (Shockley et al., 2016). For further studies of the nomological net, research should consider which antecedents, correlates, and outcomes relate to the general dimension of CSM and which are uniquely related to specific CSM behaviours.

Finally, future research should also explore the relevance of the behaviours for which we have not theorized or obtained specific associations. We believe that examination of boundary conditions and within-person studies are needed for this aim. For example, while impression management was largely unrelated to facets of employability, studies suggest that the effectiveness of impression management may depend on boundary conditions, such as social skills (Harris et al., 2007). Moreover, disentangling the between-person and within-person levels of CSM behaviours may extend our understanding of CSM behaviours that are ambiguously related to career outcomes. We did not posit any hypotheses regarding self-exploration and using social contacts given their ambiguous characteristics. Self-exploration may lead to higher self-awareness but may also stem from a lack of such self-awareness. Using social contacts may lead to better outcomes through social support processes but may also stem from a need for feedback and support. Empirically, we found no significant relation of self-exploration and using social contacts with facets of employability. Within-person studies may help us better understand these behaviours' role by avoiding confounding variables and showing the relevance of these more ambiguous CSM behaviours in the process of CSM.

## CONCLUSION

Based on theoretical considerations of CSM, we clarified the concept, dimensionality, and structure of CSM behaviour and examined how CSM behaviours relate to different facets of employability. The article shows that CSM behaviour should be understood as a multidimensional construct encompassing a general and seven specific dimensions. CSM behaviours relate to facets of employability in distinct ways, with the general dimension relating to all examined facets of employability and specific dimensions of CSM behaviour uniquely relating to specific facets of employability. Altogether, we are confident

that our study provides a deeper understanding of how employees manage their careers and moves the field towards a more nuanced understanding of the multidimensional nature of CSM behaviour and its consequences.

## AUTHOR CONTRIBUTIONS

**Francisco Wilhelm:** Conceptualization; investigation; writing – original draft; methodology; visualization; writing – review and editing; software; formal analysis; project administration; data curation. **Andreas Hirschi:** Supervision; conceptualization; methodology; validation; resources; project administration; writing – review and editing; funding acquisition. **Dawa Schlöpfer:** Validation; formal analysis; investigation.

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## CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## DATA AVAILABILITY STATEMENT

Data and analysis code are available upon request.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

### Table S1

**How to cite this article:** Wilhelm, F., Hirschi, A., & Schläpfer, D. (2024). The multidimensional nature of career self-management behaviours and their relation to facets of employability. *Journal of Occupational and Organizational Psychology*, 97, 342–375. <https://doi.org/10.1111/joop.12474>

## APPENDIX A

### Measurement development

#### A.1 | STEP 1: ITEM DEVELOPMENT

We generated items using a deductive approach based on our definitions of key behaviours and existing items. Based on the literature review in Study 1, we collected 562 items across 44 scales of existing measures of CSM behaviours. We then reviewed and identified existing items that match our key behaviours. Second, the first and third authors developed new items based on the conceptual definitions of key behaviours derived in Study 1, adapting existing items where possible. In developing items, we followed best practices in item writing by keeping items simple, context-independent and avoiding double-barrelled formulation (Hinkin, 1998). Using this method, we generated between 9 and 29 items per dimension. Third, we jointly discussed these items among all authors to identify the items that best reflected the dimensions' content domains while covering each dimension's breadth and checked that all items concord to best practices in item writing. The resulting item pool consisted of 57 items with 4–10 items per dimension, depending on the breadth of the dimension and the extent to which adapted items from validated scales could be used. In line with previous measures of CSM behaviour (e.g., Hirschi et al., 2013), we used a frequency format with the instruction being “To what extent have you done the following during the last six months” and the response format being a 5-point Likert scale from 1 (*never*) to 5 (*a great deal*).

#### A.2 | STEP 2: CONFIRMING FACTOR STRUCTURE, ITEM REDUCTION, AND REPLICATION IN AN INDEPENDENT SAMPLE

To confirm the factorial structure and to determine the final set of items, we conducted item analyses and a series of confirmatory factor analyses (CFAs) with Sample 1 from Study 2 of the main manuscript using the R package *lavaan* (Rosseel, 2012). First, we analysed inter-item correlations, item means, standard deviations, skewness and kurtosis to ensure that all items meet quality standards (Clark & Watson, 1995). We removed one item with a very high kurtosis ( $>2$ ) and low mean ( $M=1.57$ ).

Second, we used CFA to confirm the hypothesized seven-factor structure developed in Study 1, with each of the 56 items loading onto their specified factor. We analysed the fit of this model using  $\chi^2/df$ , comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR). These indices indicated that fit was sub-optimal (see Table A1), with some criteria achieving good fit (RMSEA  $<.06$ ,  $\chi^2/df < 3$ , SRMR  $<.09$ ) but others not (CFI and TLI  $<.95$ ) according to established cut-offs (Hu & Bentler, 1999). All item loadings

TABLE A1 Results of CFA.

Model	$\chi^2$	df	CFI	TLI	RMSEA	SRMR	$\Delta\chi^2$	$\Delta CFI$
Confirming structure								
Hypothesized 7-factor structure	3437.23***	1463	.906	.901	.056	.059		
6-factor structure 1	4216.67***	1469	.868	.862	.066	.061	509.31***	-.037
6-factor structure 2	4309.08***	1469	.864	.857	.068	.063	496.29***	-.042
6-factor structure 3	4184.79***	1469	.870	.864	.066	.068	959.42***	-.076
5-factor structure 1	5025.04***	1474	.829	.822	.075	.066	1122.99***	-.090
5-factor structure 2	5317.09***	1474	.815	.807	.079	.075	502.25***	-.036
Item reduction								
Sample 1	267.22***	168	.985	.981	.037	.032		
Sample 2	292.37***	168	.983	.978	.040	.042		

Note: Sample 1 N=536, Sample 2N=529. 6-factor structure 1: collapsed building and using contacts; 6-factor structure 2: collapsed using contacts and impression management; 6-factor structure 3: collapsed goal development and self-exploration; 5-factor structure 1: collapsed building contacts, using contacts, and impression management; 5-factor structure 2: collapsed human capital development, goal setting, and self-exploration.

Abbreviations: CFA, confirmatory factor analysis; CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker-Lewis index.

\*\*\* $p < .001$ , two-tailed.

on their respective factors were  $>.65$ . We also compared the hypothesized model with alternative models in which some factors were combined. The hypothesized model outperformed all alternative models with significant  $\chi^2$  difference test for nested model comparisons and  $\Delta CFI$  values exceeding established cut-offs of  $\Delta CFI > .002$  (Meade et al., 2008). In sum, the analyses supported our model but indicated that some items should be eliminated.

Third, to further improve fit and reduce scale length, we selected 3 items per scale based on factor loadings on target factor, modification indices for cross-loadings, item coverage (i.e., whether the items jointly cover the meaning of the construct definition) and item redundancy (i.e., ensuring items are not redundant in content or have similar wording). We then evaluated this model, which showed good fit to the data in terms of various fit indices (see Table A1). All item loadings were  $>.68$ , and all dimensions were measured reliably with Cronbach's Alpha  $>.75$ .

Fourth, to replicate the factor structure in an independent sample we used Sample 2 from Study 2 of the main manuscript. We conducted a CFA with the same hypothesized model as in Sample 1, which again showed good fit to the data (see Table A1); all item loadings were  $>.62$ , and all dimensions were measured reliably with Cronbach's Alpha  $>.74$ . A list of final items and their factor loadings in Sample 2 is given in Table A2.

### A.3 | STEP 3: DISCRIMINANT AND CONVERGENT VALIDITY WITH RELATED CONSTRUCTS AND MEASURES

To test discriminant and convergent validity with related constructs and extant measures of CSM behaviour, we examined the measure's relation to job crafting and prior uni- and multidimensional measures of CSM behaviour. We expected these constructs and measures to relate positively to the CSM behaviour measure while not being so highly correlated as to be redundant (Rönkkö & Cho, 2022). Specifically, we hypothesized that the CSM behaviour measure correlates positively with (a) job crafting, (b) the proactive career behaviour measure by Strauss et al. (2012), (c) the career self-management measure by Sturges et al. (2002), (d) the Career Engagement Scale (Hirschi et al., 2013). Regarding discriminant validity, we hypothesized that CSM behaviour measure can be discriminated from (a) job crafting, (b) proactive career behaviour measure by Strauss et al. (2012), (c) career self-management measure by Sturges et

TABLE A2 Final items and their loadings in standard and bifactor-(S-1) CFA models in sample 2.

Item	Standard CFA loadings	S-factor loadings	G-factor loadings	Consistency	Specificity
<b>Impression management</b>					
Tried to convey a positive image of myself to others at work	.63	.53	.39	.36	.64
Made others aware of my talents, qualifications, and accomplishments	.78	.46	.58	.62	.38
Complimented others for their achievements to create a positive impression	.69	.61	.42	.32	.68
<b>Building social contacts</b>					
Spent a lot of time building contacts to others in my professional environment	.77	.49	.59	.59	.41
Maintained contact with persons who are important for my career development	.87	.63	.59	.47	.53
Cultivated contacts to people who hold influential positions in my professional environment	.84	.67	.54	.39	.61
<b>Using social contacts</b>					
Used my professional network to advance professionally	.83	.49	.67	.65	.35
Sought feedback from others on things that could help my career	.85	.52	.68	.63	.37
Asked contacts for tips and advice on my career	.88	.52	.70	.64	.36
<b>Human capital development</b>					
Continually developed my work-related skills	.86	.58	.64	.54	.46
Developed expertise, knowledge and skills in areas that are important for my career	.91	.62	.68	.55	.45
Expanded my work tasks so that I can develop professionally	.84	.53	.65	.60	.40
<b>Career goal setting and planning</b>					
Set clear goals for what I want to achieve in my career	.85	.46	.72	.71	.29
Developed career goals that are attractive to me	.92	.60	.73	.60	.40
Carefully planned what I need to do to achieve my career goals	.88	.46	.74	.72	.28
<b>Self-exploration</b>					
Reflected on my own strengths and abilities	.74	.42	.59	.67	.33
Thought about what is important to me in my career	.89	.67	.62	.47	.53
Reflected about what kinds of work I enjoy doing	.79	.60	.53	.44	.56

TABLE A 2 (Continued)

Item	Standard CFA loadings	S-factor loadings	G-factor loadings	Consistency	Specificity
Mobility-oriented behaviour					
Obtained information regarding specific jobs or companies	.87	.52	.71	.65	.35
Informed myself about employment opportunities on the job market	.94	.72	.60	.41	.59
Made inquiries about getting a job	.90	.71	.57	.39	.61
General engagement					
Actively sought to shape my professional future	–	–	.90	–	–
Undertook things to realize my career goals	–	–	.93	–	–
Took care of the development of my career	–	–	.91	–	–

Note: N = 529 (Sample 2). All reported factor loadings are standardized. Consistency is the proportion of true (non-error) variance of the indicator that is determined by the G-factor. Specificity is the proportion of true (non-error) variance of the indicator that is determined by its S-factor. As a lead-in, participants were asked “To what extent have you done the following during the last six months:”. Response format was a 5-point Likert scale (1 = *never* to 5 = *a great deal*). All factor loadings significant at  $p < .01$ .

Abbreviation: CFA, confirmatory factor analysis.

al. (2002), (d) Career Engagement Scale (Hirschi et al., 2013). We chose these scales as they are highly cited in the literature, have documented evidence of their validity, and show conceptual overlap with our own CSM behaviour framework in terms of the behaviours they include.

## Methods

### A.3.1.1. | Sample

The same two samples as described in Study 2 of the main study were used.

### A.3.1.2. | Measures

Unless noted otherwise, respondents were asked to indicate to what extent they agreed to the given statements, using a 5-point Likert-type scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*).

*Job crafting:* We measured job crafting at T1 using 15 items from the Job Crafting Scale (Tims et al., 2012). We used three of four subscales: Increasing Structural Job Resources (Cronbach's alpha = .82), Increasing Social Job Resources (Cronbach's alpha = .85), and Increasing Challenging Job Demands (Cronbach's alpha = .87). Items were answered using a 5-point Likert-type scale from 1 (*never*) to 5 (*often*). A sample item is "I try to develop my capabilities."

*Strauss Proactive Career Behaviour Scale:* As a first multidimensional CSM behaviour scale, we administered a 12-item scale from Strauss et al. (2012) at T1, consisting of four subscales with three items each: Career Planning (Cronbach's alpha = .94), Proactive Skill Development (Cronbach's alpha = .88), Career Consultation (Cronbach's alpha = .87), and Network Building (Cronbach's alpha = .91). A sample item is "I am planning what I want to do in the next few years of my career."

*Sturges CSM behaviour Scale:* As a first second multidimensional CSM behaviour scale, we administered an 11-item scale from Sturges et al. (2002) at T1, consisting of three subscales: seven items measuring networking behaviour (Cronbach's alpha = .89), two items measuring visibility behaviour (Cronbach's alpha = .78), and two items measuring mobility behaviour (Cronbach's alpha = .90). A sample item is "I have got myself introduced to people who can influence my career."

*Career Engagement Scale:* As a unidimensional CSM behaviour scale, we assessed the 9-item Career Engagement scale (Hirschi et al., 2013) at T1. Participants were asked to what extent they had engaged in the listed behaviours in the past 6 months. Items were answered using a 5-point Likert-type scale from 1 (*not much*) to 5 (*a great deal*). A sample item is "Cared for the development of your career." Cronbach's alpha was .94.

*Career satisfaction:* We measured career satisfaction at T2 using the 3-item satisfaction subscale from the Subjective Career Success Inventory (Shockley et al., 2016). The respondents were asked to indicate the extent to which the statements apply to their career overall on a 5-point Likert-type scale from 1 (*does not apply at all*) to 5 (*fully applies*). Cronbach's alpha was .90.

*Person-Job Fit:* We measured person-job fit at T2 using a 4-item scale from Saks and Ashforth (2002). Participants were asked to rate the items on a 5-point Likert-type scale from 1 (*to a very small extent*) to 5 (*to a very large extent*). A sample item is "To what extent do your knowledge, skills, and abilities match the requirements of the job?" Cronbach's alpha was .90.

### A.3.1.3. | Data analyses

To evaluate convergent validity with related constructs and extant measures of CSM, we analysed multiple structural equation models. We created separate models for each related construct, modelling the factor structure of our CSM behaviour measure and the factor structure of the correlate construct, with each item loading onto their specified factor. All factors were allowed to correlate with each other. We then inspected the latent correlations of the dimensions of our CSM measure with the dimensions of the correlate to test our hypotheses.

To evaluate the discriminant validity of our newly developed CSM behaviour measure, we compared it with the related constructs using two established procedures. In the first procedure, we used the Fornell-Larcker criterion (Fornell & Larcker, 1981). This criterion suggests that discriminant validity is given when the squared latent correlation between the compared constructs is smaller than the average variance extracted of the items by their constructs. Because the Fornell-Larcker criterion is a dichotomous evaluation, we employed a second procedure that uses a graded approach to indicate the degree of

discriminant validity problems (Rönkkö & Cho, 2022). This procedure uses the upper limit of the 95% confidence interval (CI) of the latent correlation between constructs to assess discriminant validity. If the upper limit (UL) of the 95% CI is lower than .80 'no problem' is indicated; if it falls between .80 and .90 a 'marginal problem' is indicated; if it falls between .90 and 1 a 'moderate problem' is indicated; if it is 1 a 'severe problem' is indicated. In both procedures, the same factor models were used as in the analyses of convergent validity.

All SEM analyses were conducted using robust ML estimation with the R package *lavaan* (Rosseel, 2012). To deal with missing data because of the time-lagged analyses, we used Full Information Maximum Likelihood.

## Results

We anticipated the new CSM measure to show convergent validity with extant constructs and measures. In line with this hypothesis, all tested correlations were positive and significant. For job crafting and its dimensions, correlations ranged from  $r = .28$  (mobility-oriented behaviour with structural crafting) to  $.73$  (using contacts with social crafting). For the proactive career behaviour measure by Strauss et al. (2012) and its dimensions, correlations ranged from  $r = .36$  (mobility-oriented behaviour with skill development) to  $r = .73$  (use contacts with consultation). For the CSM behaviour scale by Sturges et al. (2002), correlations ranged from  $r = .31$  (human capital development with mobility behaviour) to  $r = .80$  (using contacts with networking). For the Career Engagement Scale, correlations ranged from  $r = .58$  (impression management) to  $r = .81$  (goal setting and planning). Overall, this suggests that the CSM behaviours assessed in the newly developed scale are positively related with the behaviours assessed in prior CSM and job crafting scales, providing evidence of the convergent validity of the scale.

Furthermore, we anticipated our measure not to be redundant with prior measures of CSM and job crafting. In all Fornell-Larcker tests, the average variance extracted (AVE) of the CSM dimensions was above .50 (.51–.81), and AVE values exceeded the squared latent correlation of the dimensions with the related constructs (squared correlations ranged between .03 and .64), indicating that the Fornell-Larcker criterion was met in all tests. Next, we applied the guidelines for a more graded assessment of discriminant validity (Rönkkö & Cho, 2022). Out of the 77 comparisons between the focal CSM scale dimensions and the dimensions of the other constructs, all except 6 comparisons indicated no problem of redundancy as given by the decision rule (95% UL of CI of the latent correlation  $< .80$ ). The other 6 comparisons indicated 'marginal problems' regarding redundancy according to the decision rule ( $.80 \leq \text{UL} \leq .90$ ). Building contacts was highly related to the networking dimension of the CSM scale by Sturges ( $r = .79$ ; CI = [.73, .85]). Using social contacts was highly related to the networking dimension of the CSM scale by Sturges ( $r = .80$ ; CI = [.75, .86]) and the crafting social resources dimension of job crafting ( $r = .73$  CI = [.66, .80]). These relations are in line with our classification of these behaviours in Study 1, indicating that these scale dimensions share similar content domains. Furthermore, building contacts ( $r = .75$ ; CI = [.69, .81]), using contacts ( $r = .76$ ; CI = [.70, .82]), and goal setting ( $r = .81$ ; CI = [.76, .86]) overlapped with the unidimensional CSM behaviour scale. This indicates that these behaviours are highly related to the general extent of engagement in CSM behaviour. Overall, discriminant validity findings indicated that our newly developed scale can be largely discriminated from related constructs and prior measures, with a small subset of dimensions showing marginal problems of redundancy.

## A.4 | STEP 4: INCREMENTAL VALIDITY OVER AND ABOVE RELATED CONSTRUCTS AND MEASURES

In addition to ensuring that our CSM measure is not redundant with previous measures of CSM and other related constructs, we examined whether the CSM measure has incremental variance in predicting important career outcomes. Because CSM behaviour has been categorized as a proactive person-environment fit behaviour (Parker & Collins, 2010), we aimed to demonstrate its incremental validity in predicting person-job fit. Third, as theories such as the protean career model (Briscoe et al., 2012) and



TABLE A3 Incremental validity of CSM measure over related constructs and measures.

Comparison	Outcome	$R^2_{\text{Full}}$	$R^2_{\text{Reduced}}$	$\Delta R^2$ (95% CI)	$\Delta R^2$ SE	p-value
Job crafting	Career satisfaction	.266	.237	.029 [.016, .072]	.014*	.023
Job crafting	Person-job fit	.187	.129	.057 [.037, .101]	.017***	<.001
Strauss PCB	Career satisfaction	.176	.131	.045 [.024, .101]	.020*	.021
Strauss PCB	Person-job fit	.116	.056	.060 [.039, .109]	.018***	<.001
Sturges CSM	Career satisfaction	.190	.149	.041 [.023, .092]	.018**	.002
Sturges CSM	Person-job fit	.119	.064	.055 [.034, .101]	.017**	.001
Career engagement	Career satisfaction	.153	.082	.071 [.044, .134]	.023*	.045
Career engagement	Person-job fit	.100	.018	.082 [.054, .137]	.021***	<.001

Note:  $N = 371$ – $536$  (missing values at T2 were handled using FIML). R-squared changes were calculated using the method proposed by Hayes (2021) with bootstrapped standard errors ( $k = 2000$  bootstraps).  $\Delta R^2$  indicates the difference in  $R^2$  between  $R^2$  of models that only include the comparison scale and control variables (that is,  $R^2_{\text{Reduced}}$ ) and  $R^2$  of models that include the comparison scale, the CSM behaviour scale, and control variables (that is,  $R^2_{\text{Full}}$ ). \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Abbreviations: CSM, career self-Management; PCB, proactive career behaviour.

social cognitive career theory (Lent & Brown, 2013) hypothesize that agentic behaviours relate to career success, CSM should predict incremental variance in career satisfaction. We therefore hypothesized that the CSM measure has incremental variance in predicting (a) person-job fit and (b) career satisfaction over job crafting and prior CSM measures.

We estimated the incremental validity of CSM behaviours over related constructs and measures using a SEM-based method proposed by Hayes (2021). We used this procedure instead of hierarchical multiple regressions to be able to account for missing data at T2 using FIML, in line with best-practice recommendations (Newman, 2014). To do so, we first created full models in which we regressed each outcome variable (i.e., career satisfaction and person-job fit) separately onto the seven key CSM behaviours and the dimensions of the respective comparison construct. Moreover, like in the main manuscript, we added gender, age, and organizational tenure as control variables, as they are known to be related to CSM behaviour and the outcome variables (Bolino et al., 2016; Forret & Dougherty, 2004; Kooij, 2015; Slaughter et al., 2007). Second, we estimated reduced models in which the CSM behaviour variables are omitted. We then proceeded to estimate the incremental variance explained by the CSM behaviour measure by examining  $\Delta R^2$  and its associated p-value derived from bootstrapped standard errors ( $k = 1000$  bootstraps).

Results showed full support for the hypothesis regarding incremental validity. As indicated by  $\Delta R^2$ , the newly developed CSM behaviour scale accounted for additional variance in person-job fit and career satisfaction over and above control variables, job crafting, and the three examined prior measures of CSM behaviour (see Table A3). Omission of control variables did not alter the pattern of results.

## A.5 | ADDITIONAL ANALYSES OF MEASUREMENT INVARIANCE

We also conducted measurement invariance tests to examine if the scale's factor structure differs or if items function differently across different groups based on age, gender, and organizational tenure. To do so, we used two approaches: global CFA tests of configural, metric and scalar invariance for all three grouping variables and an item-focused tree approach (Guo et al., 2023) of differential item functioning (DIF) with the continuous grouping variable age and organizational tenure. For these measurement invariance tests, we used Sample 2.

For the global CFA tests, age (18–35 years, 36–49 years, and 50+ years) and organizational tenure (1–7 years, 8–15 years, and 16+ years) were divided into three categories, while gender used the two non-transformed response categories (male vs. female). The fit of the configural model was excellent across the three age groups (CFI = .97, TLI = .97, and RMSEA = .05), across the two gender

groups (CFI = .99, TLI = .99, and RMSEA = .03), and across the three organizational tenure groups (CFI = .97, TLI = .97, and RMSEA = .05). This supports that the factorial structure of the measure does not differ between the assessed groups. The metric model set the factor loadings to be equal across groups. This fit was also excellent for all three group variables (all CFI  $\geq$  .97, TLI  $\geq$  .97, and RMSEA  $\geq$  .05) and there was no significant difference in model fit of configural and metric models for any of the comparisons (all  $\Delta\chi^2 \leq 28.16$ ,  $p \geq .45$ ). This indicates that there are no meaningful differences in how the items relate to their respective factors across the examined groups. Finally, scalar invariance was examined by placing restrictions on all item intercepts to be equal. The scalar model fit was also excellent for three group variables of age, gender, and organizational (all CFI  $\geq$  .97, TLI  $\geq$  .97, and RMSEA  $\geq$  .05). For organizational tenure, there was no significant difference in model fit comparing scalar invariance model to the metric model ( $\Delta\chi^2 = 40.39$ ,  $df = 28$ ,  $p = .06$ ,  $\Delta CFI = .002$ ), but model fit was significantly worse for age ( $\Delta\chi^2 = 65.60$ ,  $df = 28$ ,  $p < .001$ ;  $\Delta CFI = .005$ ), and gender ( $\Delta\chi^2 = 30.35$ ,  $df = 14$ ,  $p < .01$ ,  $\Delta CFI = .002$ ). Thus, scalar invariance of the measurement does not seem hold for age and gender, indicating that employees of different age or gender endorsed some CSM behaviour items differently.

For the item-focused tree (IFT) approach (Guo et al., 2023), we used a logistic regression-based IFT method with dichotomous response variables because the method for polytomous responses usually leads to convergence problems and also failed to converge for all our models. To enable the logistic regression-based IFT, we dichotomized the CSM behaviour items with a lower CSM behaviour response category (1 = “never”, 2 = “not much”) and a higher CSM behaviour response category (3 = “somewhat”, 4 = “much”, 5 = “a great deal”). We chose to combine the response categories in this way as the empirical median for 52.4% of the items was “not much”. Results indicated DIF related to age for two items of the using contacts, one item of the human capital development, and one item of the self-exploration subscales. For all three items, Nagelkerke's Pseudo- $R^2$  values were negligible according to established thresholds (Jodoin & Gierl, 2001): for using contacts items  $R^2 = .017$  and  $R^2 = .015$ , respectively; for the human capital development item  $R^2 = .010$ ; for the self-exploration item  $R^2 = .017$ . All item  $R^2$  were well below the threshold for moderate effects of  $R^2 \geq .035$ . This may indicate that, while statistically significant, DIF regarding age was practically insignificant. For organizational tenure, logistic regression-based IFT failed to converge for the subscales goal setting and planning and self-exploration. For the other five subscales, the IFT models converged and did not identify any DIF, corroborating the results for organizational tenure obtained from global CFA tests of measurement invariance which indicated that individuals with differing organizational tenure did not respond differently to the CSM behaviour items.