Long Range Planning 53 (2020) 101928

Contents lists available at ScienceDirect

Long Range Planning

journal homepage: www.elsevier.com/locate/lrp

Now, switch! Individuals' responses to imposed switches between exploration and exploitation

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ARTICLE INFO

Keywords:
Individual ambidexterity
Switching
Resistance
Emotion
Cognition
Exploitation
Exploration

ABSTRACT

Individual ambidexterity is an important micro-foundation of organizational ambidexterity. However, switching back-and-forth between exploration and exploitation can be challenging for individuals. Prior research has mostly focused on bottom-up approaches to stimulating individual ambidexterity, yet many organizations are characterized by greater top-down control. Exercising control may complicate the pursuit of individual ambidexterity because it amplifies switching resistance. We draw on an observational study of facilitated strategy workshops to explore the role of switching resistance and steps that can be taken to deal with it in top-down settings. Our findings suggest that imposing switches on individuals tends to trigger a distinct pattern of behavioral responses. Furthermore, we find that increasing control and offering emotional support can reduce switching resistance and help individuals execute ambidextrous work tasks. Our study contributes to the literature on individual ambidexterity by extending it from bottom-up to top-down settings. Specifically, we identify emotional, cognitive and behavioral drivers of switching resistance and unpack the process leading up to resistance. Furthermore, we identify organizational measures relevant for addressing such resistance and resolving ambidexterity at the individual level.

Introduction

Scholars have recognized that individual ambidexterity is an important micro-foundation of organizational ambidexterity (Gibson and Birkinshaw, 2004; Raisch and Zimmermann, 2017; Tempelaar and Rosenkranz, 2019). For individuals, however, managing the tension between exploration and exploitation can be difficult (Gupta et al., 2006; Papachroni et al., 2016; Smith and Tushman, 2005). The question of how to best support ambidextrous behavior in individuals therefore remains highly relevant for researchers and practitioners alike.

Extant literature has largely assumed a bottom-up approach to individual ambidexterity, where individuals are supported in making their own informed choices about how to divide their time between exploration and exploitation (Adler et al., 1999; Gibson and Birkinshaw, 2004; Kauppila and Tempelaar, 2016; Mom et al., 2015; Tempelaar and Rosenkranz, 2019). In contrast, studies have to date paid limited attention to how individual ambidexterity can be ensured in settings where organization members have less autonomy on such choices. This seems surprising, given many workplace contexts are characterized by standardized procedures and behavioral expectations that constrain individuals' choices on how to spend their time (Gioia and Poole, 1984).

As observed by Raisch and Zimmermann (2017), top-down approaches to ambidexterity have thus far largely been associated

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https://doi.org/10.1016/j.lrp.2019.101928
Received 20 January 2018; Received in revised form 9 October 2019; Accepted 25 October 2019
Available online 31 October 2019
0024-6301/

with the organizational level of analysis (e.g. Jansen et al., 2012; O'Reilly and Tushman, 2004). However, a more directive approach to determine when individuals should explore and exploit may also be relevant within business units or teams. For example, senior managers might need to ensure a common pace or direction for ambidextrous work (Jansen et al., 2008; Tempelaar and Rosenkranz, 2019). Moreover, research has shown that individuals differ substantially in their natural talent for ambidexterity, meaning that some are likely to require more guidance than others to effectively balance exploration and exploitation (e.g. Kauppila and Tempelaar, 2016; Laureiro-Martínez et al., 2015; Tempelaar and Rosenkranz, 2019). A focus on bottom-up solutions, in which individuals are left to deal with explore-exploit tensions on their own, may therefore exclude many organization members from contributing to ambidexterity. To expand the theoretical boundaries and practical relevance of ambidexterity research, an empirical investigation of how individuals execute ambidextrous work in top-down directed settings thus seems relevant.

With this in mind, we go on to ask the following question: *How do individuals respond when they meet strong behavioral expectations on when to explore, when to exploit, and when to switch between these two activities?* In line with calls for more observational and process-focused research (Keller and Weibler, 2014; Smith and Lewis, 2011; Tempelaar and Rosenkranz, 2019), we use facilitated strategy workshops as a setting to study how individuals react when required to switch back-and-forth between exploration and exploitation at specific points in time. Based on our findings, we outline the distinct emotional, cognitive, and behavioral[1] aspects of the response pattern to switching requests. Informed by insights from literatures on task switching (Koch et al., 2010; Leroy, 2009) and metacognition (Gangemi et al., 2015; Thompson et al., 2011; Thompson and Morsanyi, 2012) we propose a model of the process leading up to switching resistance. We supplement the model with illustrative vignettes that showcase (i) how switching resistance unfolded in our workshop context and (ii) episodes where switching resistance was overcome.

Our study makes two main contributions to the individual ambidexterity literature: First, it draws attention to switching as a *process* that unfolds at the level of specific work tasks and activities. Rooted in observations of workshop participants' responses to switching requests, we outline the behavioral drivers of switching resistance and detail how they interrelate. More specifically, we find that requirements to switch can spur negative emotions, such as feeling stressed or dissatisfied, and can also trigger specific decision-making tendencies, such as seeking or avoiding closure. Such emotional and cognitive responses can subsequently lead to resistive behavior, such as ignoring or trying to postpone switching requests. Our detailed explanation of these responses goes beyond the general recognition in the literature that dealing with explore-exploit tensions can lead to discomfort and stress in individuals (e.g., Gibson and Birkinshaw, 2004; Raisch and Zimmermann, 2017) and complements prior experimental and survey-based work (Laureiro-Martínez et al., 2015; Tempelaar and Rosenkranz, 2019) by highlighting the process that leads up to switching resistance.

Second, our study identifies organizational measures that can be used to address switching resistance and enable individuals to execute ambidextrous work. More specifically, our findings suggest that an increase in top-down control, coupled with the provision of close guidance to individuals throughout the switching process, can help overcome switching resistance in settings where individuals have less autonomy. Our study thus adds to recent insights about the role of support versus control for individual ambidexterity (Bonesso et al., 2014; Havermans et al., 2015; Tempelaar and Rosenkranz, 2019) by suggesting that, on the level of specific work tasks, individual ambidexterity can be effectively achieved through a combination of structural control and contextual support. From a practical standpoint, the study thus offers implications for organizations wishing to reduce switching resistance and promote individual ambidexterity.

Theoretical background

Individual ambidexterity and switching

Ambidexterity research rests on the central thesis that balancing exploitation and exploration is necessary for organizations to survive and prosper (He and Wong, 2004; Hill and Birkinshaw, 2014; Jansen et al., 2012; Raisch et al., 2009; Tushman and O'Reilly, 1996). Recent work suggests that the ability to balance exploration and exploitation may not only be crucial at the level of a firm or business unit, but also at the level of an individual member of any organization. Researchers have, for instance, shown that the way individuals embrace tensions (Andriopoulos and Lewis, 2009; Papachroni et al., 2016) or take explore-exploit decisions (Smith and Tushman, 2005) are important drivers of organizational ambidexterity.

Acknowledging the relevance of individual ambidexterity, however, raises the question of how exploration and exploitation can be balanced at the individual level, and whether this equilibrium can be better reached through their simultaneous pursuit or through alternation between them. While some scholars have questioned whether tasks can be split in a way that allows individuals to focus solely on exploration or exploitation (Farjoun, 2010; Rosing and Zacher, 2017), others have indicated that simultaneous pursuit of exploration and exploitation may be impossible for individuals at any one point in time (Gupta et al., 2006; Laureiro-Martínez et al., 2015). This suggests that some degree of switching needs to take place. In his seminal work, March (1991) introduced exploration as "*things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation*", and exploitation as "*such things as refinement, choice, production, efficiency, selection, implementation, execution*" (March, 1991: 71). These definitions help to clarify that, at the level of specific tasks and activities, exploration and exploitation impose different cognitive demands on individuals; Activities associated with exploration require divergent thinking, while activities associated with exploitation require

[1] In this paper, we use the term "behavioral" to distinguish individuals' actions (or lack thereof) from the emotions and cognitions they display in response to switching requests. We refer to the entirety of emotional, cognitive, and behavioral aspects as "behavioral drivers" of switching resistance.

focused attention (Good and Michel, 2013). Because it is difficult to be cognitively engaged in both at a certain point in time, ambidexterity at the individual level is thus likely to be enacted as a form of temporal separation (Gupta et al., 2006). Specifically, individuals will likely resort to switching back and forth between explorative and exploitative activities to achieve a balance between them over time (e.g. Tempelaar and Rosenkranz, 2019).

This switching, however, is complicated by *switching resistance*. Extant literature describes that such resistance manifests through a behavioral tendency to prioritize either exploration or exploitation. This tendency has been attributed to the self-reinforcing nature of exploration and exploitation (March, 1991; 1996), as well as differences in individual preferences and skills that make some more likely to engage more in either exploration or exploitation (e.g. Bonesso et al., 2014; Kauppila and Tempelaar, 2016; Tempelaar and Rosenkranz, 2019).

In addition to acknowledging that switching resistance can complicate the execution of individual ambidexterity, recent work has started detailing emotional and cognitive aspects that make switching between exploration and exploitation difficult for individuals. Emotional aspects herein relate, in the broadest sense, to socially broadcasted feelings and expressions of internal states (Dixon, 2012; Kleinginna and Kleinginna, 1981). Scholars have long acknowledged that dealing with the tensions connected to exploration and exploitation can trigger negative emotional effects in individuals such as stress (Raisch and Zimmermann, 2017), overload (Tempelaar and Rosenkranz, 2019), or a feeling of being stuck (e.g. Lüscher and Lewis, 2008; Smith and Berg, 1987). More specifically, with regard to the process of switching between exploration and exploitation, extant work suggests that negative emotions can arise in an individual due to (i) a perceived uncertainty associated with leaving the familiar path of exploitation (Laureiro-Martínez et al., 2015), (ii) an experienced difficulty of attending to both exploration and exploitation (e.g. Tempelaar and Rosenkranz, 2019), and (iii) tensions associated with the feeling of having to choose one activity over the other (Andriopoulos and Lewis, 2009; Papachroni et al., 2016; Raisch and Zimmermann, 2017; Miron-Spektor et al., 2018; Smith and Lewis, 2011).

Cognitive aspects relate to patterns of information-processing, thinking, and decision-making (Forgas, 2004; Sun, 2012). Ambidexterity scholars have generally related the ability to behave ambidextrously with the capacity for switching between different "thought worlds" (Raisch et al., 2009: 687; Inkpen and Tsang, 2005). With regard to the process of switching between exploration and exploitation, studies have investigated, for instance, the way individuals direct their attention when they consider explorative or exploitative decision alternatives. In an exceptional lab study on the neuro-psychological foundations of ambidexterity, Laureiro-Martínez et al. (2015) established a link between attentional control and the ability to effectively switch from exploitation to exploration. Their study tells us that, in order to switch from exploitation to exploration, individuals must invest cognitive effort in redirecting their attention.

The notion that switching can be a cognitively demanding process for individuals is further supported beyond the boundaries of ambidexterity research. In the domain of cognitive psychology, for instance, work focused on *task switching* suggests that switching between different tasks is difficult for individuals because their attention tends to get 'drawn back' to a previous task (Leroy, 2009; Koch et al., 2010; Rubinstein et al., 2001). To avoid switching resistance, *task inhibition* must occur (Koch et al., 2010; Leroy, 2009), meaning that individuals must dedicate attentional effort to prioritizing the new task while suppressing cognitions about the previous one.

It should be acknowledged that emotional and cognitive aspects, although introduced separately here, are generally known to interact (Hodgkinson and Healey, 2011; Dolan, 2002). In broad terms, individual judgments can be guided by affective responses as well as more general metacognitive feelings about what seems right or wrong (Thompson and Morsanyi, 2012). Individuals' resistive behavior, therefore, can be explained as a mix of emotional and cognitive, as well as action-oriented, factors (e.g. Oreg et al., 2018; Frijda, 1993; Moors et al., 2013). The ambidexterity literature, however, has yet to articulate how these factors interrelate to produce switching resistance.

Bottom-up versus top-down approaches to individual ambidexterity

A large and growing body of literature has investigated the organizational measures that can support individuals in accomplishing ambidexterity. Examples include factors such as the leadership style (Keller and Weibler, 2014; Havermans et al., 2015), behavioral expectations (Bonesso et al., 2014), or the networks (Rogan and Mors, 2014) individuals are exposed to at work. The basic assumption underpinning this line of research is that individual ambidexterity is best enabled by a supportive bottom-up approach. Specifically, Gibson and Birkinshaw (2004) suggested in their seminal article on contextual ambidexterity that organization members should be empowered to take their own informed decisions about how to divide their time between exploration and exploitation. In other words, individuals should be enabled to switch between exploration and exploitation at their own pace, and according to their own preferences. The key organizational measure to reduce individual switching resistance, then, is ensuring a supportive, rather than directive, organizational context (Adler et al., 1999; Gibson and Birkinshaw, 2004).

Subsequent work on individual ambidexterity appears to have implicitly built on the bottom-up approach (e.g. Kauppila and Tempelaar, 2016; Mom et al., 2015; Tempelaar and Rosenkranz, 2019). For instance, Tempelaar and Rosenkranz (2019) used a survey-based research design to study the extent to which account managers carried out ambidextrous work. The authors inquired into the managers' dedication to exploration and exploitation, seemingly assuming that respondents had the autonomy to decide on their own when and how much time to spend on the two activities.[2] Respondents were classified into role integrators, meaning

[2] The prevalence of such assumptions in research on individual ambidexterity may stem from the tendency to measure ambidexterity across larger time spans (Kauppila and Tempelaar, 2016; Mom et al., 2007, 2009; Simsek, 2009). For example, the scale for exploratory and exploitative behavior introduced by Mom et al. (2007), which is also employed by Tempelaar and Rosenkranz (2019), asks individuals about their activities during an entire year.

individuals who can easily cope with different role demands, and role segmenters, individuals who do not find this so easy. The authors' results suggested that the former group in particular might suffer stress-related consequences unless allowed to switch between exploration and exploitation at their own pace (Tempelaar and Rosenkranz, 2019).

Enabling individuals to work ambidextrously by granting them autonomy, however, may not always be possible for organizations. One reason is that most work contexts will put some boundaries and expectations on individuals when it comes to how they spend their time. Much of organizational life is *scripted*, meaning that *"people […] execute their tasks most of the time by following a set of skills, responsibilities, and rules that define their role"* (March, 1994: 60–61). The term *scripted* here broadly refers to individuals facing behavioral expectations in a given situation, these ranging from explicit rules and codes of conduct to more implicit expectations signaled by superiors or peers (Gioia and Poole, 1984). While members of an organization may have some autonomy in how they generally fulfill their work tasks, carrying out a specific task or activity will nevertheless require them to adhere to a certain way of working, and thus constrain opportunities to freely divide their time between exploration and exploitation.

From the perspective of senior managers, moreover, a more directive approach to stimulating individual ambidexterity may be the preferred choice in order to secure a common direction of work. Another reason for reducing individuals' autonomy with respect to ambidexterity is that some organization members will struggle to effectively balance exploration and exploitation on their own (e.g. Kauppila and Tempelaar, 2016; Laureiro-Martínez et al., 2015; Tempelaar and Rosenkranz, 2019). For instance, individuals with a preference for exploitation are generally less likely to intuitively contribute to ambidexterity, but they may still do so when embedded in work contexts that provide them with clear guidelines and expose them to exploratory tasks (Tempelaar and Rosenkranz, 2019). In addition, even those individuals with a natural talent for ambidexterity may end up underinvesting in exploitation when left to roam freely (Jansen et al., 2008; Tempelaar and Rosenkranz, 2019: 1534).

While a more directive approach to determining when individuals should explore and exploit may at times be warranted, it also poses inherent risks. The outright instruction of individuals about when to explore and when to exploit may reinforce switching resistance and thus make ambidextrous work more demanding to execute. Literature on the well-established concept of *resistance to change* (Choi, 2011; Oreg et al., 2011; Rafferty et al., 2013), for instance, suggests that organization members are generally likely to be hostile to imposed changes. This resistance can partly be explained by a general aversion to novelty and the reluctance to give up a proven path, but also by individuals' aversion to loss of control (e.g., Oreg, 2003). Work in this domain has focused increasingly on the individual change recipient (e.g. Oreg et al., 2018; Piderit, 2000). It supports the observation that the way an individual responds to imposed change is driven by interconnected emotional, cognitive, and behavioral aspects.

Although their study did not focus on investigating resistance to imposed switches between exploration and exploitation, Tempelaar and Rosenkranz (2019) suggested that some individuals can start to feel overloaded and become stressed when managers take over the direction of their work. The literature on task switching also indicates that reducing autonomy may make an individual's letting go of cognitions directed towards a current task more difficult than if they are allowed to shift to the next task according to their own preference and at their own pace (Koch et al., 2010; Liefooghe et al., 2010; Mayr and Keele, 2000). However, some studies conducted outside the laboratory have called into question the external validity of these findings (Panepinto, 2010; Katidioti et al., 2016).

In summary, current literature acknowledges that switching resistance complicates the execution of individual ambidexterity, due to associated negative emotions such as stress and overload (e.g. Raisch and Zimmermann, 2017; Tempelaar and Rosenkranz, 2019), as well as cognitive challenges associated with focusing attention (e.g., Laureiro-Martínez et al., 2015). Yet scholars have called for more research to expand on the process that governs switching decisions (Laureiro-Martínez et al., 2015: 334). Furthering the understanding of how individuals pursue ambidexterity when their autonomy is restricted seems particularly relevant because such top-down conditions may further increase switching resistance and, in turn, deteriorate their ability to behave ambidextrously (Gibson and Birkinshaw, 2004; Raisch and Zimmermann, 2017). To better understand how ambidextrous work unfolds in settings characterized by top-down control, our study sets out to answer the following: *How do individuals respond when they meet strong behavioral expectations on when to explore, when to exploit, and when to switch between these two activities?*

Method

To address our research question, we required a setting that would allow us to (i) focus on situations where individuals were expected to execute switches between exploration and exploitation, and (ii) follow the response pattern unfolding around switching requests. While many work contexts may require individuals to behave ambidextrously, the behavioral expectations when to switch between exploration and exploitation might not always be easy to pinpoint and observe. To overcome this challenge, we chose to use facilitated strategy workshops as a research setting. Strategy workshops have become a common format to bring organization members together to generate ideas and facilitate discussion, but also to settle on alternatives and take decisions (e.g. Hodgkinson et al., 2006; Jarzabkowski et al., 2015). Thus, strategy workshops are likely to include activities related to search and experimentation as well as activities aimed at consolidation and choice and should allow observation of multiple switching situations within a relatively short period of time. Moreover, in workshops, expectations about when to execute which activity are explicitly articulated and imposed on organization members by means of a pre-planned script. Clearly defined, and thus observable, timeframes are provided to participants and further enforced by aids, materials, or facilitator interventions.

Our study follows an inductive and interpretive research paradigm, which aims to understand phenomena through considering the experiences of relevant participants (Gioia et al., 2013; Shah and Corley, 2006; Wicks and Freeman, 1998). Whereas survey-based and laboratory research is useful for uncovering individual factors that govern the switching process, observational methods are better suited for investigating their interplay. Workshops, as a setting that allowed us as researchers to immerse ourselves in the

middle of things, were thus a good fit for unpacking the switching process *as experienced* by individuals in the field (Garud et al., 2017).

Empirical setting

Projects. We leveraged the fact that both study authors were involved in a series of similar workshops belonging to *strategic foresight* projects in two industries. As is common for such projects, the two workshop series aimed at identifying factors that could drive industry-level change in the medium to long term, learning about the impact of potential future scenarios, and deriving actions to ensure the participating organizations' long-term competitiveness.[3] Studying two projects enabled us to spread our observations over time and across contexts. The first project (from now on project A) was set up at a small private organization in the professional services industry. The second project (from now on project B) was a collaboration between several private and public organizations operating in the maritime industry. The organizations in both contexts had been working in stable environments where incremental improvements to their existing product and service portfolio had been sufficient to compete for many years. For such organizations, a typical ambidexterity challenge is a bias towards exploitation (Raisch and Birkinshaw, 2008). Initiating a foresight project was thus a first step towards counteracting this bias and becoming more ambidextrous. Project A aimed at understanding the future of the professional services industry and had the objective of developing at least one new product or service idea. Similarly, project B aimed to understand trends in the maritime industry and develop ideas for new business models (see Appendix A).

Workshops. Each project included three core workshops. Workshop 1 was centered around discovering relevant trends in the organizations' environments, workshop 2 on assessing the impact of these trends, and workshop 3 at deriving suitable responses. For each workshop, a core group of 9–13 participants came together to work on a set of pre-defined activities. In project A, the participants were the employees of a small organization and their CEO, who had initiated the project. In project B, participants were representatives of ten organizations that had been invited by the project owner (a network facilitator). For half a day, these participants then engaged in pre-planned exercises to produce outcomes such as a key set of possible scenarios, future customer profiles, or action roadmaps. Each workshop was run by a facilitator. After a brief introduction and warm-up, the facilitator would typically ask participants to form smaller groups[4] and work on two or three bigger exercises, followed by plenary presentations and discussion of the results.

Workshop tasks. The tasks carried out by workshop participants typically connected exploratory and exploitative activities in a sequential manner. That is, to achieve the overall workshop outcome, it was necessary to switch back and forth. For example, participants were asked to explore new product ideas (*"Brainstorm different product ideas…")* and select one to exploit further (*"… and create an in-depth description for one idea."*). They were then asked to consolidate their ideas in the plenary and choose one (*"Vote for your favorite product idea…"*) to open up for search and exploration again (*"… and discuss what the implementation of this idea would require."*). It should be noted that anticipating switches between exploratory and exploitative activities requires some degree of conceptual bracketing because "*human thought and action are never solely explorative and exploitative*" (Bledow et al., 2009: 33). The ambidexterity literature generally defines novelty (such as in "exploration") as relative to the current or prior knowledge of an organization or individual. We also determined the exploratory or exploitative nature of a task in relation to the one which had preceded it: In the example given before, an activity such as creating a description for a new product idea could, if looked at in isolation, be interpreted as exploration because it involves divergent thinking and search. However, because the previous task had already required participants to consider multiple product ideas, the requirement to start creating a description for one of them, in that context, entailed focusing attention and consolidating results.

Data collection and role of researchers

Both study authors joined the projects' organizing team and stayed involved throughout the entire time; from crafting the initial project charter over planning and conducting to evaluating the workshops. We also helped in the workshops' facilitation; In project A, the first author assisted the primary facilitator (another researcher), while in project B, the second author assumed the role of the primary facilitator together with the project owner.

Taking on these roles was important for our study in two ways: first, it allowed us to have primary oversight over the research design (Chisholm and Elden, 1993). The detailed knowledge we gained about the workshops' agendas and exercises was crucial for pinpointing when switches between exploration and exploitation were supposed to happen. Secondly, it allowed us to experience and observe first-hand how participants dealt with switching requests. As facilitators, we did not slip into the role of a participant, but we were able to closely observe the subtle behavioral dynamics on display in switching situations.

Over the course of the projects, we collected a comprehensive data set consisting of documents such as project plans, agendas, workshop presentations, notes from meetings or phone calls, and emails sent within the organizing team. Appendix B provides an overview of our entire data set. Given our interest in participant behavior, our primary data source was the observations we made

[3] Foresight has been defined as "identifying, observing and interpreting factors that induce change, determining possible organization-specific implications, and triggering appropriate organizational responses". (Rohrbeck et al., 2015: 2).

[4] In neither of the projects were participants pre-assigned to groups. Typically, facilitators would only ask them to spread rather evenly in groups of 3–4 or, for some exercises, join a group they had (not) worked with in the previous exercise. Project owners, such as the CEO and/or managers who had been involved in planning the workshops, generally avoided joining the same group.

during the actual workshops (Thomas et al., 2011; Tsoukas, 2009). In each workshop, we took observational notes and wrote memos to capture as much as possible of what was going on (atmosphere, mood, group dynamics). Additionally, for project A, we had the opportunity to video-record selected workshop sequences, which can be an effective means of capturing behaviors and interactions among participants (e.g. Paroutis et al., 2015).

To triangulate our observations, we mostly used the discussions and debriefs within the organizing team and with the participants themselves (Langley and Abdallah, 2011). For the members of the organizing team, we functioned as academic sparring partners with whom they could share their thoughts and ideas. Workshop participants associated us with the 'planning function' of the foresight projects, which also led them to approach us in coffee breaks to share their reflections about specific workshop exercises and their organization's needs. While we kept in mind that our role as external facilitators influenced what image-conscious informants revealed to us, such discussions were helpful in validating our perceptions and counteracting our own potential biases. As facilitators, we were particularly sensitive to deviations from what had been planned. The discussions and dialogues with the organizing team and participants thus helped to verify our views on the progress participants made or the criticality of conflicts that arose during the workshops. We also utilized the fact that both researchers were involved in different, but comparable, projects to intensively discuss and contrast observations.

Data analysis

To analyze how participants responded to switching requests, we considered when the execution of workshop tasks had deviated from the way they had been planned. In line with the idea of studying process as a *scripted pattern* (Jarzabkowski et al., 2017), we used such deviations between scripted and enacted pattern as signposts to unravel why they had occurred.

Step 1: Establishing deviations from the script

Our data allowed us to trace whether the time that participants spent on an activity corresponded to the time that had been planned for this activity. By comparing charts of the workshop exercises as planned with the way they had actually been enacted, we were able to pinpoint when switches had (or had not) taken place. In total, we identified and observed 38 switching situations in the two workshop series. One of the first patterns we noticed across these switches was that participants had typically emphasized one activity over the other. For example, for an activity sequence bridging two or more tasks (such as exploit – explore – exploit), the middle task tended to be squeezed or skipped. In comparison to the script, bigger chunks of either exploration or exploitation had been undertaken. The further an activity went beyond the scripted time, the more pronounced we considered such deviations. For 18 switches, we identified strong deviations from the script, where either exploration or exploitation had been undertaken to the detriment of the other. For 9 switches, we identified weaker deviations where the time and effort spent on either exploitation or exploration had been lower than expected (i.e. a milder version of enacting one at the cost of the other). 11 switches had proceeded with little or no deviation from the script.

Step 2: Zooming in on switching responses

For each of the 38 switching situations, we created contextualized profiles to gain a deeper understanding of the responses that had occurred. We documented the type of switch (explore-exploit, exploit-explore) and commented on the strength of the deviation (later simplified into strong, medium, weak). We also leveraged on our observational memos and the video data to retrieve statements and comments participants had made, or whether the facilitator had to repeat instructions or intervene. Not least, we included information about the aids and materials participants had worked with. These contextualized profiles allowed us to reconstruct a more fine-grained picture of the process that had led up to the varying degrees of deviation.

Our initial coding of the data relied on a thematic analysis in which we roughly differentiated positive from negative responses to switching requests. We then further differentiated whether responses were related to behavior and concrete actions participants initiated (such as negotiating with the facilitator), emotional responses (such as expressions of anger or curiosity), or cognitive responses (such as reluctance or eagerness to take decisions).[5] Ultimately, we pooled codes together into the aggregate dimensions *behavioral displays*, *emotional displays*, and *cognitive displays*. In addition, with the dimension *strength of script*, we captured whether the participants had received strong directions (specific step-by-step instructions, pre-defined templates) or weak directions (loose guiding questions, blank flipcharts) and whether facilitators had reinforced or relaxed these directions in the workshops. Fig. 1 depicts our data structure and Appendix C provides sample data underlying each first-order construct.

To allow new insights to emerge from our observations, we had tried to suspend judgement about the nature of the cognitive, emotional, and behavioral displays we observed until our initial data structure had emerged (Gioia et al., 2013). After that, we went back to the literature to identify potential explanations for what we observed. As a result, we chose to borrow the labels of *feelings of wrongness* and *feelings or rightness* from the metacognition literature as second-order themes for the emotional displays we captured. This literature suggests that individuals will heuristically generate various choice alternatives when faced with a decision problem that are accompanied by a hunch about their appropriateness. Such *feelings of rightness* (Thompson et al., 2011) and *feelings of error* or *wrongness* (Gangemi et al., 2015) are neither emotions nor conscious judgements. More accurately, they refer to an immediate

[5] It should be noted that we rely on cognitive and emotional *displays* to describe the switching responses we observed. We cannot speak directly about the unobservable cognitions and feelings of single individuals, only infer about them based on visible responses and the atmosphere we observed in the workshops.

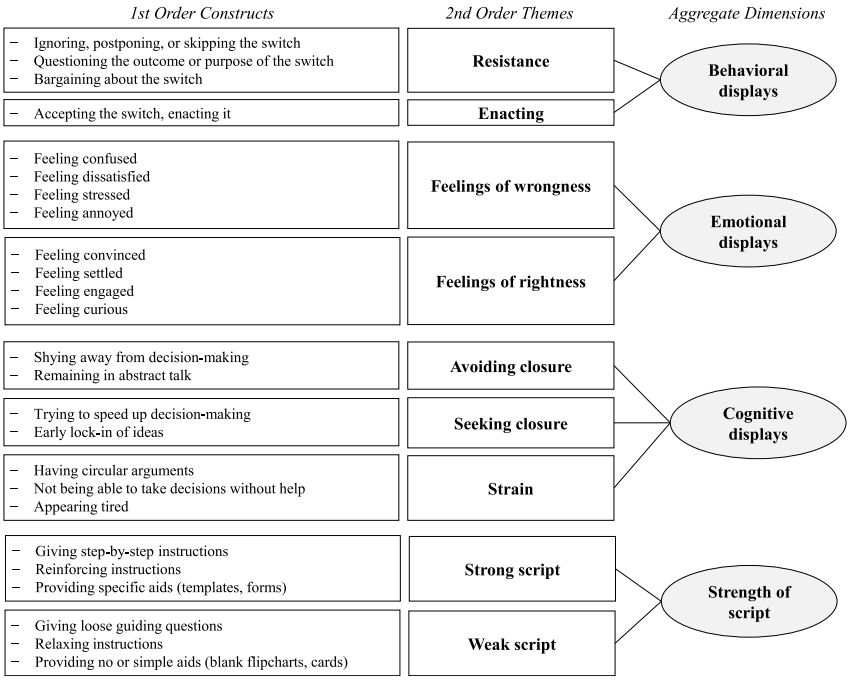

Fig. 1. Data structure.

affective response that operates at the interface of emotion and cognition. The easier and more intuitive it is to come up with a choice alternative, the stronger the feeling that this alternative is right (Thompson et al., 2011). The more cognitive effort needed to come up with an alternative, the stronger the feeling that it is wrong. Our application of these concepts differs from the way the metacognition literature uses them in that we apply them to responses triggered when a decision alternative (switch!) is imposed on individuals. We further use them to refer to a wider range of emotional displays (such as anger, stress, curiosity, conviction). Yet the concepts of feelings of rightness and feelings of wrongness seemed helpful in understanding switching between exploration and exploitation as a decision problem (stick to the current activity or start engaging in a new one) that individuals need to resolve at the level of specific tasks.

Step 3: Comparing switching responses and conceptualizing the process leading up to switching resistance

In our final analysis stages, we tried to disentangle in which order cognitive, emotional, and behavioral displays occurred and whether they tended to be directed towards the current or the next activity. We went back to the contextualized profiles for each switch, re-coded them with the language of the data structure, and chronologically ordered the emotional, cognitive, and behavioral displays. This allowed us to disentangle more clearly the temporal connectedness of the enacted pattern (Pettigrew, 1990). For example, we saw that resistance to switches often became apparent in timing-related statements. Participants demanded more time because they felt they were *"not done yet"*, or declared they were *"ready to move on"* and seemed willing to drop entire activities. Comparing these chronologies across the 38 switches allowed us to unpack a distinct pattern of resisting explore-exploit and exploit-explore switches. Comparing those switches accompanied by a strong script to those with a weak script, and those that had occurred with strong deviation to little or no deviation, further allowed us to pinpoint some organizational measures that seemed helpful in enabling switches. Appendix D provides an overview of the 38 switching situations and their variation in terms of deviation and script strength.

Findings

Our findings confirmed a tendency of individuals to resist switching by reinforcing either exploration or exploitation. Furthermore, overcoming this tendency was evidently difficult for the workshop participants. A distinct pattern of emotional, cognitive, and behavioral displays seemed to accompany responses to imposed switches between exploration and exploitation. In Fig. 2, which we further detail below, we propose a model of the process leading up to switching resistance.

Switching request. Workshop participants engaged in activities that built upon one another, meaning that finishing one activity with results of sufficient quality was necessary before the next activity could start. Participants were generally well aware of the time available for each activity. For instance, instructions would indicate they had 15 min for activity A or 30 min for activity B. Facilitators walked around to remind participants of the time left. Such explicit switching requests triggered a distinct response pattern.

Emotional displays. Generally, participants appeared to enjoy engaging in both exploratory and exploitative activities. During

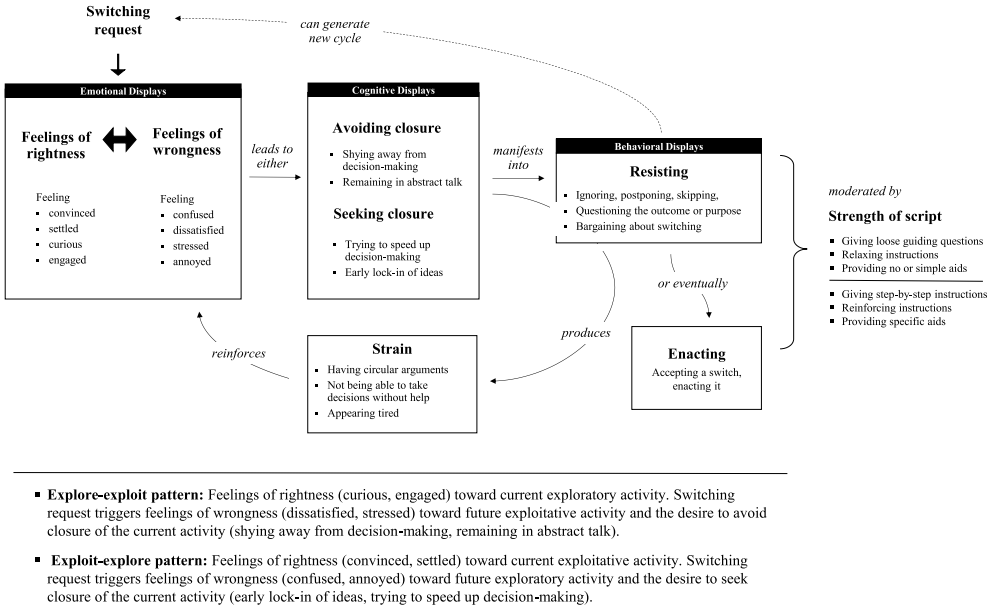

Fig. 2. Responses to imposed switches between exploration and exploitation: A generic model.

exploratory activities, we noted lively discussions involving expressions of curiosity and high engagement. During exploitative activities, such as selecting ideas and refining results, we observed some expression of positive emotions such as confidence and settlement. We coded these displays as denoting *feelings of rightness*. However, once facilitators explicitly reminded participants that it was, or soon would be, time to switch, the mood often shifted. In response to switching requests, we noted displays of emotions such as confusion or dissatisfaction, sometimes even anger and agitation. We coded these displays as *feelings of wrongness.* The pattern emerging from the data suggested that feelings of rightness were directed at further engaging in the *current* activity, whereas the prospect of having to switch to the *next* activity triggered feelings of wrongness.

Cognitive displays. Switching requests also triggered distinct cognitive displays. For explore-exploit switches, participants tended to shy away from settling on an idea and documenting their results (*avoiding closure*). In our observational memos, we noted that this reflected a kind of 'pen-and-paper allergy'. Frequently, participants remained in abstract talk about options and possibilities during the exercise, did not show signs of closing out discussions on their own, and shied away from putting results down in writing when asked to move on to the next activity. For exploit-explore switches, in turn, participants seemed keen to speed up decisions and eager to move forward with implementing and refining their results (*seeking closure*). In our observational memos, we often captured this as 'slipping into implementation mode', and participants were often hesitant to open up for a broader discussion or reflection on their results. In both cases, switching requests seemed to trigger a reinforcement of the current activity over the next activity. Unless facilitators intervened, the cognitive disengagement from the current task seemed difficult for participants. As a more general side-effect of switching, we also noted displays of cognitive exhaustion. Participants often seemed worried about their results, got caught up in circular discussions, and needed help with taking decisions. We grouped such displays under the label of *strain*, this being commonly understood as something that causes anxiety, worry, or difficulty, and a force or influence that stretches, pulls, or puts pressure on something or someone (Cambridge Dictionary, 2019).

Behavioral displays. Ultimately, participants engaged in behavior that either served to *resist* or *enact* switching requests. Resistance surfaced in many forms: bargaining with the facilitator for more time to complete an activity, challenging facilitators as to whether switching was necessary, or even ignoring requests to bring an activity to an end. Whereas we often noted such behavior in situations that had resulted in deviations from the time planned for an activity, resistance also surfaced for those switches that were enacted with little deviation from the workshop script. This indicated that something about these latter switching situations had allowed participants to overcome resistance – at least to an extent that allowed them to comply with switching requests within the time planned.

Strength of script. Our analysis indicated that the *strength of the script* is an important moderator of switching resistance. This was a construct we used to refer to the degree of autonomy participants had been given on the point of switching. What we call *strength* herein is a composite of the instructions participants received (e.g. loose guiding questions vs. specific step-by-step instructions), the aids and materials they worked with (e.g. pre-defined templates vs. blank flipcharts), and whether facilitators had adjusted the script (e.g. granted more time) or intervened (e.g. reinforced instructions). Our analysis suggested that strengthening the script, i.e. further decreasing participants' autonomy on the exact point of switching, did not necessarily increase resistance. On the contrary, certain ways of exercising control appeared to ease a switch to the next activity. We further detail the nuances of this pattern at the end of this section.

Summarizing the main insights depicted in the model in Fig. 2, requests to switch between exploration and exploitation seem to

trigger an internal battle in individuals: Because engagement in the current activity feels right, a request to switch to a new and contrasting activity feels wrong. Therefore, top-down requests to switch are met with resistance. Explore-exploit switches tend to trigger the desire to avoid closure of the current activity, while exploit-explore switches trigger the desire to seek closure of the current activity. A strong script, with clear behavioral instructions, may potentially reduce switching resistance.

Responses to imposed explore-exploit and exploit-explore switches

In the following, we illustrate and add further nuance to the response pattern introduced above. First, we exemplify how resistance surfaced for explore-exploit switches and exploit-explore switches. Next, we illustrate the impact of script strength. To make our observations from the workshops accessible to a reader, we make use of *vignettes*; narratives constructed from situations representative of other observations (Emerson et al., 2011; Jarzabkowski et al., 2014). After each vignette, we provide a short analytical summary that links the data to our analytical themes.

Explore-exploit switches. The following vignette exemplifies the typical response pattern observed for explore-exploit switches. The vignette stems from the second workshop in project A, which served the goal of probing future customer needs. It takes the perspective of the author who assisted the primary facilitator, John (all names are pseudonyms).

The persona-building exercise. "Okay, I need you to stop writing now". We are already behind schedule, because participants negotiated for an extension of the original 45 minutes they were given to consider questions like 'Who is this future customer?' and 'What are his or her needs?' Some groups are still frantically scribbling on their flipcharts, while Laura has started presenting. None of the flipcharts seem to contain much more than keywords though.

John will later reveal to me that, at this point, he had started to wonder whether it was the right choice to provide participants with blank flipcharts instead of a pre-defined template for detailing customers' characteristics. On the positive side, allowing participants to discuss the topic more freely had enabled lively discussions in the small groups – discussions they were now eager to continue in plenary.

"So, how do you feel about the profiles that are up on the wall now?", John asks after the presentations. After a pause, someone murmurs: "We did not get that far". Others are nodding. "We did not get that far, and also, these personas are a lot like our current customers." Peter shouts that this is true, and that persona 2 is exactly like that one customer, which makes everybody laugh. "But seriously", he says, "I think we just need more time, and then we can create more personas." John remarks that for the next workshop it will be more important to "get more meat" on the profiles that have been created now. He adds that the point is not, in fact, to create as many personas as possible. "But how can we know that those are the right personas to bet on?", Peter asks.

A day later, we receive an email from the project manager. She also worries that the results are not yet mature enough: "So, I have been reflecting about the workshop, and I have talked to some of my colleagues. […] I am a little sceptical to whether we can already start developing product ideas. I think it would be good to have some more time to go over the profiles at the beginning of the next workshop." Over a phone call, John and I try to calm her down. We encourage her to send the profiles to the participants for further refinement. John emphasizes that it is now important to build on what the groups have already come up with.

The next workshop starts with a surprise. The participants have decided to add a fifth persona named "The customer we do not know yet". It is a completely blank profile, but they seem really happy about it.

Analytical summary: The vignette illustrates that participants exhibit curiosity and engagement during exploration. It further illustrates how they grapple with the fact that settling on the results of exploration (here: brainstorming on future customer needs and characteristics) does not seem to feel 'right'. Whereas they are very positive and engaged (*feelings of rightness*) about the persona-building activity, the prospect of consolidating results seems to evoke *feelings of wrongness.* There is a reluctance to let go of the current activity, and participants also start doubting whether their results are at all complete (*avoiding closure*). They prefer to continue exploring personas instead of exploiting those that they already came up with. This leads them and the project manager to bargain for more time, despite having been requested to switch (*resisting*). Discomfort and worry (signs of *strain*) then peak in the creation of a blank customer profile, which seems to be something of a holdover from the previous task, helping to resolve the feeling of not being done with exploring all options.

Exploit-explore switches. The following vignette exemplifies the typical response pattern observed for exploit-explore switches. It stems from the first workshop in project B, which served the goal of identifying and ranking trends that could impact future developments in the region where the participants worked. The vignette takes the perspective of the author who acted as a facilitator.

The trend exercise. "All right", I say out loud. I want to capture the participants' attention and introduce them to the next task. It is getting late, and we are running behind schedule. They barely react. During the short break after the last task, they have gravitated back into the three groups they formed about an hour ago. They look satisfied with the timeline they have produced on the large sheets of paper plastered over most of the windows. The timeline depicts possible future events and trends for the next 25 years.

Soon, I plan to ask participants to plot these trends on a matrix according to their addressability and likelihood. First, however, I want them to brainstorm some more and discuss whether there are any potential developments we have failed to mention. No one follows my invitation. One participant, Tom, seems especially uninterested in reexamining any choices. He has already mentioned a business opportunity he wants to pursue, and he is happy to explain it to anybody interested. In an earlier exercise, he took pride

in being part of the group that finished conversations first. “Don't think too much about it”, he advised another group.

The participants have now discovered that the matrix template I plan to use next is already on the wall. They jump right into considering how to plot the trends, looking eager to finish. I try again to request that they take a minute to reflect (“Did we select the right trends here? Is there something we might have overlooked? Are there any weak signals we are missing?”). In my log, I make note of a slight expression of annoyance in response to my questions. “They look exhausted”, I also note. Some participants utter a “seems fine” or “looks great”, while continuing to focus on the matrix. In the end, one of them nods towards the result, with a satisfied smile on his face: “Is this not really good, huh?” Certainly, the trends plotted onto the matrix appear to be spot on in terms of the business interests of the participants. But in retrospect, I wonder: Did they pick their own favorites?

Analytical summary: The vignette illustrates how participants typically got satisfaction from exploitative activities such as making decisions about their pre-developed ideas. While one person stands out by taking the tasks rather lightly, participants are generally very dedicated and engaged. In contrast to exploratory activities, *feelings of rightness* during exploitation, however, are less about curiosity and more about feeling settled and convinced. At the point where participants are required to shift from exploitation to exploration (here: reflecting whether any trends are missing), they feel so settled and convinced with what they have come up with that they are more interested in quickly moving on (*seeking closure*) than checking results for completeness or blind spots. They are ready to skip the explorative activity in the middle and to continue working in a choice-based logic (here: sorting their results onto a matrix grid). In fact, the prospect of having to engage in another round of exploration seems so unnecessary to them that they even become a little annoyed when the facilitator keeps on pushing (*feelings of wrongness*), and they ignore the explicit requests to switch (*resistance*). The observation that they appear exhausted further indicates that the prospect of having to perform (yet) another switch seems to be tiring to them at this point (a sign of *strain*).

Script strength and its impact on switching: The role of control versus support

Our analysis indicated that switches rarely worked ‘perfectly’. But sometimes they worked ‘imperfectly’, meaning that participants displayed resistance but were still able to perform a switch within the time that had been foreseen. Our comparison of these switching situations to others suggested that the strength of the script, how much autonomy participants had on the timing of a switch, influenced how easily they overcame resistance. Generally, a strong script coincided with fewer deviations. For example, we noted less resistance when switching was facilitated by use of pre-defined templates and clear guiding questions. In a similar vein, we noted that relaxing instructions and decreasing the strength of the script was not helpful for overcoming resistance. For example, giving in to participants' requests for more time did not seem to help them achieve closure of the current activity on their own. Frequently, facilitators still had to interfere by reinforcing requests to switch after having granted extensions. Such reinforcements appeared to be a double-edged sword: While they helped to achieve the completion of switches, they did not help to reduce negative emotions and cognitions. To achieve the latter, it seemed more helpful to strengthen the script in other ways. For instance, introducing new artifacts and work materials in connection with a switch helped to trigger curiosity about the next activity. Moreover, direct guidance seemed helpful in channeling participants' attention and making it easier for them to let go of the current task. The following two vignettes provide brief examples of this pattern. The first vignette stems from project B and describes a situation where the facilitator first guided participants through an exploit-explore switch and then tried to break the typical response pattern for an explore-exploit switch.

The business model exercise. About five minutes into the writing, I get the first request for more time. Given that this task is all about participants working alone to note down their thoughts (so-called ‘brain writing’), I am puzzled that their sheets are still blank. “We will start writing soon”, Carla explains on behalf of her team, “but we need more time to discuss ideas”. I refrain from answering this request directly. Instead, I clarify that now is not the time to discuss. It is important to first secure a proper record of each person's knowledge. I briefly show them the template we will use for the next exercise, where team members will combine their brain-writes into novel business ideas. The brain writing then proceeds largely as planned. In fact, participants get into such a focused state that the room appears completely silent, apart from the sound of pens moving across paper. I hand out the next template. Participants seem enthusiastic and eager to get going. Quite dynamically, they enter lively and engaged discussions.

After the teams have identified one business model each, I ‘warn’ them that they should start wrapping up the discussions. Carla's team is still in deep conversation. “Just a minute”, she protests. I hand her a roll of tape. “You can always get back to the details later”. Reluctantly, Carla starts fastening tape to the corners of the template. I step over to help carry it to the wall. She hurries after me, looking dissatisfied: “It's just … I am not sure we covered everything. Remember that people are not used to working like this”. The mood has obviously deteriorated. The other groups are still elaborating on their own business models, despite my request to finish. Starting the next task might become difficult. I consider a break, but decide to finish this up. I hand out the small stickers participants will use to vote for their favorites among all the new ideas. “What are these for?”, several participants ask, looking curious. “I will tell you after every group has put their template up on the wall”, I reply with a smile. The remaining groups go straight to action.

Analytical summary: The vignette illustrates several attempts by the facilitator to strengthen the script by means of exercising control and decreasing participants’ autonomy. The attempts include reinforcing instructions (reminding them about the time available and the purpose of the tasks) handing out aids and materials (templates, tape, sticky points) as well as personal interventions (stepping over, helping to put the template on the wall). Participants first seem to be in the mood for explorative discussions,

but accept the exploitative task of brain-writing after the facilitator explains its necessity. As evident from the second switch in particular, however, merely pushing harder does not help to reduce switching resistance. On the contrary, it seems to increase frustration ("You have to remember that people are not used to working like this."). Foreshadowing coming activities (such as previewing the business model template) or making participants curious about the next task (such as distributing voting stickers) seems more effective for motivating closure of the current task and creating positive feelings about the next one.

As illustrated by the following vignette, another path to ensure switching may involve openly addressing feelings of wrongness and providing guidance in the form of emotional support. The vignette stems from project A and describes a situation where the primary facilitator's assistant tries to break the typical response pattern for an explore-exploit switch.

> *Selecting trends*. "Can't we do it together? I think it would be easier for me." Martin looks a bit defeated. I hesitate. He just needs to select the trends he finds most relevant and describe them a little bit further. When he asked me for more time earlier, I gave him templates from other projects as inspiration for how a trend profile can look like. But, apparently, this did not help much. "Okay. Let's do that." Sitting with Martin, I assure him that it is okay to not feel completely done yet with assessing all the trends and, once he relaxes, we joke a little bit that time has come to make some tough choices. Step-by-step, we go through the extensive 'trend library' he has created. We apply the selection criteria and it works just fine now, I think. Martin also seems calm and more confident again. "Okay, I think I can take it from here. I will fill in the profiles now."

The vignette illustrates how a participant struggles with negative emotions and cognitions that apparently put such a strain on him that he asks for help to finish the task ("Can't we do it together?"). In situations where participants felt this insecure or frustrated about executing switches, providing them with a stronger script in the sense of step-by-step guidance seemed most helpful. Not least, it helped to directly acknowledge negative emotions and cognitions ("It is okay to not feel completely done yet"). Similarly, it seemed helpful to point to the purpose of switching in the larger context, such as explaining why starting to work on the next activity was necessary to achieve the overall workshop deliverables.

In summary, we found the strength of the script to be an important factor for enabling or hampering switches. A strong script and increases in the strength of the script seemed helpful for overcoming switching resistance. A weak script or decreasing its strength, however, seemed to increase switching resistance. This indicates that, when individuals are already prevented from following their own preferences and dispositions regarding how to execute ambidexterity, clear instructions and close support might be the most effective measures to ensure ambidextrous behavior. We now discuss this finding further in the light of current insights in the literature on task switching and individual ambidexterity.

Discussion

This study was motivated by the observation that current research basically rests upon a bottom-up logic where individuals are granted autonomy on how to divide their time between exploration and exploitation. Taking such decisions autonomously, however, is rarely possible in a work context (Gioia and Poole, 1984). We thus set out to investigate how individuals respond when they meet strong behavioral expectations of when to explore, when to exploit, and when to switch between these two activities. The findings of our study help in understanding the execution of individual ambidexterity in top-down directed settings, and inform a model of the process through which emotional, cognitive, and behavioral aspects lead to switching resistance. Insights into the behavioral drivers of switching resistance are important because they can help to identify early signs of switching resistance, which in turn can help organizations and managers to deploy measures to alleviate it.

Theoretical implications

Our study advances explanations of why switching between exploration and exploitation is difficult for individuals. Thus far, negative side effects of switching, such as stress or strain (Gibson and Birkinshaw, 2004; Raisch and Zimmermann, 2017), have received greater scholarly attention in the literature on individual ambidexterity than the behavioral drivers that give rise to such effects. For instance, while emotional and cognitive distress have been identified as general consequences of having to prioritize between conflicting activities (Lewis, 2000), literature has not yet specified how emotion, cognition, and behavior interact as individuals grapple with decisions to switch between exploration and exploitation. By unpacking how emotional, cognitive, and behavioral responses relate when individuals react to switching requests, our study clarifies that switching requests can spur negative emotions, such as feeling stressed or dissatisfied, as well as specific decision-making tendencies, such as seeking or avoiding closure. These responses can in turn foster resistive behavior, such as ignoring or postponing switching requests. In unpacking these dynamics, our study pays greater attention to switching as a *process* that unfolds at the level of specific work tasks and activities, thereby complementing previous work focused on individual and contextual predictors of switching behavior (Laureiro-Martínez et al., 2015; Tempelaar and Rosenkranz, 2019).

While our findings confirm prior indications in the literature that switching between exploration and exploitation is complicated by both emotional and cognitive aspects (e.g. Laureiro-Martínez et al., 2015), they provide additional insight into how individuals can tackle these complications during specific tasks and activities. On the one hand, human beings are naturally myopic and risk-averse (Levinthal and March 1993). They may, therefore, be biased towards continuing with a current activity that feels familiar to them (Laureiro-Martínez et al., 2015). On the other hand, humans are goal-directed and open to considering the behavioral expectations imposed on them by their social context (Bonesso et al., 2014). Complying with imposed change despite internal conflict can be frustrating (e.g., Piderit, 2000), but we also observed instances where individuals appeared to overcome negative emotions

and cognitions and managed to substitute them for more productive emotions and thought patterns. Connecting with extant literature, our findings thus allow for the suggestion that investing effort to either suppress (Koch et al., 2010; Leroy, 2009) or work through (Miron-Spektor et al., 2018; Raisch et al., 2018) negative emotions and cognitions can help individuals steer clear of switching resistance. This, in turn, points to the effort required to deal with cognitions and emotions during switching as a central explanation for why switching causes strain and is a demanding process.

In further specifying the interaction of responses to switching requests, our study also adds nuance to the notion that exploration and exploitation are self-reinforcing activities (Gupta et al., 2006; Laureiro-Martínez et al., 2015). Notably, our findings indicate that the difficulty individuals experience during switching is not necessarily related to a general bias towards either exploration or exploitation (cf. Tempelaar and Rosenkranz, 2019). In the setting we studied, individuals seemed to exhibit a general status quo bias. They were inclined to direct their attention to the activity they were currently engaged in, be it exploration or exploitation. This chimes with the work of Laureiro-Martínez et al. (2015), who identified the individual ability to self-regulate attention as an important antecedent to individual ambidexterity. But while such work has highlighted attentional control as an important cognitive driver of being able to effectively switch (Laureiro-Martínez et al., 2015), the literature on individual ambidexterity still offers little guidance on how organizations and managers can intervene to help individuals refocus their attention.

Regarding the organizational measures that can help individuals to balance exploration and exploitation, our study suggests that top-down directions and clear behavioral expectations can support ambidextrous behavior. This does not necessarily conflict with the general idea that allowing individuals to prioritize their own tasks may help them to achieve ambidexterity (Gibson and Birkinshaw, 2004). It rather indicates that, in settings where individuals are prevented from following their own preferences and dispositions on how to execute ambidexterity, decreasing autonomy even further might be an effective means for helping them to comply with expectations. Recent work has already pointed out that control may, in some cases, help individuals to execute ambidexterity (Bonesso et al., 2014; Havermans et al., 2015; Tempelaar and Rosenkranz, 2019). Yet such work has mostly associated the need for control with individual characteristics, such as a preference for exploitation, and thus recommended a "mixing-and-matching" approach which embeds individuals in a setting that exerts a degree of control matching their natural talent for ambidexterity (Bonesso et al., 2014; Tempelaar and Rosenkranz, 2019). Our findings can serve as a complement to such a mixing-and-matching approach: They suggest that, in settings where individuals cannot be provided with the degree of control that matches their natural talents, tighter control might help them carry out ambidextrous work. For instance, in workshop settings such as the one we studied, letting individuals self-select into specific tasks or roles is typically not feasible, because it makes it difficult to maintain a joint program and schedule. It is also often undesirable, because tailoring tasks to fit individual differences defeats the purpose of utilizing participants' diversity to achieve rich insights. Thus, our findings might be of particular relevance for organizations or managers where there is a need to enforce a common pace or direction of ambidextrous work among their employees, or where the means to enable those who lack a natural talent for balancing exploration and exploitation to contribute to organizational ambidexterity are being sought out.

Managerial implications

Our study suggests that the execution of ambidextrous work tasks can benefit from top-down directions and clear guidance. Based on our findings, a combination of exercising control, by carefully designing work tasks and specifying requirements, and providing emotional support, by acknowledging the challenging nature of ambidextrous work and fostering curiosity about the work to be accomplished, seems particularly helpful. Our findings imply that organizations seeking to stimulate individual ambidexterity should pay attention to the negative emotions and cognitions that are likely to surface when individuals need to switch back and forth between exploration and exploitation. Being able to identify such response patterns, however, is only the first step towards helping individuals to overcome switching resistance. The observation that aids and instructions influenced how easily individuals were able to switch suggests that organizations should invest in task design. Using simple artifacts, such as templates, may already make a substantial difference in triggering curiosity and positive emotions about a new task and help to achieve closure of a prior task. Providing emotional support by acknowledging that it is 'okay to not feel completely finished', or taking the time to explain the necessity of alternating between exploration and exploitation, may also help. Providing such a level of guidance, however, requires managers and facilitators to engage closely with the individuals who execute ambidexterity. Thus, organizations and managers need to allocate time to attend to switching resistance.

Boundary conditions, limitations, and future research

Whereas facilitated workshops have become a common format for engaging in strategizing activities and innovation-related work (e.g. Hodgkinson et al., 2006; Jarzabkowski et al., 2015), they can be seen as an extreme case of top-down directed ambidexterity. Yet, this does not mean that the responses observed are restricted to this setting (e.g. Eisenhardt and Ott, 2017). Although our study was not designed to verify this as such, the response pattern we describe seems to have a conceptual coherence that suggests it might also occur in settings where individuals have greater autonomy in dividing their time between exploration and exploitation. In such settings, individuals are unlikely to face explicit switching requests, but might still feel the obligation to adhere to a split between exploration and exploitation that could conflict with their individual preferences. Our study and the model we propose should thus be taken as a first step towards further mapping out the behavioral drivers underpinning switching resistance.

Specifically, our study points to three main avenues for future research. First, our findings invite further thinking about how structural control and contextual support can coexist and complement each other in supporting individual ambidexterity. Future research could pay greater attention to autonomy and control in the settings where individuals execute ambidexterity and, for

instance, test how these factors increase or decrease individuals' ability to behave ambidextrously. Such research could also measure how autonomy and control influence the outcome of ambidextrous work (e.g., based on evaluations of work quality, provided by superiors, peers, or customers). The literature on resistance to change (Oreg et al., 2018; Piderit, 2000), behavioral organization design (Foss and Lindenberg, 2013; Lindenberg and Foss, 2011) and work design (Frese and Fay, 2001; Parker, 2014) also appear to be interesting avenues to align with here.

Second, future research could more explicitly tap into the relevance of timing and time perception for individual ambidexterity. Our study provides the preliminary insight that merely adding more time did not make it easier for participants to overcome switching resistance. Future work could test this proposition, for example by means of a controlled experimental design. Such work could assess participants' subjective experiences of time and time pressure as an additional explanatory variable. Observing how switches take place during more ordinary work practices, as opposed to workshops, might also contrast with our findings in interesting ways. Individuals may have greater formal autonomy on how to divide their time in such contexts, but they are also likely to face other challenges such as synchronizing and coordinating their switching decisions with whichever social setting they happen to be in.

Third, our findings provide a starting point for charting the interplay of emotions and cognitions when resolving ambidexterity at the individual level. Additional research on how switching resistance emerges seems critical for informing the important question of how individuals can learn to overcome it. Over the course of the workshops, we did not find any indication that participants 'got used to' or 'better at' switching. On the contrary, repeated switches seemed to exhaust them and increase strain. In spite of this, at least some of the individual characteristics identified as helpful for coping with the cognitive demands of ambidexterity, such as the ability to self-regulate attention, are learnable skills (Laureiro-Martínez et al., 2015). It would be very relevant to investigate further how metacognitive awareness might help regulate switching resistance and feelings of wrongness. Such research could connect with recent work, which has shown that a paradox mindset is helpful for coping with explore-exploit tensions (Miron-Spektor et al., 2011, 2018; Raisch et al., 2018). In general, we hope that our study can spark more work on switching and the role of cognition and emotion during the execution of individual ambidexterity.

Conclusion

This study has unpacked the behavioral drivers that underpin individuals' resistance to comply with imposed shifts between exploration and exploitation. Specifically, it has proposed how emotional, cognitive, and behavioral responses interrelate in the process that leads up to switching resistance. As organizations increasingly require their members to contribute to organizational ambidexterity, it becomes important to better understand not only the benefits but also the negative side-effects of imposing ambidexterity on individuals. The findings of this study show that a key to supporting individuals' ambidextrous behavior might be found in the specific format through which expectations to switch back and forth between exploration and exploitation are put forward.

Acknowledgments

We thank guest editor Sebastian Raisch and excellent anonymous reviewers for their exemplary engagement with our work, which has greatly enhanced the clarity and accessibility of our contribution. We further thank René Rohrbeck for his invaluable support in conducting this study and Hans Berends, Tor Boe-Lillegraven, Emma Perriton, Claus Thrane, Lars Frederiksen, and Jakob Lauring for commenting on earlier versions of this paper. We also acknowledge the comments received by Ann Langley and the participants of the KIN Research Summer School 2018 and by the reviewers and audience members at the 2018 Academy of Management Annual Meeting in Chicago. Lastly, we would like to thank Michiel Tempelaar for a useful and well-timed discussion.

APPENDIX A. Project and workshop details

	PROJECT A	PROJECT B
Theme	Future of the professional services industry	Future of the maritime industry
Initiator	One organization	Multiple organizations
Sector	Private	Public and Private
Industry	Professional Services	Maritime Industry
Characterization	SME	Industry Association
Project goal	Identify opportunities for new product development	Identify future business opportunities relevant for the region
Timeframe	4 months	4 months
Participants	12 members of the organization	9-13 participants from different organizations.
Function of participants	CEO and employees, thereof one responsible for the project	Technical experts and managers, thereof one hosting
Workshops	1 preparation and 3 core workshops á 5 h	1 preparation and 3 core workshops á 5 h

Workshop 1	Our Industry in 2025	Our Region in 2025
Sample group tasks	- Consider how the world would look like in this scenario and create a description. - What are challenges for us in such a scenario? What are strengths? Consolidate your results on two separate flipcharts.	- Explore which trends may impact the region in the future. - Sort and rate trends according to specific relevance criteria.
Number of participants	13 (full attendance + 1 intern)	13 (representing 10 organizations)
Workshop 2	**Future Customer Needs**	**Future Business Models**
Sample group tasks	- Create a vivid persona profile: Who is this customer? What are his or her needs? - Challenge the profiles of the other groups, and add to them where necessary.	- Select a trend and develop a business model around it. - Assess and vote on complete business model templates.
Number of participants	11 (1 employee on sick leave)	9 (representing 8 organizations)
Workshop 3	**Product Building**	**Consortia/Project Building**
Sample group tasks	- Discuss ideas for offers to address future customer needs. Elaborate on your Top 3 ideas with the help of the template. - Vote for your favorite product idea and discuss what its implementation would require.	- Explore each-others interests and potential complementarities with the aim to build project consortia. - Discuss and note down: What are the logical next steps for moving the project forward?
Number of participants	9 (3 employees on sick leave/holiday)	13 (representing 9 organizations)

APPENDIX B. Data collected

Project A

Data	Authorship	Format and Length/Number
Observations*	Researcher	- 28 h of attending workshops (incl. preparation at facilities and debriefs), thereof 53min. captured as video material, transcribed on 12 pages and recorded in 27 photographs - 21 h of attending project meetings and phone conferences, 5 meeting minutes, numerous emails and phone calls - 92 pages of notes and reflections on the workshops and projects
Input Documents Workshops**	Core Team	Agendas and invitations, 55 slides, 4 posters, project pinboard, numerous templates for exercises.
Output Documents Workshops**	Participants	- Trend 'library' (8-page summary, 30 reports and studies) - 10 trend profiles - 4 scenario descriptions (post-it walls, posters) - 6 persona descriptions (post-it walls, flipcharts, photos) - 11 product/service idea descriptions - 20 pages + 11 ppt slides workshop documentation - Answer sheets warm-up exercises, feedback forms
Project Documents	Core Team	5-page initial project description, 3-page final report + 30 ppt slides

Project B

Data	Authorship	Format and Length/Number
Observations*	Researcher	- 27 h of attending workshops (incl. preparation at facilities and debrief) and 36 photographs - 17 h of attending project meetings and phone conferences, 6 meeting minutes, numerous emails and phone calls - 6 slides with emerging issues and concerns - 104 pages of notes and reflections
Input Documents Workshops**	Organizer team	Agendas and invitations, 96 slides, 4 posters, questions for online voting, various templates
Output Documents Workshops**	Participants	- Trend 'library' (list of opportunities and ideas, list of 50 trends) - Voting results from questionnaire and voting during workshop #1 - 50 slides with trend profiles - 1 timeline with trend overview (posters, post-its) - 6 in-depth descriptions of selected trends - 7 descriptions of business model ideas - Report with 7 project/business model profiles and consortia ideas
Project Documents	Organizer Team	2 page summary of workshop process, 71 summary slides (including final report), 10 page summary of project ideas

* Documents used to further analyze and categorize the data (such as spreadsheets, tables, slides) are not included in the count.
** Only final versions included in the count.

APPENDIX C. Representative excerpts from field notes, reflections, and documents for first-order constructs: Sample switches

Sample Switch	Explore one idea – Detail implementation effort (Explore-exploit; PA/WS3/S14)	Imagine business models – Form consortia (Explore-exploit; PB/WS3/S17)	Refine selected idea – Search for missing info (Exploit-explore; PA/WS3/S17)	Elaborate on trends – Challenge assumptions (Exploit-explore; PB/WS1/S6)
Resistance				
Ignoring, postponing, or skipping the switch	Ps put the template aside instead of filling it in, it seems they prefer to discuss more freely.	Ps ignore the invitation to relocate to the other end of the room where we put the posters and start consortia building.	Ps walk around and look at the other groups' ideas but they do not add comments or questions.	Several Ps focus on cutting up pre-listed trends into sortable 'trend cards' rather than writing down new trends.
Questioning the outcome or purpose of the switch	Maria says she thought the point of all this is to detail the implementation effort and not to take premature decisions.	"It is kind of hard to make any further decisions when all the people involved are not here."	//	//
Bargaining about the switch	Ps ask to move the exercise to the plenary because it is "*hard to do it alone*"	Tom and Paul hesitate to assign a leader that will formulate follow-up steps. Eventually they suggest a person who is no longer present.	The PM says she thinks we can move on to the next exercise faster than planned.	Ps don't find it necessary to challenge results ("I think that what we already voted on covers a lot of ground.")
Enacting				
Accepting the switch, enacting	Ps readily move to their group tables, they seem eager to further work with the idea they selected.	Ps easily get into the discussion to further explore specific business models. None seem tempted to skip into implementation mode.	Ps are a bit hard to drag away from their product ideas, but they now follow the invitation to walk around and look at other groups' ideas.	All Ps participate in the voting as part of the elaboration part (only one with some delay, due to technical problems with his phone).
Feelings of wrongness				
Feeling confused	Ps are reluctant to cluster ideas ("But how? I don't think we can say yet.").	"Can you come over here for a bit, we don't really get what to do here."	//	Eric says he is not sure what to add and ask if they should not rather start sorting the trends.
Feeling dissatisfied	Several groups complain it is too early to start comparing ideas along their implementation effort. They seem unhappy with the reply that this is only a preliminary sorting.	"Whoooh, you drive us hard".	Peter shrugs "Honestly, I don't think I can add much here."	//
Feeling stressed	Ps ask whether we can have the coffee break earlier, but I suspect they just want some more time to keep discussing.	Ps appeared stressed that they have to move on from the current topic ("But just to finish what we were talking about…")		//
Feeling annoyed	Maria shakes her head and puts a big red disclaimer "to be detailed" in the upper corner of her template.	"Just a minute" (seems slightly annoyed at F)	"Challenge what? We just refined the ideas."	//
Feelings of rightness				
Feeling convinced	//	//	Ps seem very happy, almost proud, with the ideas they created.	The discussion is not really about additional trends, Ps mostly re-confirm to each other that the ones they identified are really relevant.
Feeling settled	//	//	Ps only make small adjustments when F asks them to challenge the positioning of the product ideas.	Ps say that the trends they voted for are sufficient to move on.
Feeling engaged	It is very loud in the room, all the groups are discussing agitatedly.	Several Ps get involved in conversation about funding schemes. ("So, what are the other funding possibilities? Can we hear more about that?")	Mark and his team ask for more paper because they want to draw the customer journey and add details of the sales process.	Ps provide the feedback that "voting was fun". They were all very attentive during the voting.
Feeling curious	Ps quickly snatch the templates, they seem eager to inspect which guidelines they got to further explore the selected idea.	Ps express interest and are paying close attention when the "full" business models are presented.	//	The room is completely silent before the first voting result is introduced, all eyes are on the big screen. 3 Ps ask questions to learn more about the tool after the voting.
Avoiding closure				
Shying away from decision-making	Peter brings up that it might be worthwhile to bring the ideas they did not select in the prior exercise back into the discussion.	Ps seem to discuss trends and the future of business more generally instead of naming potential partners, assign responsibilities, and formulate next steps.	//	//

Remaining in abstract talk	F asks again whether the group can specify the next steps that should be taken, but Ps are rather evasive ("*one would need to consider the implementation effort further*").	Some Ps have gone completely off topic (discussing weekend plans) while others seem stuck in a very general conversation about funding.	//	//
Seeking closure				
Trying to speed up decision-making	//	//	"Let's just combine these two, there you go!"	Tom's team hurries to cut up all the pre-listed trends into sortable 'trend cards', then announce that they are done and ready to move on.
Early lock-in	//	//	Ps already seem quite attached to their idea, I overhear Susan saying she thinks it is "gold" and much more realistic than the others.	Ps do not use up the time set aside to challenge assumptions; many seem to be happy with what they have come up with.
Strain				
Having circular arguments	//	I remind Carla's team that they have the task to identify at least one ICT partner for a mineral drilling project, but after 10 min, they still seem to be discussing possible drilling technologies.	Susan and her team got stuck in a debate on some legal issue ("Fine, I say let's ask Peter right now, I am 90% sure that it is possible.")	//
Not being able to take decisions without help	Ps seem very reluctant to specify implementation effort, F has to ask a lot of follow-up questions ("Would you say it is higher than for the other idea?" etc.).	Two of the teams eventually engage in consortia building, but struggle to define next steps without F's help.	//	Based on a list of general ICT trends provided by the facilitator, Ps ultimately add three additional trends.
Appearing tired	//	Several Ps just gaze into the room, they have that 'blank stare'.	"We did discuss, I think it is safe to move on."	//
Strong script				
Giving step-by-step instructions	F goes to each group to clarify how to fill in the template and how to qualify implementation effort along two dimensions (market, product).	F instructs Ps to "get up now" and choose their favorite idea by physically placing themselves in front of the respective poster.	//	Ps receive very specific instructions on how to detail trends (verbally and via the slides).
Reinforcing instructions	F pushes harder that the groups need to come to an end now and wrap up their discussions.	F points to the sides of the room and asks "Who is for project X?", "Who is for project Y?" "Then, please move over to that space".	F reminds Ps that they should start walking around and consider the others' ideas.	When the discussion of trends seems to go off track, F intervenes and asks more specific questions.
Providing specific aids	Ps are given a rubric to qualify the implementation effort in terms of product and market development.	F uses templates that are already half-completed to focus the attention on remaining steps and ease the work load.	//	The voting is steered by means of a presentation, a webpage, and the mobile phones of participants.
Weak script				
Giving loose guiding questions	Template says "name key implementation steps".	F asks every team to "complete the templates" as part of the consortia building task.	"Challenge the other groups' ideas. Is there something missing? Is there something you can add?"	The instructions given for the trend discussion part are initially quite general, they do not specify how many trends should be identified.
Relaxing instructions	F grants a 5 min extension to wrap-up and complete the templates that are still largely empty.	F does not interrupt even though Ps seem to take a detour in their discussions.	F does not insist that the groups spend the planned time on searching for missing info ("Fine, when you are happy with the descriptions, I am happy.")	F avoids conflict and backs off.
Providing no or simple aids	//	F hands out sticky notes but does not specify what to do with them.	Ps are provided with post-it notes to put comments or questions to add to the other groups' ideas.	The discussion part of the task uses a list of the trends from the voting in addition to blank paper.

PA = Project A, PB = Project B, WS = Workshop, S = Switch, Ps = Participants, PM = Project Manager, F = Facilitator; otherwise pseudonyms used throughout.

APPENDIX D. Overview 38 switching situations

Project/WS*/Switch			Task	Type	Script	Deviation
A	WS 1	7	Elaborate on implications – Search for missing info	Exploit-explore	M	M
B	WS1	6	Elaborate on trends – Challenge assumptions	Exploit-explore	M	M
A	WS1	5	Help refine other scenarios – Challenge assumptions	Exploit-explore	M	S
B	WS2	14	Map current knowledge – Create business models	Exploit-explore	S	M
A	WS1	4	Refine scenario – Search for missing info	Exploit-explore	W	M
A	WS3	17	Refine selected idea – Search for missing info	Exploit-explore	W	M
A	WS2	10	Describe the persona – Search for missing info	Exploit-explore	W	S
A	Pre-WS3	11	Detail persona profile – Brainstorm product ideas	Exploit-explore	W	S
A	WS3	12	Refine strategy statement – Search for new options	Exploit-explore	W	S
A	WS3	13	Consider persona profiles – Brainstorm product ideas	Exploit-explore	W	S
B	WS1	10	Select trends – Explore trend impact	Exploit-explore	W	S
B	Pre-WS1	1	Describe current situation– Explore future trends	Exploit-explore	W	S
B	WS1	8	Sort trends – Experiment with alternative sorting	Exploit-explore	W	S
B	WS1	12	Rate trends – Search for missing information	Exploit-explore	W	S
B	WSs	19	Refine trend library – Explore additional ideas	Exploit-explore	W	S
B	Pre-WS1	4	Research trends – Put results into a trend profile	Explore-exploit	M	M
B	WS2	15	Create business models – Consolidate by voting	Explore-exploit	M	M
B	WS3	17	Imagine business models – Form consortia	Explore-exploit	M	M
B	WS3	18	Explore consortia – Present short summary	Explore-exploit	M	M
B	Pre-WS1	2	Brainstorm about trends – Note down trends	Explore-exploit	M	S
A	WS2	9	Brainstorm about cluster – Derive a persona	Explore-exploit	M	W
A	WS3	14	Explore one idea – Detail implementation effort	Explore-exploit	M	W
A	Pre-WS1	2	Explore scenario impact – Consolidate description	Explore-exploit	S	W
A	WS3	15	Discuss different product ideas – Categorize ideas	Explore-exploit	S	W
A	WS3	16	Discuss categorized product ideas – Select best idea	Explore-exploit	S	W
B	WS2	13	Imagine business models – Map current knowledge	Explore-exploit	S	W
B	Pre-WS1	3	Explore likelihood of trends – Select likely trends	Explore-exploit	S	W
B	WS1	5	Imagine scenarios – Choose the most likely scenario	Explore-exploit	S	W
B	WS1	7	Discuss trends – Sort trends	Explore-exploit	S	W
B	WS1	9	Explore sorting implications – Select trends	Explore-exploit	S	W
B	WS1	11	Explore trend impact – Rate trends	Explore-exploit	S	W
A	Pre-WS1	1	Search trends – Select trends	Explore-exploit	W	S
A	WS1	3	Explore options – Write strategy statement	Explore-exploit	W	S
A	WS1	6	Explore implications – Select relevant implications	Explore-exploit	W	S
A	WS2	8	Explore customer needs – Cluster customer needs	Explore-exploit	W	S
A	WS3	18	Experiment with implementation options – Consolidate into roadmap	Explore-exploit	W	S
A	Post-WS3	19	Discuss need for changes – Consolidate roadmap	Explore-exploit	W	S
B	Pre-WS3	16	Search for information – Complement templates	Explore-exploit	W	S

**WS=Workshop*

***Explanation**: The table shows an overview of our coding of the 38 switching situations, sorted along type of switch (explore-exploit, exploit-explore), deviations (S = strong, W = weak, M = medium) and the strength of the script governing those switches (S = strong, W = weak, M = medium). For simplicity, tasks are abbreviated.*

***Example:** The task around switch 7 in workshop B required participants to discuss trends and then sort them according to relevance and time perspective. Because the first part was largely about discovery and search, and the last about refinement and choice, we coded this as an explore-exploit switch. Participants received step-by-step instructions about how to conduct the task. Trend cards were used to guide them in discussing the trends and a visual timeline drawn on the wall was used to further guide the sorting. The facilitator reinforced task instructions and directed participants to the wall when they did not approach it themselves. The facilitator did not give in to requests for more time. For these reasons, we coded the script as strong. While participants showed some signs of resistance (had to be reminded to start sorting trends, expressed need for more time), the task was completed within the scheduled time and without exploration or exploitation having distinctly 'outweighed' the other. Thus, we coded this task as a switch completed with little or no deviation compared to the planned script.*

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