



Theorising and conceptualising the sustainability control system for effective sustainability management

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Abstract

This conceptual paper explores the iterative relationship between system design and use for the development process of sustainability control systems (SCS). Building upon Adler and Borys' seminal framework (Adm Sci Q 41(4):61–89, 1996) as an analytical tool, it suggests that SCS are characteristically distinct, and more research into the dual role of control (i.e. *control over* based on system design and *control in situ* based on system use by the individual user) is necessary for future theorisations of the SCS. It poses that for sustainable futures that extend beyond organisational boundaries, more attention is required on individual general employees in management accounting and control frameworks as instrumental for performance outcomes. To this end, individual values, borne from the extra-organisational context, are considered important alongside organisational ones for the development of SCS. Thus, the paper bridges perspectives on system characteristics, the individual and performance outcomes by offering a theoretical framework for future research. It also extends studies on accounting as a social practice by emphasising the extra-organisational factors that influence internal accounting systems. Finally, it expounds upon the notion of social control as an individual-level phenomenon, necessary for sustainability. This expanded theoretical perspective also has implications for practice by encouraging managers to think strategically about how systems are received from the perspective of the user. This can encourage more commitment to the sustainability cause from the outset, as well as over spatial and temporal boundaries.

Keywords Boundary spanners · Enabling formalisation · Management accounting and control · Social control · Sustainability control systems · Sustainability

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1 Introduction

Sustainability control systems (SCS) are often viewed as separate management control systems (MCS) that address social and environmental concerns (Burritt and Saka 2006; Gond et al. 2012). Yet, as a developing academic construction in management accounting and control (MAC) research (see Bebbington and Thomson 2013), a clear definition of the SCS is difficult to find (Lueg and Radlach 2016). While some argue that this is perhaps due to fragmentation in terms of definition, theory and performance outcomes in extant studies (Guenther et al. 2016; Lueg and Radlach 2016), others imply that it is due to the inherently contextual nature of SCS (e.g. Riccaboni and Leone 2010; Qian et al. 2011; Thomson et al. 2014). Arguably, local systems are more important for sustainability given that broader developmental goals, which may be set as organisational strategic targets such as the sustainable development goals (SDGs), constitute an overarching framework, rather than a concrete solution. Relatedly, other scholars highlight the commensuration and technical issues associated with social and environmental control (Lisi 2015; Unerman and Chapman 2014). As a result, studies within the sustainability MAC research stream remain theoretically-scarce and much remains to be known about the emergence and use of SCS within organisations (Guenther et al. 2016).¹

SCS exist at the interface between strategy and operations to meet sustainability performance outcomes in a given locale. Guenther et al. (2016) suggest that SCS embrace elements of both management accounting *and* control by providing information and techniques to improve sustainability performance measures and outcomes over time and space (see also Henri and Journeault 2010). Specifically, management accounting relates to discrete tools such as life-cycle or materiality assessment which incorporate temporality, as well as support decision-making and inform strategy (see Gond et al. 2012). Meanwhile, the SCS constitutes a ‘package’ of these tools (Guenther et al. 2016), positioned “to maintain or alter patterns in organizational activities, specifically concerning the environmental [and social] aspects of organizational performance” (Pondeville et al. 2013, 318). Therefore, SCS both assist strategy *and* influence the practices of organisational actors (Gond et al. 2012). Indeed, the use of the term ‘package’ infers an arrangement of independent controls grouped together, rather than a comprehensive, interdependent system (see Bedford et al. 2016; Malmi and Brown 2008; Grabner and Moers 2013). However, given their highly contextual nature, it therefore becomes of interest to explore the broader nature of control in the development process of SCS, rather than the specific control typologies and their interaction effects.

Understanding the relationship between system design and use is paramount for sustainable performance outcomes that extend over time and space (see e.g. Perego and Hartmann 2009; Ferreira et al. 2010). As sustainability becomes more

¹ Guenther et al. (2016) explicitly refer to the environmental management control system (EMCS) rather than the SCS which also includes social dimensions. However, the concentration on *environmental* systems in MAC research is due to the perception that controlling environmental aspects is easier than social dimensions, both in professional and academic practice (Lueg and Radlach 2016).

integrated into multilevel governance architectures, the organisation is understood as only one part of the sustainable solution (Johnstone 2019). While Spence and Rinaldi (2014) look at the role of sustainability control in the supply chain, most research focuses on the ‘intra-organisational’ design elements of SCS and/or adopts mainstream functionalist frameworks (e.g. Arjaliès and Mundy 2013; Riccaboni and Leone 2010; Rodrigue et al. 2013 Journeault et al. 2016). This inadvertently assumes sustainability performance as an organisational-level phenomenon that is primarily achieved through the design of formalised, bureaucratic systems by managers to control employees for effective outcomes; i.e. a technical approach to control (e.g. Henri and Journeault 2010). However, sustainability is increasingly presented both in research and practice as the responsibility of *everyone*.² Therefore, research attention is also required on the social aspects of control. To this end, the mainstream managerially-orientated models are arguably partial for explaining sustainability phenomena for two, related reasons. First, SCS also require active (re)construction by the general employees from the bottom-up (Johnstone 2018). Second, SCS are highly dynamic due to an array of external legislative disturbances, contingencies or stakeholder pressures that necessitate their continual (re)design (see Pondeville et al. 2013). Such critical perspectives suggest that management control, in its conventional top-down functionalistic sense, requires redressing as sustainability neither begins nor ends at the firm’s borders, and is the responsibility of all.

Recent research suggests that developing the skills and competences of the individual employee is key to affect a sustainable change over time and space (e.g. Johnstone 2018). Nevertheless, little attention has been given to “how management accounting or management control systems may help ... change awareness and attributes towards more social and environmental responsible decision making, taking corporate sustainability beyond the business case” (Albelda 2011, 81; see also Durden 2008). Currently, most empirical studies are based on the strategic level of managers (e.g. Rodrigue et al. 2013). Not only does this assume that managers are *the* sustainability experts, it furthermore neglects the perspectives, expertise and abilities of the general employees at the operational level for sustainable solutions (see Catasús and Cäker 2016). From this, one can assume that general employees are treated as a homogenous group of system components to be controlled. This is echoed in broader MAC research with the notion of cultures or clans in constructions of the MCS (see Malmi and Brown 2008). It is also implicit within extant constructions of socio-ideological control which assume that formalised MCS design is *the* means to guide employee behaviour and achieve operational outcomes (see Bedford and Malmi 2015 for an overview). However, all individuals—whether managers who strategically design SCS from the top or general employees who work

² This point reflects interviews conducted in 2017 with one large Scandinavian bank and one international logistics company. Although this paper is not empirical, it appears from industry discussions that there is a current move towards responsibility (or accountability frameworks) that rests with *everyone*; i.e. every ‘one’ (employee in the firm). This was also reflected in presentations by keynote speakers such as Ian Thomson and Martin Thomas at the Management Accounting Research Group Conference at Aston Business School, Birmingham, UK, November 23–24, 2017 who argued that corporate sustainability necessitates more attention on the individual’s role; i.e. accounting as a social practice.

daily with sustainable operations at the bottom—are essential for not only ‘greening’ the firm, but also for sustainable futures that extend beyond its borders (see Sundin and Brown 2017; Won Kim and Matsumura 2017; Johnstone 2018). Therefore, the integration of local actors’ knowledge becomes paramount to the development process of SCS which have to be flexible enough to absorb local contingencies within a particular regulative or legislative context. Thus, there is the need to reconceptualise the SCS from within the field where the individual employee is key for future theorisations.

Taking the above into consideration, this conceptual paper is motivated by the need to develop conceptualisations and theorisations of the SCS as characteristically distinct from MCS in terms of design and use. It is founded on the premise that conventional MCS frameworks are partial for explaining sustainability phenomena. Particularly, the paper explores the binary functionalist and social-constructivist positions that are implicitly assumed in the emergence and use of SCS for sustainability outcomes over time and space. Therefore, rather than detailing the configurations or interactions of discrete controls, it takes a broader look at the relationship between formalised system design (what can be viewed as *control over*) and system use by each and individual organisational actor (i.e. *control in situ*). By expanding on Adler and Borys’ (1996) theoretical framework of enabling and coercive bureaucracy (also formalisation) as an analytical tool to frame these conceptualisations of control, the paper asks: *How can the development process of SCS be understood by combining the dual role of control based on system design and use?* Although the framework’s original conceptualisation is functionalistic in the sense that formalised systems are designed to either enable or coerce employees in their task performance, it also implicitly assumes that some control rests within the employees upon their reception of such systems as operational experts to offer (sustainable) solutions. Therefore, ‘management control’ for sustainability is replaced by the understanding of sustainability ‘management’ more broadly, as the responsibility of all.

The paper finds that it is the combination of *control over* (conceptualised in the formalised system design) and *control in situ* (based on its reception and use by system users in a given context) that require attention when theorising SCS. This is because SCS are not merely the product of organisational controls embedded into system design, but also individual sustainability values. Thus, it theoretically expounds on the potential of lower level staff using intra and extra-organisational information to make sustainable decisions ‘in situ’. Consequently, ‘*control in situ*’ does not mean that specific controls are designed in the formalised systems for each and every individual employee. Rather, it means that through the design of flexible or ‘enabling’ systems, employees have the opportunity to control for sustainability in their daily organisational activities by making autonomous decisions based on available information and broader organisational-level experience and knowledge, thus affecting the development process of the SCS. Therefore, conceptualisations of the SCS take on an extra-organisational and inter-generational dimension where the individual is key. Particularly, the individual process characteristics of experience, experimentation, professionalism and transparency (see Wouters and Wilderom 2008), in addition to sustainability competence, are proposed as enabling progressive sustainability performance as well as the future strategic design of

SCS. However, in contrast to previous studies on accounting as a social practice, this study recognises that such characteristics are not restricted to the organisation. As such, employees can also actively reconstitute the system from the bottom-up through the translation of wider sustainability values into organisational systems based on, for example, an interest in sustainability. As a result, the analytical distinction between system design and use is posed as particularly limited for SCS, because in reality “a more complex and ‘messy’ picture of control emerges” beyond theoretical archetypes of the control system (Bedford and Malmi 2015, 17). Consequently, it poses that future SCS studies need to frame their discussions around the dual role of control because concentrating on *either* system design *or* use is partial.

The primary contribution rests on offering a developed theoretical framework that captures the multifaceted concepts that the development process of SCS often entails. Not only does it shed light on the broader nature of control, it expounds upon the notion of sustainability MAC as a social practice with unique characteristics. To this end, SCS are embraced as characteristically distinct from MCS, affected by both firm and field (see Burritt and Schaltegger 2010), as well as the individual employee. Specifically, the concept of social control as pertaining to *individual* organisational actors’ values, rather than merely a reflection of guiding organisational values and system design is brought forward. This is deemed necessary for the successful development process of SCS, as well as sustainable futures more generally. Hence, the paper contributes to theory, practice and society by connecting perspectives on system characteristics, performance outcomes and individual corporate actors. Such extended conceptual, analytical and theoretical contributions can offer managerial insight into the value of individual ‘control’ for corporate sustainability, which also has broader societal implications. Particularly, as corporate sustainability practices become internalised in the minds of all employees regardless of position, the sustainability discourse transcends temporal and spatial dimensions.

The paper is organised as follows. First, it begins with a discussion of sustainability MAC, building the case for the dual role of control in the SCS (i.e. what is here termed as *control over* and *control in situ*). This section starts by outlining the distinct characteristics of SCS and then offers an expanded definition to guide future research. It follows by overviewing and expounding upon the role of the individual employee as necessary for the development process of SCS. Second, the paper outlines and develops Adler and Borys’ theoretical framework as an analytical tool to better understand the nature of this control relationship. This involves reviewing a selection of articles that have used the framework in mainstream MAC research to help expand of the dual role of control for the case of sustainability. Finally, a concluding discussion is offered.

2 Background

2.1 Sustainability management accounting and control

Sustainability MAC essentially extends organisational information and decision-making to include social and environmental measures, in addition to conventional

economic performance outcomes. Thus, the stream exists within the broader MAC field. Nevertheless, progress towards sustainable development has been criticised as limited within social and environmental accounting research (Bebbington and Larriaga 2014). While some authors consider it self-evident that firms strive to incorporate such concerns into managerial systems (e.g. Burritt and Schaltegger 2010), others argue that the simplification of sustainability into accounting systems has been a deliberate, unrealistic attempt to support corporate aims (e.g. Gray 2010). However, if one pays attention to the dual role of control for the development process of SCS, both managerial and critical positions have merit. While the former emphasises the potential of formalised system design for performance outcomes, the latter promotes sociological issues (related to the individual) such as governance, accountability and responsibility to affect a sustainable (organisational) change. However, combining such viewpoints is rare, even if implicit in extant sustainability research. This is perhaps due to the empirical difficulty of exploring social practices in the development process of SCS.

Research into the interplay of system design and use, or what can be termed the exploration of MAC as a social practice, has existed within mainstream MAC research for years. For example, Ahrens and Chapman (2007) emphasise how local managers within a restaurant chain “actively reconstitute their management control systems” (1) by “drawing upon the rules, procedures, ideals and targets ... of management control practice” (24). Additionally, Burns and Scapens (2000) assert that management accounting practices are also the product of internal institutionalised rules or routines as procedures for *groups* of actors *within* the organisation. Their argument assumes that change from the bottom-up is the product of collective or ‘taken-for-granted’ understandings of these established ways of working. Although these studies add much to the discussion on MAC as a social practice, the focus remains on the intra-organisational context and managerial tiers. Indeed, Burns and Scapens (2000) recognise that external factors also affect management accounting change, although their framework focuses on change as an intra-organisational phenomenon. Moreover, the potential of *individual* general employees to initiate change in situ as a response to contextual factors is also minimised through a focus on managerial tiers. The emphasis on individual employees, however, is necessary for engaging in true sustainability whereby sustainability management is everyone’s responsibility and sustainability values not only pertain to the organisation, but also the individual and other external institutions. To this end, Scapens (2006, 25) recognises the limitation of an institutional perspective for individual agency given that “actions and thoughts are constrained by existing institutions [i.e. the organisation]”. This suggests that formalised systems or practices within the firm constrain action, and change from the bottom-up is confined to these boundaries.

Recent sustainability MAC research poses that for truly effective sustainable solutions, organisations need to embrace the initiatives and competences of *individual* employees as change agents (see Johnstone 2018). Nevertheless, there is little research into sustainability MAC as a social practice. Even though sustainability research arguably requires bridging managerial and critical perspectives, extant empirical research tends to concentrate on the former. Particularly, the managerial viewpoint is often made explicit given that performance outcomes are inherent to

definitions of SCS (e.g. Pondeville et al. 2013) and frameworks (e.g. Burritt et al. 2002), and many studies concentrate on cybernetic or diagnostic controls (Lueg and Radlach 2016). This infers a preoccupation with formalised systems that validate output based on technical control (e.g. Henri and Journeault 2010; Figge and Hahn 2013), rather than input (i.e. design, implementation and use) based on the system users beyond managerial tiers (see Ball 2007).

Evidently, there appears to be a predominance of functionalist uses of control (*over*) which are easier to communicate both in research and practice given that they are often based on concrete measures. However, as corporate sustainability—and indeed the sustainability discourse in general—necessitates performance outcomes that are not only financial (Heggen et al. 2018), the iteration between input and output is essential. This is especially evident when adhering to rolling standards where validation is conditional on progressive improvements and employee involvement (e.g. ISO 14001: 2015), and static or standardised system designs can be considered inefficient. As Wijethilake et al. (2017, 573) comment: “Well-designed SCS may help corporations to specify and communicate sustainability objectives, monitor sustainability performance through feedback and controls, *and* motivate employees to participate in sustainability projects and practices by rewarding and appraising their sustainability achievements” (emphases added). This recent definition indicates that the system is not only there to guide employee behaviour in relation to performance outcomes, but also to develop general employee competence in sustainable behaviour. Nevertheless, the discussion of employee motivation through reward and compensation is often missing in theoretical and empirical discussions of the SCS (see Crutzen et al. 2017; Soderstrom et al. 2017).

2.1.1 SCS characteristics

As indicated, SCS suffer from ambiguity in terms definition, theory and performance outcomes (Lueg and Radlach 2016; Guenther et al. 2016). Therefore, it becomes of interest to outline some of their main characteristics as a baseline to move forward from.

SCS regard the combination of management accounting tools put together to meet sustainability performance outcomes by influencing the practices of individuals within the firm. However, conceptualisations of the SCS implicitly differ from the traditional MCS frameworks. First, there is the assumption that SCS are often decoupled from core MCS and are theoretically distinct (see Burritt and Saka 2006). To explicate, Riccaboni and Leone (2010) comment that more attention is required on how SCS translate into sustainable strategies, finding that decentralised structures are key. This may be due to the highly contextual nature of sustainability goals and outcomes. Further, Gond et al. (2012) suggest an array of SCS configurations from dormant-decoupled to fully-integrated where management control conditions affect the integration of sustainability into strategy.

Second, the analytical focus of SCS tends to be grounded in a bilateral relationship with the local environment. In contrast, most MCS frameworks are conceptualised at the organisational-level. This is with the exception of Broadbent and Laughlin (2009) who recognise organisational context in the conceptualisation of

their performance measurement system. Nevertheless, this framework has not yet been applied in sustainability stream. To detail, Wijethilake et al. (2017) comment that SCS are the means for organisations to respond to strategic pressures from the institutional environment. Moreover, external stakeholders are often presented as instrumental for the design of sustainability MAC practices and systems (e.g. Rodrigue et al. 2013; Sands et al. 2016). There is also the viewpoint that organisational systems can influence the field (Burritt and Schaltegger 2010), or are part of a recursive political process to offer more sustainable futures (Moore 2013). In this sense, experiences learnt by the firm can also impact on the local context, indicating a governance perspective which is becoming increasingly relevant in accounting studies to link policy and practice (see Bebbington and Unerman 2017; Rinaldi 2019). Nevertheless, organisational-level (see Martyn et al. 2016) analytical tools such as Simons' (1995) functionalist levers of control (LOC) (e.g. Gond et al. 2012; Arjaliès and Mundy 2013; Rodrigue et al. 2013; Journeault et al. 2016) or Malmi and Brown's (2008) conceptual MCS-package (e.g. Baker et al. 2012) dominate SCS research to frame or explain findings. However, such frameworks appear in contrast to the wider analytical focus (i.e. the extra-organisational and inter-generational aspect) that SCS necessitate.

Particularly, Simons' (1995) LOC is the most common framework applied in the study of SCS. At the organisational-level, this can be seen as reflective of the dual role of control, balancing the tensions between flexibility/innovation/creativity and control. Here, the interactive or belief controls can be taken as *control in situ* based on formalised system design through the diagnostic or boundary controls as *control over*. However, this assumes that organisationally-bound values take precedence over those of the individual. The core of Simons' argument relies on the tension between control and empowerment, recognising the need for *top management* to control employee initiative that deviates from organisational strategy. Here, individual agency and values are minimised as employees actively (re)constitute the system through managerially-defined accepted patterns of behaviour, rather than individual initiative. Hence, an implicit importance is attached to control, rather than empowerment through conceptualisation of the levers. Consequently, the LOC framework is approached from a functionalist perspective in the sense that employees are agents constrained by the rules endowed upon them by top-management. This poses some challenges with regard to the broader discussion on conceptualisations of the SCS as characteristically distinct from MCS frameworks.

To detail, Simons LOC is conceptualised as confined within the organisation's borders. Therefore, it neglects the inter-generational aspect inherent to SCS as the extra-organisational dimension is embedded into the organisation's internal belief systems, rather than the individual employee beyond managerial tiers. Such belief systems, as Simons suggests, "articulate values and direction" (Simons 1995, 179). To this end, the alignment of external social, political and environmental sustainability values of stakeholders into organisational strategy and corporate culture is dependent primarily on top-management who make sense of external 'beliefs', incorporating those deemed most salient into organisational systems (see e.g. Arjaliès and Mundy 2013; Rodrigue et al. 2013). Yet, this can be considered limited for two reasons: (1) due to the rapid pace of sustainability policy developments in complex,

multi-level governance architectures and (2), due to the fact that top management may not necessarily be the organisation's sustainability experts. Consequently, there may also be a time-lag or misalignment between external sustainability values into organisational belief systems which are theoretically based on Simons' functionalist approach to innovation and creativity as an organisational-level phenomenon.

The scholars who have used the LOC framework in sustainability MAC research implicitly recognise its limitation in assuming SCS as solely an organisational phenomenon. This is captured by coupling the framework with broader stakeholder or institutional perspectives in order to explain the findings (e.g. Rodrigue et al. 2013). Moreover, the LOC framework assumes that general employees are a *group* of internal stakeholders whose concerns are integrated into the formal system *by management*. This means that employees' 'viewpoints' per se are not directly expressed in constructions of the system, thus attaching further importance to a managerial perspective rather than a true interaction between managers and employees for the development process of the system. Consequently, the use of Simons' LOC for SCS research does not clearly address the interaction of sustainability values by individuals as embedded within both an intra-organisational and extra-organisational context *and* formalised system design. This means that its use does not incorporate a critical viewpoint as its focus on managerial design indicates the dominance of '*control over*' where managers design systems to 'coerce' employees into acting in particular ways. Even if there is the viewpoint that this design can also empower employees (see also Adler and Borys 1996), the empowerment is unidirectional in the sense that it is only dictated by the system, rather than also the individual employee in a particular context. Thus, a social-constructivist perspective remains wanting.

Third, SCS design is frequently perceived as being more complicated given that firms often feel obliged to formalise what they perceive as 'abstract' sustainability objectives into local contexts. For example, international SDGs such as that of 'zero hunger' may appear detached from the locale. This means that more emphasis is placed on interpretation processes by organisational actors to formulate 'appropriate' performance outcomes to achieve corporate sustainability aims within a complex, overarching governance structure (Johnstone 2019). This is often viewed as difficult in practice and thus requires reiteration between system design and use due to the 'experimental' nature of SCS.

Finally, the conceptualisation of socio-ideological control within general MCS frameworks implicitly rests with treating employees as a homogeneous group to be controlled (e.g. Malmi and Brown 2008), rather than the individual actively constructing the system from the bottom-up in a response to both organisational *and* personal values. This suggests that the SCS remains constrained within a strategic framework set out by top management, and neglects the viewpoint that general employees also have something to bring to its development. Nevertheless, recent studies suggest that SCS necessitate the involvement of *all* employees for strategic design and internal change beyond managerial tiers (Pondeville et al. 2013; Sands et al. 2016), across organisational and generational boundaries (Johnstone 2018). To this end, there has been the recognition that communication, knowledge and commitment are features of sustainability management within organisations, thus bridging both strategic and operational levels (see Albelda Pérez et al. 2007; Ball 2007;

Pondeville et al. 2013). Here, individuals at various tiers are paramount for embedding sustainability thinking into organisational practice (see Bouten and Hoozée 2013). This indicates that design decisions at the strategic level cannot be realised without the operational support of general employees and suggests that control, in essence, also rests in the individual, not only the system. However, little research attention has been dedicated to understanding the role of individual system users at the operational level (see Visser and Crane 2010; Catasús and Cäker 2016). This is especially significant for the development process of SCS because, as Schaltegger (2017, 4) comments, “no single company or management decision is likely to create any sufficient [sustainability] solution” without the active participation of employees.

Taken together, conceptualisations of SCS are distinct from general MCS frameworks. Evidently, the processes (or inputs) of SCS, not only the outcomes, are important for corporate sustainability strategies and practices in intra and extra-organisational contexts. Nevertheless, there is the difficulty in formalising abstract sustainability goals into concrete measures. As such, the design and use of SCS are highly contextual as well as rely on the involvement of each and every corporate actor to affect a truly sustainable change beyond short-term, ‘managerialist’ performance concerns. Although, the majority of system theorisations within general MAC research are concentrated within the boundaries of a firm and neglect the input of the controlled. Therefore, building upon Guenther et al. (2016) and Wijethilake et al. (2017), the following definition of SCS is offered to guide this research:

SCS are the dynamic constellation of management accounting tools that connect organisational strategy with operations in a given context by providing information and direction, as well as monitoring and motivating employees to continually develop sustainable practices and procedures for future improved sustainability performance.

This definition infers that employees are not only guided by the system, but also have the capacity to develop the system from the bottom-up in a particular context which brings with it nuanced sustainability problems and attitudes. Thus, employees are motivated not only to participate in meeting objectives (see Wijethilake et al. 2017), but also to actively contribute to the development process of SCS and sustainability in general.

Ultimately, extending conceptualisations of the dual role of control based on formalised system design *and* use by the individual employee therefore moves the discussion beyond accounting to accountability. This is not to say that specific controls are tailored to individual employees. Rather, it asserts that through flexible system designs, the individual employee has the power to affect a positive, sustainable change to the SCS from the bottom-up by being involved in its continual strategic (re)design (i.e. development) over time and space. Here, the general employee is an active component of the (re)design process by offering contributions through practice in situ at the operational level, rather than relying solely on formalised policy and procedure from the top. Such an argument also bridges managerial and critical perspectives, as well as suggests a movement from conventional functionalist assumptions embedded within traditional MAC research to more of a social constructivist

approach. While the former assumes that system design itself is sufficient to achieve desired performance aims by directing employees, the latter poses that system success is also dependent not only on its understanding and use by operators from the bottom-up (i.e. the conventional accounting as a social practice approach), but also the recognition that individual employees are also active contributors to SCS (re) design in a particular context. This brings to light issues in relation to sustainability governance, accountability and responsibility. Nevertheless, most empirical studies within sustainability MAC still apply functionalistic frameworks (top-down) to frame their research and focus on short-term, managerial goals, founded upon the *intra*-generational aspect. This is perhaps due to the borrowed models, concepts and tools from the mainstream strand that neglect temporality in their conceptualisation, as well as focus on either system design or use but do not confront the iterative relationship between analytical viewpoints. However, as sustainability poses “meeting the needs of present generations, without compromising those of the future” (Brundtland Commission 1987), a long-term scope is required that satisfies both an *inter*-generational and *extra*-organisational approach (see Guenther et al. 2016 positioning framework), founded upon the individual actor for effective change. This suggests that new theoretical perspectives are necessitated given increasing societal demands on the firm and the complexities sustainability control entails.

2.2 The dual role of control

As illustrated, much research attention has been devoted to how formalised accounting systems produce varied social practices (Cruz et al. 2009). Yet, less is known about the ability of individual actors to also translate local practices into formalised accounting systems (see Goretzki et al. 2017). Consequently, this paper argues that in order to understand the development process of SCS, the combination of *control over*, embedded in flexible system design, and *control in situ*, system use and development in a particular context, merits more scholarly attention.

Arguably, the combination of *control over* and *control in situ* shares some parallels with the exploitation-exploration debate in management accounting innovations. While exploitation regards harnessing existing resources to create new opportunities, exploration regards the search for new alternatives (March 1991). These are viewed as two strategical alternatives that a firm must decide upon. However, the management of SCS, as indicated, entails both aspects. This is because employees are guided within systems based on available resources whilst also increasingly required to bring novel solutions in order to improve sustainable performance (see e.g. ISO 14001: 2015). In this sense, sustainability may be considered a MAC innovation that requires all organisations with SCS to pursue ‘ambidextrous strategies’ (see Bedford 2015). This is because such firms exist in complex multi-level governance architectures whereby their needs and resources are balanced against those of the broader social and environmental context (Johnstone 2019). This implicitly suggests that patterns of SCS use are based on balancing managerial tensions between exploitation and exploration, which are arguably complex phenomena to theoretically capture.

Nevertheless, extending conceptualisations of the dual role of control becomes necessary for the theoretical development of SCS in contemporary MAC research. Specifically, given the dynamic relationship between strategy and operations, understanding how key formal performance measurement targets such as discrete KPIs or EPIs (*control over*) are communicated, used and embedded within SCS by the operational actors becomes of interest. This is necessary to inform research on the *actual* processes of management *control in situ* (see Sundin and Brown 2017), beyond managerially or strategically-orientated studies that focus on reporting or disclosure (Riccaboni and Leone 2010) which can be seen as greenwashing, window-dressing or even underestimating the true corporate practices (Johnstone 2018). Nevertheless, considering that most extant research focuses on *control over* via system design and managerial perspectives, it becomes of interest to expound upon what has here been termed *control in situ*. This, as argued, focuses on both the reception of the formalised system by the general employees, and their ability to bring extra-organisational values to the development process of the SCS as a construct not isolated to the firm. Ultimately, it is the interaction of both forms that is necessary for improved sustainability performance over time and space. Thus, understanding the dual role of control for the development process of SCS bridges perspectives on the system, the individual, and performance measures and outcomes.

2.2.1 *Control in situ*

Control in situ builds upon the notion of accounting as a social practice, but adds the dimension that employees are not only guided by formal systems and organisational values, but are also active contributors to system development due to their internalisation of extra-organisational and inter-generational guiding sustainability values. Arguably, its foundations go back to Bourdieu's (1985) concept of habitus as the values and norms (i.e. resources) carried by the actor define his or her capacity to act in a given situation and context (see also Malsch et al. 2011). Although this perspective links the macro (i.e. field) and micro (i.e. individual) environment, the ability to act is contingent on the actor's possessed capital (economic, social or cultural). Here, actors are assigned a social position by others in a field. This position is "structured internally in terms of power relations" (Shenkin and Coulson 2007, 302) based on perceived symbolic capital. As such, actors become predisposed "to act and react in certain ways in particular situations according to the amount of capital they possess" (Malsch et al. 2011, p. 198). However, as the sustainability discourse asserts the capacity of *all* actors to act as sustainability as possible, regardless of possessed capitals (i.e. power), the use of Bourdieu's (1990) broader sociological theory can be considered limited in offering a theoretical framework for the development process of SCS; i.e. sustainability as the responsibility of all. Resultantly, a theoretical framework is required that captures the combination of what has here been termed *control over* and *control in situ* to help explain the complex development process of SCS in terms of system characteristics, the individual and performance effects. This will be brought forward later in the paper.

2.2.2 Social control

Social control is put forward as a useful concept to understand the development process of the SCS as founded not only upon the system, but also the individual corporate actor beyond managerial tiers. It is here seen as a means to improve sustainability performance outcomes, rather than an ends. In this sense, ‘greening’ the firm is not only the outcome of system design, but also the result of the “roles, motivations and incentives of the agents (managers and employees)” (Sundin and Brown 2017, 621). Nevertheless, social control is difficult for both management and academics to define, never mind measure, and there appears to be ambiguity over its position.

Regarding its definition, social control has been addressed in various ways within the mainstream MAC literature. Building on Ouchi (1979) and Schein (2004), it is commonly seen as shared values, norms and beliefs that guide daily work practices. To this end, Bedford and Malmi (2015) state that it “is intended to capture the effects of informal processes that result in employees accumulating values and basic assumptions infused with symbols, rituals, language, and social structures of the organisation (Schein 2004)” (2015, 8). Nevertheless, Chen et al. (2009) also relate it to tangible elements such as employee selection, training, job descriptions and duties. Meanwhile, Stouthuysen et al. (2017, 7) pose it as “interactive goal setting, regularly organized meetings, and joint workshops ... to promote shared beliefs, norms, and values”. These definitions consequently suggest that employees are a homogenous group which is primarily guided by internal, formally-designed MCS; i.e. organisational values. However, social control also relies on tacit knowledge which is personal and often unconscious (see Boiral 2002). It is also useful for ensuring coordination in supply chains (Cäker 2008).

Regarding its position within the MCS in mainstream studies, Alvesson and Kärreman (2004) pose social control as embedded within all the other control elements, whereas Widener (2004) states it as the foundation to other controls. Meanwhile, Gerdin et al. (2018), through their concept of value-based control, pose it as moderating the effect of MCS on performance. This ambiguity is also reflected in the sustainability field. For example, Pondeville et al. (2013) find that the various elements of social control reduce environmental uncertainty through the implementation of an SCS. Further, Albelda Pérez et al. (2007) embrace it throughout and beyond the SCS via their embeddedness framework. Finally, Johnstone (2018, 11), who reviews its use within the environmental sustainability MAC field, presents it as moderating the development process of SCS.

Although the concept is diverse in terms of its properties and position, Johnstone (2018) suggests that expanding the definition of social control is fruitful to sustainability *management* in the broader sense of the term, beyond managerial tiers. She argues that the properties of social control (i.e. sustainability knowledge, competence and commitment) belong to individuals within the firm and are built through communication, dialogue, education and training. As such, they are the result of both formalised system design as well as personal experience and internal disposition. Building on Johnstone’s (2018) definition, social control is here defined as: *the norms and values, borne from both the organisational and the individual’s context, which guide employees in their daily work*. It consequently emphasises that

sustainability norms and values are not only guided by organisational values, but also personal ones. In this sense, social control is more nuanced than the typical group-level clan or cultural controls that commonly present employees as a homogeneous group to be controlled by the system (see Malmi and Brown 2008). Thus, developing conceptual understandings of social control could help elaborate upon *control in situ* and improve sustainability performance. This, essentially, extends beyond the firm to sustainability in all aspects of life. Specifically, tacit knowledge from both intrinsic and extrinsic motivations is proposed as instrumentally affecting a sustainable change.

2.2.3 Boundary spanners

Boundary spanners can be viewed as manifestations of social control in organisations. However, little is known about the use of individual boundary spanners as intended or unintended strategies (i.e. a control mechanism through either formal design or the individual's initiative) to improve performance measures and outcomes. Specifically, boundary spanners are the people who exhibit the boundary spanning characteristics which are reflective of post-modern organisations based on governance, systems, networking, collaboration, interdependency and experimentation (see Williams 2002). Such characteristics indicate parallels with the critical social and environmental accounting stream strand that places emphasis on sociological issues such as governance, accountability and responsibility. Here, corporate actors are given more autonomy and are empowered to act based on individual knowledge domains, even though the boundary spanners may be deliberately employed as a corporate strategy. Particularly, Cross and Parker (2004) emphasise that boundary spanners facilitate sharing experience through various groups of individuals that, in the organisational environment, may be disconnected by role, location and hierarchy. Meanwhile, Breunig and Roberts (2013) further that boundary spanners embody the characteristics—among others—of being more experienced and operationally-minded, furthering that “it has become important to expand the accounting toolkit to mobilise and deploy [such] intangible assets” (2013, 259).

There is also the implicit assumption of boundary spanners within the sustainability literature as the means to integrate social and environmental concerns throughout the organisation and beyond. For example, Heggen et al. (2018, 19) comment that “the scope of environmental responsibility as perceived by the managers [is] also shaped by the views and involvement of internal and external stakeholders who take on the role of environmental experts and champions”. Moreover, Visser and Crane (2010) suggest that these ‘change agents’ can make a difference by assuming different roles such as expert, facilitator, catalyst and activist. Finally, Crutzen et al. (2017) find that ‘sustainable mind-packages’ are often placed specifically on new employees in addition to the designated job roles. Taken together, these findings point to the potential of key individuals from all organisational tiers in influencing the integration, coordination and diffusion of sustainability issues and objectives. To this end, ‘control’ in the conventional hierarchical sense is complemented by organisational governance that permeates throughout all tiers.

Given the illustrative examples above, boundary spanners can be conceptualised in two senses which are not mutually exclusive: (1) as those organisational actors with two roles which can be appointed by the firm or self (the role spanner); (2) as those organisational actors which span intra and inter-organisational boundaries (the literal boundary spanner). For sustainability, boundary spanners can be seen as social control mechanisms that embody the sustainability discourse over role, departmental or organisational boundaries. They are also presented as embodying both personal and organisational values. Regarding the first role above, and in relation to sustainability, the boundary spanner can be an employee who has (a) a professional competence that differs from his/her competence of assumed sustainability specialist, or (b) a self-appointed 'specialist' due to an overwhelming desire to support the sustainability cause based on, for example, a passionate interest; what Ball (2007) terms a tempered radical, or workplace activist. In this sense, boundary spanners are conceptually distinct from institutional entrepreneurs who are typically associated with the active agency of top management—or consultants (Sharma et al. 2010)—to change institutions within a field (Maguire et al. 2004) based on their available resources (see e.g. Hyvönen et al. 2012). Regarding the second role, boundary spanners can exist in the literal sense across organisational or departmental boundaries to ensure the developmental process of sustainability accounting practices and systems, as well as in the inter-organisational environment (see Dekker 2016). However, both forms are not mutually exclusive and the boundary spanner can be strategically or unintentionally employed. That is, key personnel can be appointed a sustainability role to advance performance outcomes as part of the development process of a SCS (a managerial approach). Or, there may be individuals who function as boundary spanners due to intrinsic norms and values regarding sustainability (a critical approach). Nevertheless, both types may be strategically valuable to the firm in the development process of the SCS. And, over time, the extrinsic and intrinsic motivations become more difficult to differentiate as sustainability becomes the responsibility of *everyone*.

Figure 1 below acts as a visual summary of the preceding discussion by placing the SCS into its context with regard to space and time. First, it outlines that constructions of the SCS cannot be confined to the analytical level of the organisation. This is reflected in the permeable borders between the intra and extra-organisational environments. Second, it emphasises that strategy and operations are connected through the development process of the SCS over time, reflected in the figure's depth. This process is also affected by contextual aspects such as stakeholder pressure or norms and values embodied by employees in the workplace, supplementing the previous point that constructions of the SCS as embedded in context. Rather than outlining the discrete configurations or interactions of specific controls, the figure focuses on the broader relationship between system design and use, conceptualising the SCS as inclusive of its strategic development and management accounting practices by local actors. The strategic elements are represented by the formalised SCS design which takes a managerial or top-down approach (i.e. *control over*). Meanwhile, the operational elements constitute the individual actions taken in order to achieve performance outcomes. Therefore, it is the interaction between system design and use by individual corporate actors over time and space that is necessary for the development

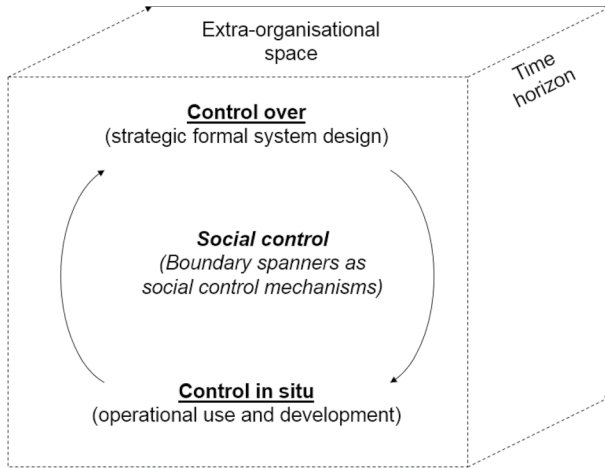


Fig. 1 Visual summary of the SCS based on the iterative relationship between system design and use

process of SCS to achieve not only short-term performance outcomes, but also long-term sustainability goals. This is reflected in the cyclical and developmental nature of the SCS, illustrated in the figure's arrows. Third, the concept of social control (e.g. through boundary spanners) is offered as useful to bridge perspectives between system design and use for SCS within firms. To explicate, these concepts are presented as valuable to inform sustainable futures not only at the organisational level, but also through extra-organisational and inter-generational dimensions as the sustainability plight becomes internalised in the 'responsible' individual. To this end, both organisational and personal values are instrumental to the development process of the SCS.

Taken together, this summative model illustrates the link between the system and the individual for sustainable performance outcomes. It has both short and long-term horizons, as well as spans professional and personal arenas. Consequently, the following discussion aims to position these assumptions under the theoretical framework of enabling and coercive formalisation (Adler and Borys 1996). This is provided as an analytical tool which is developed to help inform future research into sustainability MAC, especially the development process of the SCS.

3 Adler and Borys' enabling and coercive bureaucracy

Adler and Borys' (1996) seminal framework [*Two types of bureaucracy: enabling and coercive. Administrative Science Quarterly, 41(4), 61–89*] is considered particularly useful in explicating the iterative relationship between formalised system design and its use by the general employees. This is because the framework emphasises the role of social knowledge to enable the formalisation of work practices (see Chapman and Kihn 2009). As such, it proposes a more nuanced understanding of the system characteristics and development processes from the users' perspective.

The argumentation is not that one form of control is better than the other, but rather that understanding the combination of formalised system design (i.e. *control over*) and its use by corporate actors (i.e. *control in situ*) is necessary. This section consequently builds the case for the use of the framework in future studies on the development process of SCS.

3.1 Overview of the framework

The work of Adler and Borys in the mid-nineties (hereafter A&B) stems from the then recent wave of literature regarding social empowerment and autonomy, moving beyond bureaucratic ‘top-heavy’ control (e.g. Roberts 1991; Barker 1993; Simons 1995) to incite employee commitment (see Kirkman and Rosen 1999). Thus, it helps improve understandings of the interrelationship between the bureaucratic design of formalised systems *and* their use in relation to behavioural perceptions (Adler and Chen 2011) and outcomes (Kondo et al. 2013). Nevertheless, one can argue that this ‘commitment’ is the product of structural control created by management and management systems (see Adler and Chen 2011), rather than psychological aspects intrinsic to the general employees themselves (see Baird et al. 2017). This is because A&B assume that systems are designed to produce particular outcomes in employee task performance within the intra-organisational context.

Primarily, A&B suggest that there are two discrete design principles regarding formalisation in bureaucracies—coercive and enabling—which can be compared along three dimensions: (1) system characteristics; (2) system design process; and, (3) system implementation. However, given the difficulty in distinguishing between system design and implementation, Wouters and Wilderom (2008) later adopt the term ‘development process’. This term is used herein given the emphasis on continual development for SCS which means that it is not easy to demarcate where design ends and implementation begins. The design principles are assumed as a dichotomy that induces negative and positive employee attitudes respectively. As such, A&B’s research contribution is founded upon the contradictions in the attitudinal effects that formalisation has on task performance, arguing that the two types of formalisation have distinct features. Specifically, coercive features include power asymmetries, hierarchy, compliance, constraint and low trust, resulting in a lack of information-sharing, collaborative problem-solving or learning. Meanwhile, enabling features include decentralised power (flat structures), autonomy, flexibility, enablement and high trust, resulting in the opposite. A&B propose that organisations can be described based on the degree and type of this formalisation. To illustrate, if a firm relies more on bureaucratic control, the SCS characteristics can be designed more coercively to maintain differentiation between organisational levels. On the other hand, if employees are required to respond *in situ* to problems as and when they occur, the SCS can be designed to embrace more enabling features. This infers that system design and patterns are not sequential as Gond et al. (2012) suggest, but rather they vary in response to contextual characteristics and organisational bureaucracy.

In addition to the distinct features, four design principles are posed as differentiating between coercive and enabling systems, namely: repair, flexibility, internal transparency and global transparency. System users are required to ‘repair’ system issues in situ by harnessing knowledge and an understanding of the working environment from localised ‘internal’ and overarching organisational ‘global’ transparencies. That is, operational repairs require an understanding of task or departmental role and/or function (internal), and how this fits into the broader organisational picture (global). For this, the condition of ‘flexibility’ is inherent as actors are required to respond in a timely manner to a given problem. This can be understood in relation to knowledge and action whereby the transparency conditions constitute the former and repair the latter. Nevertheless, this action is conditional on the permission scope to act (i.e. the flexibility embedded in the design principles of the system). As such, enabling systems involve horizontal flows of information, whereas coercive systems involve hierarchical. This can be understood as “[a] coercive use of MCS ... taking one-side in the relationship between management and their subordinates (i.e., the management side), whereas an enabling use ... [as stimulating] decision-making and/or control in the interactions between the management and their subordinates” (Van der Meer-Kooistra and Scapens 2008, 367). Thus, an enabling system is arguably suited to the development process of the SCS where more emphasis is increasingly placed on each and every employee, beyond managerial tiers.

Overall, the framework proposes that the development process of MCS is affected by discrete design characteristics which impact employee attitudes towards task performance. At the time of its construction, discussions based on user perception could be regarded as something ‘new’. However, given that the framework is based on the perception of system users, what may be considered as enabling by some, may indeed be received as coercive by others. Further, designating controls good or bad based on user perception does not necessarily infer quality (Tessier and Otley 2012). As such, contemporary reality appears to complicate the framework’s theoretical underpinnings, motivating the need for expanded theorisations. This is further complicated by the sustainability discourse that is not merely an intra-organisational phenomenon. Nevertheless, A&B’s work is still considered particularly useful to highlight the iterative relationship between what is here termed the dual role of control based on system design and use for the development process of the SCS over time and space.

3.2 Applications in extant management accounting and control research

Over recent years, A&B’s work has been gaining popularity in mainstream MAC research. Therefore, this section reviews applications of the framework which help shed light on what has here been termed the ‘dual role of control’. Consequently, it does not constitute an extensive overview of the framework in MAC research. For example, there are studies that use the term ‘enabling’ without explicitly referring to the work of A&B (e.g. Baird et al. 2017). Moreover, there are others that use the framework to discuss findings, rather than frame their research (e.g. Heggen et al. 2018).

Although the reviewed articles display an array of philosophical positions and methodological approaches, it appears that most concentrate on *either* system design (e.g. Ahrens and Chapman 2004; Chapman and Kihn 2009; Mahama and Cheng 2012) *or* the development process (e.g. Free 2007; Englund and Gerdin 2015) as their analytical frame, but rarely confront the iteration between system design and use in their analyses. This is with the exception of Goretzki et al. (2017) who suggest that local actors also have the potential to ‘formalise’ global accounting and control systems by applying local knowledge. And, although the core of Goretzki et al.’s argument promotes local actors as change agents, the contextual specifics of SCS may not necessarily require transferral to global equivalents; rather, SCS change may also be a local phenomenon while the global systems remain flexible enough to allow for local contingencies in the (re)design process. Additionally, the reviewed studies generally find that enabling and coercive formalisation concurrently exist (Ahrens and Chapman 2004; Free 2007; Jordan and Messner 2012), tight control is also coupled with flexibility (Jørgensen and Messner 2009) and enabling formalisation (i.e. bureaucracy) affects more than performance (Chapman and Kihn 2009; Jordan and Messner 2012). Notwithstanding, much of this empirical research concentrates on higher or middle-managerial tiers (e.g. Ahrens and Chapman 2004; Chapman and Kihn 2009). As such, there remains scope for research into the development process of SCS that involves *all* system users and the duality of control, which could prove fruitful for integrating sustainability into conventional MCS.

As explicated, A&B’s framework emphasises the role of formalised bureaucracy in a functionalist way. Regarding MCS, it assumes that employee creativity regarding task performance can be achieved through the design of formal systems (Adler and Chen 2011). Yet, as Grabner and Speckbacher note (2016), *creativity* as planned within formalised MCS inherently compromises its very essence in the sense that creativity resides within the individual not the system. As previously suggested, this also has implications for Simons’ LOC. To this end, developing the process characteristics of experimentation, experience, participation and professionalism (Wouters and Wilderom 2008) can be seen as building upon a social constructivist analytical use of the framework, in addition to its conventional functionalistic intent. Specifically, Wouters and Wilderom (2008) posit that the development process of the system is affected by employee experience, which builds upon skills and knowledge in a local context (see also Goretzki et al. 2017), as well as professionalism which is indicative of positive attitudes to the formal system. This is in addition to experimentation with performance measures and transparency of the system, which both augment an enabling system from the perspective of the employees. Therefore, while the following development recognises the importance of formalised system design for control, it additionally aims to tease out the nuances of control that reside within the perspectives and abilities of system users as of equal importance. This resonates with Bedford and Malmi (2015, 18) who posit that the social aspects of control “are more likely to exhibit a complementary relationship with bureaucratic controls”. As such, the intention of the following paragraphs is not to offer a comprehensive summary of the framework’s extant application in MAC research, but rather to concentrate on those nuanced aspects of particular relevance for developing conceptualisations of *control in situ*.

3.2.1 Inferences of *control in situ* via the process characteristics

The process characteristics (e.g. experimentation, experience, participation and professionalism) proposed in recent applications of the framework essentially relate to employees (both managers and general employees) using their own knowledge and understanding as personal assets to mobilise effective performance outcomes (see Wouters and Wilderom 2008; Wouters 2009; Wouters and Roijmans 2011; Groen et al. 2012a, b). Particularly, Wouters and Roijmans (2011) suggest that control within the system depends on the process characteristics embodied in the system user. In this sense, individual characteristics in addition to organisational controls are vital to the development process of systems. Nevertheless, Wouters and Wilderom (2008) emphasise that these process characteristics are the result of an 'official' MCS being in place. This, consequently, minimises the potential of the individual's extra-organisational values and experiences for the system's development. In this sense, the social-constructivist perspective for management control remains side-lined. It also brings forth the issue of emphasising functionalist frameworks to understand the development process of SCS which are conceptualised as existing in dynamic interaction with the extra-organisational and inter-generational contexts. Notwithstanding, the following paragraphs overview how the process characteristics have been used in the reviewed extant MAC studies. This, therefore, builds the case for the expanded framework's potential applications for the sustainability stream where *control in situ* (i.e. SCS use) is not only the product of organisational values embedded into formal system design, but also the result of extra-organisational phenomena.

Many of the articles—whether implicitly or explicitly—elaborate upon the process characteristics as instrumental to the system's development process. For example, Ahrens and Chapman (2004) recognise that employees are not passive recipients of system design which implicitly suggests *control in situ*. Meanwhile, Goretzki et al. (2017) suggest that local actors both use and manipulate codified knowledge from the formal system, developing it on route. Further, Wouters and Roijmans (2011) note that a performance measurement system (PMS) should serve both management and the system's users by looking at the characteristic of experimentation in the design stage. They further that experimentation requires the integration of knowledge based on representation, learning and transformation by "involving users, exchanging knowledge, [and] integrating it in new accounting information" (2011, 730). Meanwhile, Groen et al. (2012b) explore the 'participatory development of performance measures' for employee behaviour in task performance, finding that there is a strong relationship between attitude and social pressure, where the latter influences the former. This participation perspective is echoed by other authors (e.g. Mahama and Cheng 2012; Henttu-Aho 2016; Wouters and Roijmans 2011; Groen et al. 2012). Additionally, Henttu-Aho (2016) suggests that the professional mind-set and competence of each employee affect system success beyond its formal design. Here, there is the recognition that the system is only part of the explanation guiding its use, and that there are other 'internal', necessary elements affecting its development process over time and space (see also Wouters 2009; Wouters and Roijmans 2011). Taken together, such findings suggest that understanding *control in situ*

is vital given that it is a source which is also often perceived as powerful in guiding action.

To summarise, Table 1 provides an overview of the reviewed articles which were selected based on their contribution to understandings of system use via the implicit and explicit use of the process characteristics (i.e. *control in situ*).³

3.3 Potential applications for sustainability MAC

For sustainability, moving beyond hierarchical control is necessary given that the “[a]lignment of performance measures with strategic sustainability objectives requires the design of appropriate management control systems to better motivate employees” (Dutta et al. 2013, 457). In this sense, the SCS necessitates ‘enabling’ design features to motivate employees and build upon their individual process characteristics in addition to typical, functionalistic ‘coercive’ elements. Nevertheless, these systems also must recognise the individual values, borne from the extra-organisational context, that sustainability entails for improved performance outcomes. To this end, A&B’s theoretical framework can serve as a useful analytical frame to elaborate upon the dual role of control for the development process of SCS. This is because the coercive role can help firms reduce options and increase predictability, whilst at the same time, an enabling role can promote flexibility and creativity by involving the system user. To this end, the intermediary layer of the process characteristics is considered particularly useful for highlighting the nuances of *control in situ* based on each and every corporate employee beyond ‘homogeneous’ cultures or clans for the development process of the system. Specifically, Wouters (2009) poses that developing these characteristics serves to combine perspectives from organisational studies which focuses on the individual, operations management which focuses on the system’s characteristics, and accounting which focuses on the development process of performance measures and outcomes. Bridging these perspectives is arguably needed for truly sustainable futures that extend beyond intra organisational and generational confines. As such, this section develops the link between the system and its use for the development process of SCS by focusing on the process characteristics as inputs which moderate sustainability performance as an outcome. Essentially, the two forms of control work together, and should not be analytically separated given that the development process of the SCS requires a continual iteration between operations and strategy in complex multi-governance architectures. Rather, they can be understood from the perspective of how the system is developed and/or received at a given point in time. This being said, more attention is paid here to *control in situ* as the underrepresented aspect within the field of MAC as it is viewed as essential for ensuring sustainable futures over time and space.

³ Note that the table is based on the preceding interpretation and analysis of the framework’s application within the field. In this sense, the author recognises that this may not reflect the true intent of the reviewed studies.

Table 1 Chronological overview of the reviewed articles, their analytical orientation and contribution to understanding *control in situ*

References	Title	Orientation	Contribution to understandings of <i>control in situ</i>
Ahrens and Chapman (2004)	Accounting for flexibility and efficiency: A field study of management control systems in a restaurant chain	System characteristics	Employees are not passive recipients of systems; employee discretion
Free (2007)	Supply-Chain Accounting Practices in the UK Retail Sector: Enabling or Coercing Collaboration?	Development process	Dialogue reduces power asymmetries and fosters coordination and organisational learning, as well as safeguards opportunistic behaviour and contingencies
Wouters and Wilderom (2008)	Developing performance-measurement systems as enabling formalization: A longitudinal field study of a logistics department	Development process via process characteristics	Developing <i>control in situ</i> (i.e. repair) via the process characteristics of experience, professionalism, experimentation and transparency. Recognises that humans are instrumental for bridging system and performance perspectives through the development process of PMS
Chapman and Kihn (2009)	Information system integration, enabling control and performance	System characteristics	(Managerial) perceptions/attitude affected by more than performance outcomes. This suggests that other factors are at play beyond the MCS or PMS itself
Jørgensen and Messner (2009)	Management control in new product development: The dynamics of managing flexibility and efficiency	The relationship between system characteristics and the development process	A combination of formal tools and informal information-sharing are needed to incite commitment to enabling control
Wouters (2009)	A developmental approach to performance measures—Results from a longitudinal case study	The characteristics of the development process	Developing <i>control in situ</i> (i.e. repair) via the process characteristics of experience, professionalism, experimentation and transparency. Recognises that humans are instrumental to bridging system and performance perspectives through the development process of PMS/MCS

Table 1 (continued)

References	Title	Orientation	Contribution to understandings of <i>control in situ</i>
Wouters and Roijmans (2011)	Using prototypes to induce experimentation and knowledge integration in the development of enabling accounting information	Development process via process characteristics	Employee motivation to complete tasks depends on positive attitudes towards formal systems and experimentation from the outset to integrate knowledge based on representation, learning and transformation
Groen et al. (2012a)	Enabling performance measurement in a small professional service firm	Development process and implicitly the process characteristics	Features of an enabling PMS increase employee understanding of strategy, as well as knowledge exchange and creation
Groen et al. (2012b)	Why do employees take more initiatives to improve their performance after co-developing performance measures? A field study	Development process and implicitly the process characteristics	Participation in the development of performance measures positively influences employee behaviour relating to attitude, social pressure and the capability to take initiative
Jordan and Messner (2012)	Enabling control and the problem of incomplete performance indicators	Development process as founded upon system characteristics	(Managers) attitudes towards formal controls change over time, proposing that the design features should be seen as an interaction process between management and system users rather than a mechanism for <i>control over</i>
Mahama and Cheng (2012)	The effect of managers' enabling perceptions on costing system use, psychological empowerment, and task performance	System characteristics	(Managers) perceptions of enabling formalisation positively affect system performance. Employee competence and empowerment are necessary for enabling systems

Table 1 (continued)

References	Title	Orientation	Contribution to understandings of <i>control in situ</i>
Englund and Gerdin (2015)	Developing enabling performance measurement systems: on the interplay between numbers and operational knowledge	Development process	Experience-based experimentation affects both generalised and specific organisational knowledge. Further, transparency can both open up the 'black-box' of PMS design (e.g. <i>control over</i>), as well as allow employees to interpret PMS data (e.g. <i>control in situ</i>)
Henttu-Aho (2016)	Enabling characteristics of new budgeting practice and the role of controller.	System characteristics	Employees' attitude towards the system needs to be aligned with professional mind-set and competence, suggesting conditions beyond the system are necessary for its success
Goretzki et al. (2017)	Exploring the roles of vernacular accounting systems in the development of 'enabling' global accounting and control systems	Development process and explicitly the process characteristics	Employees are active components of the development process of systems as 'knowledge transformation devices'. Here, employees assess codified knowledge from the formal system and adapt it to their contextual needs before becoming 're-codified' per se in an iterative process based on knowledge integration

3.3.1 The relationship between *control over* and *control in situ*

Given the complex legislative landscape that sustainability entails, bureaucratic SCS design is indeed important for embedding extra-organisational conditions into action. It is commonly accepted by citizens and business actors that formal rules and regulations regarding sustainability management are necessary for sustainable futures by ensuring certain—and often ‘minimal’—performance outcomes are met. This, consequently, affects operations based on standardised knowledge that originates from the extra-organisational context, but is not inevitably received negatively as A&B originally propose. Nevertheless, sustainability legislative disturbances are often not legally binding and are frequently deliberately kept broad to apply to all organisations irrespective of size, sector or context. Therefore, such external pressures may also facilitate *control in situ*. This is because organisational actors are often left to interpret the overarching legislative environment through ‘experimentation’, giving rise to an array of implementation and configuration patterns for SCS (see Yin and Schmeidler 2009).

Sustainability MAC issues bridge field and organisational levels. Here, sustainability *management* constitutes dual strategies based on knowledge and information sources that originate from the field in addition to the firm (see Burritt and Schaltegger 2010; Wijethilake et al. 2017). Management in this sense can be seen as reducing organisational flexibility via imposed ‘control’ borne from the external environment. Alternatively, it can be seen as a flexible strategy founded upon building internal knowledge through trial and error that filters out through, for example, sustainability governance workgroups (Johnstone 2019). Therefore, the dual role of control for the development process of SCS need not be isolated to the intra-organisational environment as is commonly proposed in dominant MCS frameworks. Furthermore, applying A&B’s framework as an analytical tool requires not only the consideration of organisational objectives (i.e. transparencies in the conventional sense), but also wider extra-organisational contextual factors (i.e. external transparencies). Such broader conceptualisations of transparency (i.e. situational knowledge based on local context) are necessary given that organisational actors are becoming increasingly familiar with new modes of governance for addressing sustainability issues. To this end, “decisions made by individuals, civil society, and the state involve questions of economic efficiency, environmental effectiveness, equity, and political legitimacy” (Adger et al. 2003). This has broader implications for theoretical conceptualisations of SCS, as well as bridges managerial and critical viewpoints.

As emphasised, the relationship between formalised SCS and their use is iterative where feedback and feed-forward loops (see Dekker 2016) permit operations to be adjusted in light of experience and knowledge over time. To explicate, the traditional perspective on accounting as a social practice assumes that the formalised systems are received, interpreted and communicated by the general employees as system users to equate action. Upon receiving instructions (e.g. through a Code of Conduct), these employees hold some power in the actual use of accounting tools. To this end, Chua and Mahama (2007, 78) recognise that accounting “construct[s] social identities that in turn come to be linked with the development of different social accounting metrics” (see also Goretzki et al. 2017). This usefully illustrates

the inherent problem when conceptualising systems either based on design or use in research, especially for meeting sustainability goals which are often rolling (e.g. ISO 14,001). Moreover, it infers the combination of managerial and critical stances in the sense that designing sustainability accounting systems in such a way for performance outcomes to be met is highly contingent on sociological processes. However, controlling sustainability outcomes in the intra-organisational context based solely on formalised system design is unfeasible as organisational actors can also offer value to the development process of SCS borne from individual values reflective of broader societal trends. To this end, formally embracing the individual-level phenomenon of the process characteristics through SCS design can incite more committed employees in task performance which feeds back into future strategic design.

3.3.2 Theoretical development

A&B's framework is founded upon the attitudinal perceptions of system users. However, as stated, these attitudes have conventionally been treated as an outcome, rather than precursor to system success. Thus, there is the need to develop the framework in order to incorporate individual characteristics as inputs to the system, borne from both organisational and external contexts. As indicated, a positive attitude towards task performance may be the result of some external stimuli that is not accounted for in discussions of the system. For example, Chapman and Kihn (2009) note that managerial perceptions may be positive even if performance outcomes are not met. And, system success necessitates more than just attitude; it requires the alignment of both a professional mind-set and competence (see Henttu-Aho 2016). This suggests that bureaucratic formalisation (whether coercive or enabling) is something more than the system characteristics and development process. Therefore, this paper develops A&B's original framework by arguing that paying more attention to the process characteristics embodied by the individual user (whether manager or general employee) will yield more effective performance results for long-term sustainability, which are not confined to the organisational level of analysis. The guiding premise here is that the process characteristics can help moderate SCS success based on performance outcomes (Baird et al. 2017). Yet, these process characteristics are not merely the product of formalised system design as originally inferred. They are also the result of extra-organisational values and experiences brought with the individual employee to the workplace. Thus, theorising *control in situ* recognises the iteration between system design and use, which affects and is affected by employees over time and space. This also extends the notion of accounting as a social practice as more than merely the result of employees making sense of organisational values embedded into the formal system.

Heggen et al. (2018, 20) usefully illustrate the relationship between the dual role of control for sustainability when using A&B's framework to explain their findings. These are presently the only authors who use the framework for sustainability MAC research. The authors comment that "social control processes are complemented by a formal beliefs system" to ensure a common 'environmental vision' (see also Arjaliès and Mundy 2013; Rodrigue et al. 2013). By emphasising that environmental accountability is the responsibility of all organisational actors beyond managerial

tiers, Heggen et al. (2018) also provide support for developing the process characteristics as a means to both integrate and institutionalise a sustainability rationale which is dependent on actor participation and expertise from the outset. Their findings highlight the potential of key people in influencing the integration of sustainability issues into existing MCS. Indeed, much research in corporate sustainability is orientated towards “methods, processes and specific outcomes” (Schaltegger 2017, 5), however more attention should be given to what Englund and Gerdin (2015) term ‘operational knowledge’, embodied in the individual employees. This may be borne from the design of enabling organisational systems, or the product of some external stimulus. For example, Groen et al. (2012) pose that social participation in the ‘development of performance measures’ informs attitude that precludes action. The authors state that tacit knowledge exchange improves not only social bonds, but also competence levels in an open work environment that fosters communication. Therefore, general employee involvement from the outset (i.e. participation and experimentation) can also be considered positive for knowledge integration (Ditillo 2004) and transparency (Wouters and Roijmans 2011), as well as the development of sustainability competences and commitment (see Heggen et al. 2018). This reflects recent discussions within the sustainability stream regarding the move from accounting to accountability, or governmentality to governance; arguably bridging managerial and critical perspectives.

While experience and professionalism are viewed as important process characteristics in the reviewed research, there is also the underlying assumption that competence is necessitated by the employees in order to improve system processes and outcomes. Indeed, experience in working with sustainability targets and measures improves the potential of sustainability knowledge, although sustainability *competence* ultimately strengthens this; i.e. the user needs more than just experience. Moreover, professionalism and experience infer competence, although someone can appear professional in what they do, yet lack competence in it. Similarly, experience or experimentation working with something should improve knowledge (i.e. transparency), but does not necessarily equate to competence in the action. Therefore, the additional process characteristic of *sustainability competence* for the development process of SCS is hereby proposed, in addition to experience, experimentation, professionalism and transparency. This refers “to one’s ability to respond to a sustainability challenge [in situ]” based on sustainability as a whole (Wals 2010, 386). It involves forward-thinking, the ability to cope with uncertainty, teamwork, participation, planning and implementation, among others (see de Haan 2006). In this sense, it relates to A&B’s notions of repair based on the wider ‘extra-organisational’ transparencies. For sustainability as a general discourse rather than an accounting phenomenon, it could also prove particularly useful for internalising the sustainability plight that transcends from beyond the workplace in the individuals’ values. To this end, not only competence in task, but also sustainability competence, is proposed as evolving over time based on the experience gained in the experimentation process (see Mahama and Cheng 2012; Henttu-Aho 2016).

Thus, in order to increase the potential that sustainable performance outcomes are met, theoretically expounding upon the process characteristics can offer a more complete understanding of the development process of SCS. This is founded upon

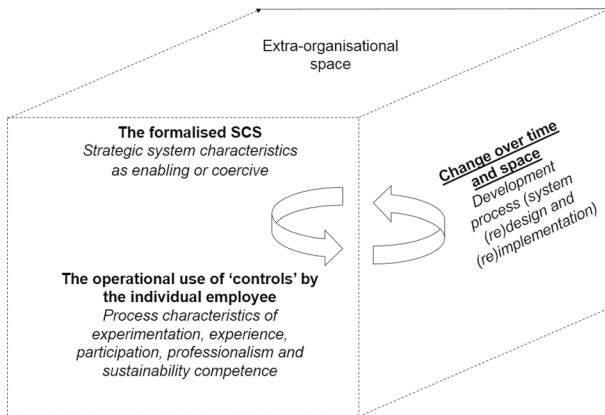


Fig. 2 Expanded conceptualisations of Adler and Borys' (1996) theoretical framework for the SCS

the individual general employee as system user, as well as the formalised system design by top management. As an overview, Fig. 2 builds upon the expanded conceptualisation of the SCS with regard to A&B's theoretical framework. It emphasises the paramount role of the operational users as an intermediary layer for the development process of the SCS over time and space. Hence, the expanded framework helps draw out the nuances of the 'individual' process characteristics for sustainable futures that extend beyond the firm, as well as serve as a baseline for future sustainability MAC research.

3.3.3 Conceptual development

Developing conceptualisations of the process characteristics proposes that the relationship between the system characteristics and development process is extended to include the system user as *the* intermediary layer, or even *the* foundation to system success. Particularly, experience, professionalism, experimentation, transparency and sustainability competence link to social control in the sense that they are embodied by the individual employee—through both formal system design and history—who has the capacity to use such characteristics in order to improve internal—and consequently external—sustainability systems. Nevertheless, overtly proposing the individual as a social control mechanism essential for sustainability management is rarely theoretical explicated. Consequently, building upon the process characteristics is here proposed central to the developmental process of SCS in order to mitigate the dangers of standardised systems (Wouters and Wilderom 2008) which may be received as constraining. It is also important to the sustainability discourse in general.

As indicated, social control rests in the individual and occupies the behavioural dimension of MCS as a socio-ideological construct (Bedford and Malmi 2015). However, much discussion of corporate sustainability within MAC research is orientated towards organisational values and levels of analyses. As such, the broader category of socio-ideological control (see Bedford and Malmi 2015 for an overview) is often taken at the group level (i.e. the aggregate of individuals). This, consequently,

neglects conceptualisations and theorisations on the role of the individual as a change agent (see Sharma 2002). Indeed, some may argue that individuals have “difficulties in looking past their self-interests” to support organisational objectives (Cardinal et al. 2017, 559). However, as sustainability increasingly becomes the interest of all (governments, organisations and society), sustainability MAC presents a unique case. Thus, theoretically building upon the process characteristics can highlight that individual values and norms (i.e. social control) can also positively affect organisational performance which has organisational, personal and generational outcomes.

3.3.3.1 Social control for effective sustainability management Social control is defined here as the norms and values, borne from both the organisational and the individual’s context, which guide employees in their daily work. It is therefore applicable to developing conceptualisations of *control in situ* as individual employees build competences from the inside-out, having autonomy from the group which can also transcend into their daily lives beyond the organisational boundaries. It regards building sustainability knowledge, competence and commitment through communication, dialogue, education and training (Johnstone 2018). Thus, it also incites feelings of responsibility and accountability for sustainable futures (see Heggen et al. 2018) as well as relates to experience and experimentation within the firm which may also boost sustainability professionalism and competence (see Wouters and Wilderom 2008). Consequently, developing the concept of social control for the development process of not only SCS but also sustainability in general, assumes it a position which bridges theory and practice, with additional broader societal effects. It also suggests that the theoretical demarcation of social control within extant MAC literature regarding its position to the system perhaps requires less attention; that is, embracing social control as *control in situ* at a given point of analytical time does not necessarily mean that the concept is resigned to the firm’s boundaries or temporal scope.

As described, social control assumes a central locus of control that resides within the individual organisational actor (see Rotter 1966). Further, the properties of this control may—or may not—be the result of a formalised SCS, making it difficult to analytically separate intrinsic sustainability values from extrinsic organisational strategic values. Therefore, social control occupies past, present and future dimensions which are difficult to theoretically and analytically capture in the construction of the SCS, although important to recognise. Nevertheless, deliberately employed boundary spanners can be used as a strategy (or a control mechanism) based on organisational structure to promote performance outcomes and develop the SCS over time and space in response to context. For example, Wouters and Wilderom’s (2008) present an ‘established group of champions’, deliberately composed of with “one person from each department within the company who was the most enthusiastic proponent of performance measurement ... leading departmental initiatives to develop [this] further” (2008, 507). However, as previously indicated, boundary spanners may also be motivated to achieve performance goals due to internal values and norms that are the product of their individual histories. These sources of motivation are not mutually exclusive, although occupying a position as a boundary spanner is likely indicative of experience and professionalism in addition to sustainability competence. Such a control mechanism is enacted by the organisational structure, yet not resigned to its

borders. Effectively, the point made here is that boundary spanners can be adopted as strategic control mechanisms through formalised system design as well as unintended strategy. Specifically, even if the employee takes it upon his/herself to become a boundary spanner in relation to the development process of the SCS, this is most likely 'formally' recognised within the organisation in some shape or form.

Consequently, expounding upon social control as an individual-level phenomenon highlights the interconnectedness between discrete SCS design and operational use as part of a broader corporate sustainability strategy through key individuals on the 'floor'. Therefore, while social control rests at the level of the individual operator based on both organisational and individual values, the boundary spanner can be viewed as a manifestation of social control to ensure more effective and efficient SCS; i.e. as a management control tool. The establishment of boundary spanners, however, can be either the product of formal system design and/or personal motivations.

3.4 Summative model

The previous discussion has highlighted that more attention to the individual employee is required for the development process of the SCS. To this end, A&B's expanded theoretical framework is posed as a useful analytical tool to link strategic and operational perspectives over time and space by building on the process characteristics of the individual employee. Specifically, it is the general employees who moderate the link between control and performance (see Baird et al. 2017). Here, both the system (*control over*) and its reception and use by the user (*control in situ*) are central to the development process of a SCS over time and space.

Conceptually developing theorisations of the binary relationship between SCS design and use (i.e. the dual role of control) entails building on understandings of the individual as an intermediary layer. Employees embedded within a local context are necessary for sustainable futures, bringing with them distinct characteristics and values which affect the development process of the SCS. Yet, extant MCS frameworks tend to reduce the importance of these extra-organisational dimensions for improved corporate performance. This is perhaps due to the conceptual difficulty in capturing these multifaceted phenomena where the system is in dynamic interaction with its context. However, as sustainability discourse is something broader than the organisation, it requires expanded theoretical perspectives in order to explain the development process of SCS. As such, the process characteristics of the individual employee (through the broader concept of social control) require recognition in formal SCS design and academic theorisations of the SCS. To this end, firms can often appoint key individuals (i.e. boundary spanners) to ensure sustainability performance outcomes are met in a given context, emphasising accountability frameworks through organisational structure in addition to performance metrics. In this sense, the broader strategic aim of corporate sustainability does not necessarily contradict the idea of localised sustainability systems.

Overall, building upon A&B's framework is useful as it recognises that systems can be designed to enable employees to contribute to the future development process of SCS over time and space. This may be achieved through a flexible design which

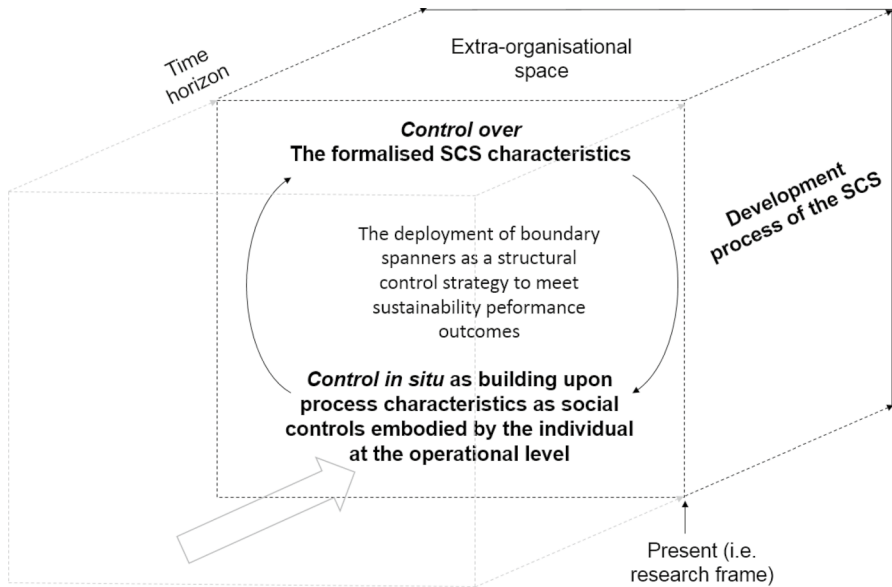


Fig. 3 Summative conceptual model of the SCS based on the broad control typologies (i.e. the dual role of control)

promotes building the process characteristics, conceptually captured as social control in the sense that systems can be designed to promote sustainability knowledge, competence and commitment through formal or informal communication or education structures (Johnstone 2018). Nevertheless, the SCS as a theoretical construct exists in temporal and spatial dimensions. This means that such process characteristics are not necessarily merely ‘created’ in the formal system design, but are also built upon and developed through it. Specifically, individuals bring with them various experiences and values which are a product of their discrete histories. These external dimensions may also prove fruitful for the development process of the SCS, which increasingly recognises the importance attached to the individual employee. As an overview, and building on the previous models, Fig. 3 summarises the connection between the theoretical framework and concepts for the development process of the SCS. Arguably, a comprehensive model is needed that captures the multiple concepts that help explain the nature of control in sustainability MAC research. As such, this figure is intended as a summative conceptual model to frame future theorisations of the SCS.

4 Concluding discussion

This conceptual paper sought to address how the development process of SCS could be understood by combining the dual role of control based on system design (i.e. *control over*) and use (i.e. *control in situ* by the system user). As such, its intent was not to detail configurations of control, but rather to suggest the necessity of looking at the broader nature of control for future sustainability MAC research. In this

sense, it is unique in that most studies within MAC research tend to focus *either* on system design *or* use, which can be considered limited for the sustainability field that necessitates the continual (re)design of SCS in accordance with an evolutionary regulative environment. Consequently, theorisations of the SCS require broader conceptualisations and analytical frames to fully capture the development process of the system in a particular context. While these frameworks may be complex, they are deemed necessary to more holistically capture the dynamics of the SCS.

The paper finds that the development process of a SCS rests not only in controls embedded within system design but also the system users. However, system use is not only affected by organisational values, but also extra-organisational dimensions that form the individual employee's sustainability values. In this sense, it suggests that typical frameworks require expansion to embrace 'sustainability management' in a broader sense by enabling employees. Particularly, it suggests that studies into sustainability accounting as a social practice require theoretical perspectives that recognise that actors are not only affected by organisational values, but also individual ones which stem from a broader societal perspective. Together, both intra and extra-organisational dimensions constitute the individual's likelihood to act sustainably. This expanded viewpoint within sustainability MAC research is deemed necessary to inform long-term sustainable futures. By building on the competences of individual employees at the operational level, there is the potential for sustainability 'performance' outcomes to transcend organisational and generational boundaries. Thus, the paper emphasises a critical approach which recognises governance, accountability and responsibility structures in the design of SCS, in addition to conventional managerialist assumptions based on hierarchical control. This is because SCS are products of increasingly complicated multi-level governance architectures where standardised systems are inadequate for 'local' sustainability concerns.

In order to theoretically understand the development process of SCS, the paper suggests that more research attention should be paid to the relationship between *control over* regarding the system design characteristics and its use *in situ*. To this end, Adler and Borys' (1996) expanded framework of enabling and coercive formalisation is offered as a useful analytical tool to frame future SCS research based on the 'dual role of control'. Although this framework was conceptualised as functionalistic—or managerialist—in the sense that formally designed systems have certain behavioural or attitudinal effects on the system user, the 'social' process characteristics of experience, professionalism, experimentation, transparency (Wouters and Wilderom 2008) and sustainability competence are later introduced. These are viewed as influencing the system's development process. Consequently, a social constructivist perspective becomes evident.⁴ As such, this conceptual paper expands Adler and Borys' original framework by proposing an intermediary layer through the individual that connects SCS design and its use over time and space.

The developed theoretical framework recognises the merits of both managerial and critical positions in relation to sustainability control. It also connects perspectives on system characteristics, performance outcomes and individual corporate actors.

⁴ Note, however, is not the view of Wouters and Wilderom (2008) who assert that the process characteristics are the product of a formal enabling system design. In this sense, they somewhat neglect that the process characteristics may be also be borne from the extra-organisational context.

Recently, attention to the individual employee has been increasing both in research and practice. Human actors are also central to the critical social and environmental accounting stream. However, presenting the micro-level *individual* employees—the system's operational users—as linchpins to the development process of SCS is often not overt in extant MCS frameworks. Further still, many empirical studies concentrate on managers or the relationships between managers and controllers, rather than on the utility of operators as embodying professional, social and environmental competences. In this sense, the expanded framework can offer more enlightened research about the actual MAC social practices that occur in the development process of SCS, rather than relying on functionalist frameworks that do not necessarily capture the dynamics and necessity of individual actors that sustainability entails.

Overall, this paper argues that for true sustainable outcomes to be met, more attention should be given to the individual general employee in control frameworks. To this end, social control is reconceptualised as an individual-level phenomenon where the process characteristics of experimentation, experience, professionalism and transparency, in addition to sustainability competence, facilitate the development process of the SCS in a given context. These characteristics arguably give rise to increasingly motivated employees that engage in the sustainability agenda. They also reside at a position that bridges both elements of *control over* (i.e. developing the process characteristics embedded into formalised system design) and *control in situ* (i.e. the process characteristics as the product of attitudinal understandings of system design as well as the intrinsic motivations to act at the operational level). Thus, in order to better understand the relationship between the system and its use, future studies into SCS should embrace the position that a degree of control also rests within individual corporate actors. Yet, this control is not only a manifestation of how operators interpret the overarching control system, it is also the product of extra-organisational values; i.e. transparencies that are broader than the firm. Social control also may be deployed as a strategy via boundary spanners as active sustainability coordination mechanisms. This not only has theoretical implications by increasing understandings of the dual role of control, but also practical implications across spatial and generational horizons.

Indeed, addressing the behaviour of individuals may be critiqued by some as moving into organisational studies. Yet, socio-ideological controls are gaining more attention (whether subtly or overtly) in MAC research. As such, applying the proposed framework in the sustainability MAC field allows for the consolidation of the 'tensions' that sustainability control entails; that is, sustainability is the responsibility of the government, society and the firm. Therefore, recognising an extra-organisational dimension when theorising the SCS is necessary. Here, the individual is key. As such, drawing out the potential of the process characteristics in future conceptualisations and theorisations is necessary for improved performance outcomes that extend beyond the firm's borders. Namely, this assumes that systems designed to develop such characteristics can improve overall corporate sustainability performance. Concurrently, it posits that the permission scope to act on such design parameters also rests within the individual employee and is not solely an organisational-level phenomenon, transcending organisational and generational confines. This not only has theoretical implications regarding understandings of the dual role of control, but also practical implications that extend beyond the firm.

The paper contributes to research by placing more emphasis on sustainability MAC as a social practice that necessitates greater recognition of the ability, motivations and perspectives of the individual general employees in addition to context. To this end, it expounds upon the notion of accounting as a social practice. Specifically, it offers Adler and Borys' (1996) framework as an analytical tool which was arguably originally conceptualised as *control over* to develop understandings of operational *control in situ*. By building on the process characteristics as the intermediary level that bridges system design and use, it extends conceptualisations of the role of the individual system user for sustainability performance. Therefore, the paper not only contributes to the growing literature on enabling and coercive control, it also contributes to sustainability MAC by offering an expanded theoretical framework to explore the development process of the SCS. By improving understandings of system users, it may be possible to facilitate the development process of SCS both in practice and theory. This is perhaps even more essential for the sustainability discourse because it transcends organisational boundaries. Managerially, it contributes by illustrating the necessity of developing the general employees' process characteristics to ensure sustainable performance outcomes are met, as well as extend beyond the firm over time and space as the sustainability discourse becomes internalised. This can encourage managers to think about how systems are received from the perspective of their users to encourage more commitment from the outset.

Nevertheless, for true sustainability outcomes to be met, future research necessitates building theorisations of the development process of SCS in particular contexts based on the dual role of control (i.e. between *control over* and *control in situ*). Especially, more conceptual and empirical research is needed to improve understandings of the connection between the individual, the system and performance outcomes for the development process of SCS in a given environment. In this sense, there remains the need for a holistic approach in the study of SCS that embraces the complexity that sustainability entails. While this may be critiqued as embracing multiple concepts and philosophical positions, the sustainability discourse is indeed complex to capture in extant models that dominate MAC research. Thus, new theorisations are needed specific to the sustainability stream. This is needed not only to bridge the extant conceptual and theoretical divide between system design and use within MAC research, but also to inform sustainable futures that extend beyond the firm. Therefore, future empirical studies could apply this extended framework as an analytical tool. Specifically, more attention is required on how the process characteristics (which rest as both the product of the system and the user) can positively affect the development process of SCS, as well as inform future sustainability strategies and lifestyles. To this end, the developed understanding of social control as resting on both organisational and individual values for effective sustainability management is posed as a useful start-point for researchers and practitioners alike. This is because the individual is vital to the success of SCS in general, but particularly effective in the internalisation and integration of social and environmental sustainability concerns over time and space.

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Compliance with ethical standards

Conflict of interest The author declares no conflict of interest.

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