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Executive summary

Verander je organisatiestructuur en je verandert en verbetert het probleemoplossend vermogen van je team. In een “Innovatieve Arbeidsorganisatie” is de rol van de teamleider belangrijk: ondersteunend, maar niet te sturend. Zo gaan teamleden zelf op zoek naar mogelijke oplossingen voor complexe problemen.

Dit rapport omvat de impactevaluatie van de projecten gerealiseerd in de ESF “Anders Organiseren” oproep. Dit ‘Anders Organiseren’ verwijst naar een Innovatieve Arbeidsorganisatie, waar de organisatiestructuur en de werkbaarheid van de medewerkers centraal staan. De achterliggende principes worden gevormd door de moderne sociotechniek. In deze studie lag de focus op de impact van de organisatiestructuur op het probleemoplossend vermogen van teams. De centrale onderzoeksvraag was dan ook waarom, wanneer en hoe een team erin slaagt succesvol complexe problemen op te lossen, binnen de context van een Innovatieve Arbeidsorganisatie. Om complexe probleemoplossing te bestuderen, werd beroep gedaan op “adaptive sensemaking” als overkoepelende theorie, en meer specifiek op vier mechanismen die teamleden in volgorde doorlopen om tot een succesvolle manier van probleemoplossing te komen: patroonherkenning, cognitieve dissonantie, ‘perspective taking’ (standpunten innemen) en motivatie. Daarnaast worden de belangrijkste voorwaarden bestudeerd waaraan de organisatie-/teamcontext moet voldoen om die mechanismen te activeren, om zo tot een oplossing te komen.Organisaties werden geselecteerd op basis van één van de structurele criteria uit de moderne sociotechniek:

- Cross-functionaliteit: teamleden werken samen aan een gemeenschappelijk doel, de taak van het team bestaat uit verschillende operationele activiteiten;
- Despecialisatie: het team staat in voor zowel directe (uitvoerende) taken als indirecte (ondersteunende) taken zoals planning opmaken, onderhoud en kwaliteitscontrole;
- Functionele integratie: een aanzienlijk deel van het team kan zowel alle directe als indirecte taken opnemen, er is geen gevaar dat iemand maar één taak kan opnemen.

Andere theoretische randvoorwaarden die we hanteerden bij de selectie, zijn de aanwezigheid van “Organizational Mindfulness” (de mate waarin een organisatie opkomende problemen herkent en een vermogen creëert om snel te reageren hierop) en “Mindful organizing” (de manier waarop organizational mindfulness vertaald wordt naar meer operationele termen, bijvoorbeeld binnen teams). Een voorbeeld hiervan is dat het team bespreekt wat belangrijk is wanneer een taak wordt doorgegeven aan een ander teamlid. Op deze manier konden we 6 teams in 2 organisaties selecteren, waaruit we in totaal 8 relevante cases van probleemoplossing konden identificeren. Om de vier vooropgestelde theoretische mechanismen te bestuderen, werd gebruik gemaakt van de onderzoeksmethodiek “process tracing”. Dit is een methodiek ontworpen om causale mechanismen op te sporen in reële probleemsituaties met behulp van een gedetailleerde case studie. In twee cases werden de causale mechanismen volledig geanalyseerd.. In de zes overige cases focust de analyse op een aantal sleutelonderdelen uit de mechanismen.

Slechts twee van de acht cases zijn operationele probleemsituaties, het merendeel van de cases gaat over een tactische probleemsituatie die verder gaat en om een strategische (beleids-)oplossing vraagt. Slechts één van de acht cases heeft een afwijkend (*deviant*) resultaat, wat wil zeggen dat er geen werkbare oplossing gevonden werd. De probleemsituaties gaan over uiteenlopende onderwerpen:

zelf een planning maken als team, afspraken omtrent stagiairs, een “rampenplan” uitrollen wanneer er veel afwezige teamleden zijn etc.

Uit de analyse blijkt dat het detecteren van een probleem duidelijk gebeurt, echter te weinig pro-actief en dus vaak wanneer er al fouten gebeurd zijn. Het vinden van een oplossing is moeilijker te observeren en vaak zijn niet alle teamleden betrokken bij dat proces. Dat zorgt ervoor dat een gedeeld perspectief niet altijd bereikt wordt, waardoor teamleden minder geneigd zijn zich te engageren voor de oplossing. De rol van de teamleider is belangrijk in dit proces: in bepaalde cases neemt de teamleider het initiatief om bijvoorbeeld een oplossing voor te stellen. We zien dat dit soort oplossingen kunnen resulteren in een positieve uitkomst waarbij de teamleden tevreden zijn en gemotiveerd zijn om bij te dragen aan de oplossing (bijv. case 2). Langs de andere kant, is het in sommige cases moeilijker te observeren of teamleden daadwerkelijk achter de oplossing kunnen staan (bijv. case 8). Vermoedelijk is de reden dat één van de cases (case 5) een afwijkende uitkomst heeft, waarbij geen passende oplossing gevonden werd, wegens het gebrek aan een gedeeld perspectief.

Vanuit deze resultaten kunnen enkele aanbevelingen voor de praktijk worden geformuleerd:

- Belang van *functionele integratie* in een team: dit betekent dat teamleden meer kennen/kunnen dan hun eigen job en in staat zijn zich flexibel in te zetten in het team. Bij afwezigheden kunnen verschillende teamleden worden ingezet, waardoor de planning vlotter kan verlopen. In de cases observeerden we frustraties bij teamleden omtrent hun uitgebreide verantwoordelijkheden, gecombineerd met een gebrek aan tijd om deze verantwoordelijkheden bovenop hun andere taken op te nemen. Als teamleider probeer je frustraties in te dijken door gesprekken op te starten tussen teamleden, met als doel een gedeeld perspectief te bereiken. Deze onuitgesproken frustraties kunnen namelijk escaleren tot een groter probleem dat moelijker op te lossen valt.
- Nieuwe werkafspraken gradueel implementeren, in samenspraak met het team. Veranderingen zijn moeilijk, zeker als ze impliceren dat teamleden andere en/of meer taken moeten uitvoeren. Geef het team de tijd om te wennen aan de nieuwe manier van werken, dat vergroot de kans dat ze zich zullen inzetten voor een oplossing.
- Het “waarom” benadrukken van werkafspraken: waarom worden bepaalde afspraken gemaakt? Wat is het voordeel voor het individu, het gehele team en de klant? Teamleden zullen sneller geneigd zijn zich te schikken naar werkafspraken, als ze zien waarom de afspraken er zijn en waarom ze een voordeel kunnen inhouden voor zichzelf, het team of de klant.
- Communicatiedoorstroom optimaliseren: tijdsgebrek en gebrek aan capaciteit zorgen ervoor dat informatie verloren gaat of fout wordt doorgegeven. Dit zorgt voor misverstanden en werkproblemen (bijv. onduidelijke afspraken over verantwoordelijkheden). Om dergelijke problemen te vermijden, kan de teamleider een rol opnemen om de verschillende communicatiekanalen duidelijk te structureren, waar mogelijk te simplificeren. Hierdoor krijgen teamleden meer grip op de veelheid aan informatie. Dit kan door bijvoorbeeld door een teamlid als contactpersoon aan te stellen per thema (bijv. personeel, marketing, IT etc.) en zo dat teamlid een focus te geven om selectief informatie op te slaan en door te laten stromen naar de andere teamleden.

1. Introduction

This research was commissioned to evaluate projects in the ESF-call "Organizing differently"[1]. More specifically, we examined "why, when and how a team succeeds in complex problem-solving". As the aim of the ESF-call is to subsidize socio-technical structural interventions, we studied complex team-problem-solving within the context of modern socio-technical organizations.

This report presents the final output of our research. We start by discussing the purpose and scope of the evaluation (chapter 2). Subsequently, the research methodology is defined in chapter 3. The fourth chapter details the theoretical framework and research questions. First, the theoretical concept of Modern Socio-Technical Organizations, which is used as a context in this study, and secondly, the theories of the four causal mechanisms are summarized. In the fifth chapter, we discuss the selection process of the organizations we contacted in order to have access to teams and cases. Chapter 6 entails the empirical results. First, we give an overview of the analyzed cases with the according selection criteria. Secondly, the analyses of the cases are presented. This chapter finishes with cross-case conclusions and a discussion on Socio-technical Design Theory as the main theory in this research. The last chapter (7) entails recommendations for practice and for future research, based on the results of our empirical data and on an expert workshop[2] which took place on July 3rd in Brussels.

[1] For the call document, see annex 11.

[2] For a full report of the workshop, see annex 7.

2. Purpose and scope of the evaluation

The current evaluation research started in January 2018 and was finished in January 2021. It concerns the "Anders organiseren" or "AO" ("organizing differently") projects for the working population in Flanders, funded within the framework of the Flemish European Social Fund Operational Programme for the period 2014-2020 (under its priority 4: "partnership development and people-oriented entrepreneurship" and its investment priority 8.5: adaptation of employees, enterprises and entrepreneurs to change). The rationale for this intervention is that Flanders needs to increase its employment rate (71,5% but targeting 76% by 2020). The workability of jobs in Flanders is one of the elements that influences this employment rate in a preventative way (reducing the early leaving of the labor market). Workability is defined as the balance between human resources and the demands of work (see also Job Demands-Resources model; Karasek, 1979; Bakker & Demerouti, 2007; Schaufeli & Taris, 2014). The aim of the "Anders organiseren" project call is to improve workability of jobs by stimulating organizations to adapt their organizational structure. Organizations that submitted to this call, had to perform an analysis of their organizational processes, redesign and implement a new organizational macrostructure, and develop a system to support their first-line executives in this transformation.

As stated in the evaluation call document, the "Anders organiseren" projects represent a significant proportion of the ESF funds in the Flemish ESF program and are likely to be repeated in the future. From a program management and policy standpoint, an impact evaluation is required in order to learn what determines the potential success and the attainment of beneficial effects of the subsidized interventions. From a more theoretical and scientific standpoint, an impact evaluation contributes to the empirical testing and validation of theory-based hypotheses with regard to the expected outcome of specific interventions. The combination of both policy and scientific learnings makes this research highly relevant.

The evaluation objectives of this study are threefold:

- to learn through systematic enquiry how interventions perform in order to better design, implement and deliver future ones.
- to increase the understanding via what key mechanisms and under what conditions projects generate more improvements in terms of quality of labor, for similar levels of productivity.
- to enable the evaluator to pinpoint which requirements for funding of such projects should be considered to be modified, dropped or reinforced as well as provide suggestions as to how this could be done.

The case (unit of analysis, see also methodology) is a single instance of problem solving in a team. This is a front-line team, operating within a newly implemented structure. **The temporal scope** of this study refers to the actual changed organization structure, which means that only projects with administrative status "in execution" or "finished" can be included in the research. More specifically, projects that had not started by December 2018, would not present the progress necessary for this research to be able to trace the causal mechanisms of interest, and are therefore not included in this study.

The total population consists of 73 organizations (projects) which were enrolled in a running or finished ESF-subsidy project. 31 organizations (42%) had less than 50 FTE, and 34 organizations (47%)

had between 50 and 250 FTE. 29 organizations (40%) can be categorized as non-profit, the other 44 organizations as profit (60%). Human health and social work are the sectors with the highest representation (37%). Most projects/organizations were based in East- and West-Flanders (respectively 37% and 27%).

3. Research methodology

3.1. Process tracing

As proposed in the call, these evaluation questions will be addressed using "process tracing", a research method designed to "trace causal mechanisms as they operate in real-world cases" (Beach & Pedersen, 2019; see also George & Bennett, 2005; Bennett & Checkel, 2015; Beach and Pedersen, 2016; Beach & Rohlfing, 2018), using detailed within-case empirical analysis. We understand causal mechanisms as causal processes that are triggered by conditions (or a combination of conditions) and that link them with outcomes in a productive relationship (Beach & Pedersen, 2019). The essence of this method is its focus on mechanistic explanation, where the analytical focus goes from conditions and outcomes to the hypothesized causal process in between them. More elaborate information on the process tracing methodology applied in this study can be found in Annex 1.

In this research, we perform a systematic comparison and within-case analysis using the concepts developed by Ragin (1987) and his distinction between "observational unit", the unit used in data collection and data analysis; and the "explanatory unit", the unit used to account for the patterns of results obtained (Ragin, 1987). In particular the "casing" operation, i.e. the conceptual and empirical delineation of the cases, is a crucial one because it is a prerequisite for rigorous and robust conclusions (Rihoux & Lobe, 2009). Thus, for this evaluation, the explanatory unit for which we expect to make our generalization will be the selected teams within a project implemented in a given organization in Flanders. The observational units are employees working within those teams within organizations (nested model). Selected employees were interviewed, individually or in small groups.

When performing within-case analysis with Process-Tracing, the cases will be instances of a causal process playing out, linking causes with the outcome (Beach, 2016), and will be the unit in which a given causal relationship plays out, from the cause to the theorized outcome.

3.2. Extending the theoretical scope

In the early stage of this research, Modern Sociotechnical Design Theory (STDT) was considered as the main causal theory of this evaluation, however, during the research process we realized about the probabilistic nature of this theory which is not well suited to conduct Process-Tracing – given the deterministic nature of Process-Tracing methods. The argument here is that solely using Modern Sociotechnical Design Theory to construct a causal framework seems to be not sufficiently adequate when using Process-Tracing for the following reasons:

- STDT lacks deterministic causal claim.
- Absence of causally productive relationship between STDT concepts.

Process-tracing makes a deterministic causal claim, which means that specific causes lead to a given outcome through a causal mechanism (why and how a phenomenon worked). Organizational structural characteristics used in STDT express predictions of expected behaviour or action. These characteristics serve as norms that define the limits or the constraints in which individuals or groups

of workers can (inter)act. Given that STDT is a prescriptive theory, it predicts but does not explain actual instances of behaviour or action. STDT doesn't explain why and how exactly people engage in complex problem solving when more autonomy (control options) are available.

The nature of 'phenomena' used in Modern Sociotechnical Design Theory is related to organizations' structural characteristics. An organizational work structure as a design is a static object that can be analysed using different lenses or theoretical perspectives. The implication of this nature is that a structural characteristic cannot cause or produce another characteristic. They just both refer to the same object, each telling something different about the object. Let's mention, e.g., the structural complexity which is not caused by the number of relations in the network: the number of relations in the network is (an attribute of) structural complexity. The number of relations in the network is part of the ontological definition of the concept 'structural complexity'. As a consequence, there is no causal mechanism linking these two.

Thus, in order to find the correct link between STDT and Process-Tracing causal reasoning, we find appropriate to make the link as follows (see Chapter 4 for the details about this theoretical framework):

- Including causal theories other than STDT.
- Consider STDT as necessary contextual condition of this research.

As consequence, and in terms of research priorities, this evaluation study will focus on the causes, contexts and mechanisms in a two-level theory that lead to effective complex team problem-solving within the context of STDT. The temporal scope of the study refers to the actual changed organization structure, which means that at this time only projects with administrative status "in execution" or "finished" can be included in the research. Thus, projects that have not started by December 2018 will not present the progress necessary for this research to be able to trace the causal mechanisms of interest.

3.3. Case selection for process tracing

For this study, suitable ESF "Anders Organiseren" projects were selected. More information on this selection process can be found in chapter 5 (From project to case selection). Data for process tracing was collected from two organizations. Six different teams were interviewed in two rounds of interviews. Each round consisted of two interviews per team. One interview was conducted with two to three team members and in the other interview the team leader was interviewed. In total, 24 interviews were conducted between November 2019 and February 2020.

The goal of the first round of interviews was to identify relevant cases (instances of problems) and have a first description of the problem solving process for each case. Various work-related problems (cf. cases) were discussed. After this fist round, eight cases were selected to study in detail. This selection was based on:

- whether cases are independent: one case does not affect the other;
- the involvement of the whole team or at least multiple team members;
- the learning potential for the organization;
- whether it's a tactical or an operational case: is it related to the strategy of the team (how work is organized in the team) or is it a purely operational issue? We have stated before this research is mainly focused on tactical control;

- whether it's a deviant or a typical case: from a macro-mechanism perspective, are there currently work arrangements concerning the problem (=typical) or not (=deviant)?.

Also, some practicalities were taken into account: the amount of details the interviewees remembered, whether the organizations were easy to contact to find out extra information if necessary, the richness of the evidence (e.g. trace evidence, for example a meeting report, e-mail conversations…).

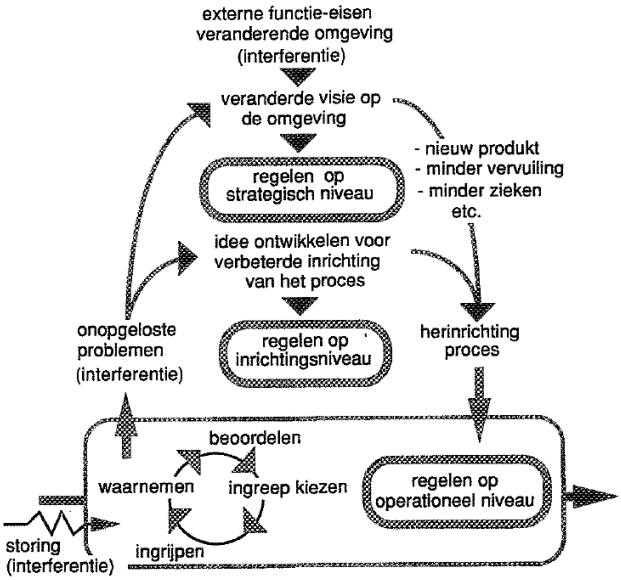
The goal of the second round of interviews was to gather as much information as possible about the selected cases. We focused not only on testimonies of the interviewees, but also on evidence from meeting notes, pictures, documents…

4. Theoretical framework and research questions

4.1. Modern Socio-Technical Organization as context

The "Anders Organiseren" call required organizations to perform an analysis of their organizational processes, and redesign and implement a new organizational macrostructure. These actions can be aligned with **"Socio-technical Design Theory"** (STDT), implying a so-called socio-technical intervention and becoming a **"Modern Socio-technical Organization"** (MSTO). A socio-technical intervention involves the application of a set of design principles that prescribe the creation of service-oriented departments through parallelization, multidisciplinary work units through segmentation, and broad workplaces through the complete job principle. The decentralization principle makes sure that departments have a high degree of autonomy, work units are able to mutually align their work, and professionals can communicate directly with each other. (de Sitter, 1994)

The focus of most socio-technical interventions is to ensure better tactical and operational control within teams. STDT distinguishes between three types of **"control":** operational, tactical and strategic control. This research focuses primarily on tactical control, which can be described as dealing with changes in the work environment by changing the way work is organized (de Sitter, 1994: 102). Tactical control deals with problems that relate to the team task, involves multiple employees and is to be called a social process. The work solutions that result from tactical control focus on changing the way work is organized in the team, and thus imply that the problems faced in the team show some level of complexity. Within Socio-technical Design Theory "control" is conceptualized as a cycle or process that consists of four interconnected activities (see Figure 1): observation of the current situation, situation assessment, action selection (i.e. solution) and implementation (de Sitter, 1994: 92,103). Afterwards, this cycle is repeated to monitor whether the solution was effective.



Figuur 1: Control cycle (de Sitter, 1998)

Starting from the principle of "control" in STDT, we defined the general outcome of this research as **"successful complex team problem-solving".** The rationale is that socio-technical interventions should ensure better tactical control in teams, making teams better able to deal with problems that relate to the team task by changing the way work is organized. For the purpose of this study, these types of problems will be referred to as "complex problems" following up on a "disturbance at the workplace". In order to make the concept of control applicable for Process-Tracing, we reformulate the general evaluation question respectively. This results in the following central evaluation question:

"Why (condition), how (CM) and when (context) do teams succeed to solve complex problems when a disturbance is occurring at the workplace?"

The nature of 'phenomena' used in Socio-technical Design Theory is related to organizations' structural characteristics. An organizational work structure as a design is a static object that can be analyzed using different lenses or theoretical perspectives. The implication of this nature is that a structural characteristic cannot cause or produce another characteristic. Consequently, there is no causal mechanism linking these two.

Thus, in order to find the correct link between STDT and process tracing causal reasoning, we:

- Included causal theories, which are utilized to define the causal mechanisms that will be investigated in this study. An overview of these causal theories can be found in section 4.2 underneath.
- Considered MSTO-characteristics as necessary contextual conditions to the causal mechanisms, meaning that the causal mechanisms are studied within the context of a MSTO. These socio-technical parameters, see table 1, can be used to identify eligible cases to study.

Table 1: Overview of the socio-technical parameters used as criteria to select projects

Parameter	Marker
1. Functional de-concentration (cross-functionality)	a) Do team members contribute to a common output?
	b) Does the operational team task consist of different types of operational activities?
2. Functional de-specialization	a) Is the team task composed of both direct operational and indirect (support and control) tasks ?
3. Division of operational activities (functional integration)	a) Is a considerable part of the team (too some extent) able to operate all direct and indirect tasks?

Source: Own elaboration

4.2. Causal theories and mechanisms for process tracing

As stated before, a structural characteristic cannot cause or produce another characteristic. Consequently, there is no causal mechanism linking STDT with other characteristics. It's necessary to add other causal theories to the theoretical framework. We have chosen to add the theory of "Adaptive Sensemaking", composed of "sensemaking" and "Organizational mindfulness theory".

The link between STDT and this theory can be explained through the concepts of "structural and psychological empowerment". Socio-technical Design Theory is linked to **structural empowerment**: creating space for more ownership deeper in the organization (Marichal & Wouters, 2018). The next step is to make sure employees are able to make the new organization structure work for them. Just because a team is given more autonomy, doesn't mean they are going to use this autonomy the way it is meant to. And even if they use it, will it be recognized by the organization? Organizational mindfulness is linked to **psychological empowerment**: the extent to which employees have the feeling they're doing meaningful work, while having an impact on their environment, being able to act independently and also being capable to do so (Marichal & Wouters, 2018).

The following sections go into detail about the overarching theoretical framework of "adaptive sensemaking" [3], composed of "sensemaking" (Kudesia, 2016) and "organizational mindfulness theory" (Vogus & Sutcliffe, 2012). And the causal mechanisms within this framework.

Sensemaking

Sensemaking can be defined as "[...] the process through which people work to understand issues or events that are novel, ambiguous, confusing or in some way violate expectations" (Maitlis & Christianson, 2014: 57)[4]. Literature on sensemaking distinguishes the following characteristics (Wauters, 2019: 340):

- Sensemaking is a dynamic process.
- Cues (events, issues, actions that are confusing, surprising in need of explanation) are key in triggering the process.
- It is a social process in which individuals and teams interact.

[3] For the mechanistic sketch of Adaptive sensemaking, see annex 2.

[4] See also Maitlis and Christianson (2014: 63) for a more in-depth discussion on definitions of sensemaking.

- It results in an understanding of the environment which is the basis for action (i.e. enactment).

Sensemaking as a social cognitive process which consists of several steps: enactment (perceiving), selection, retention and enactment (behavior). The first step of **enactment** consists of people sharing and discussing information about work, from which cues are identified. Cues can also be identified in the work itself and later shared and discussed. A cue is a puzzling piece of information that cannot be explained based on current knowledge (cf. cognitive dissonance). In this step people ask the question: "What's the story here?". More precisely, based on discussion, discrepancies are identified between what one expects to occur (i.e. "work norms" in STDT) and what is experienced. Labeling events as deviating is called "bracketing" (Kudesia, 2016). Secondly, **selection** comprises the interpretation process of the bracketed information. During the interpretation process, group members collectively reduce the number of possible meanings until a locally plausible story is created and which is regarded collectively as "good enough" to act (Wauters, 2019: 341). According to Kudesia (2016) the immediate outputs of this step are answers to the questions "what's the story here?" and "now what should I do?". Thirdly, **retention** is the process of which the newly created understandings of the work environment are integrated into individual and group identity (Kudesia, 2016). Within STDT this is referred to as the "collective organization memory" (Kuipers et al., 2010: 89). Lastly, **enactment as behavior** entails the group members acting according to their new understanding of the work environment (Kudesia, 2016).

Within and across the process steps, different types of causal mechanisms exist, which are shown in the table below for the steps of enactment and selection.

Table 2: Overview of types of causal mechanisms within sensemaking

Process step	Mechanisms
Enactment as perception	*Pattern recognition to create cognitive dissonance* Pattern recognition concerns noticing new things which involves "seeing both similarities in things thought different, and differences in things thought similar" (Vogus & Sutcliffe, 2012: 516).
Selection	*Cognitive dissonance reduction through collective cognition change* This mechanism entails how people make sense of conflicting beliefs and reconcile their expectations with their experienced reality. (Maitlis and Christianson, 2014: 60)
Selection	*Perspective taking* Ku et al. (2015, p. 94-5) define perspective taking as "the active cognitive process of imagining the world from another's vantage point or imagining oneself in another's shoes to understand their visual viewpoint, thoughts, motivations, intentions and/or emotions". Perspective taking explains how shared mental models (i.e. meaning, understandings) are constructed via a combination of liking (affective), closeness (cognitive-seeing something of others/you in others/you) and cognitive stretch (having to step

	outside usual cognitive routine and spend more energy on information processing) These pre-existing mental models are to be seen as the building blocks or substance of sensemaking (Weber & Glyn, 2006).
Enactment as behavior	*Motivation* The aspect of motivation in Socio-technical Design Theory (STDT) is referred to as 'motivated responsibility' and defined as the active willingness of people to carry the responsibility for the operation of their work and to engage themselves to the fullest (Kuipers et al., 2010: 94). Heedful interrelating is described by Weick & Sutcliffe (2015: 85-86) as a "sharpened sensitivity that involves at least three practices: contribution, representation, and subordination

Source: Own elaboration

Organizational mindfulness

Organizational mindfulness is defined by Vogus and Sutcliffe (2012: 723) as "*the extent to which an organization captures discriminatory detail about emerging threats and creates a capability to swiftly act in response to these details*" (Weick et al., 1999; Weick & Sutcliffe, 2001; Weick & Sutcliffe, 2007). Mindfulness in organizations is described from two perspectives, namely as an organizational attribute and as a social process. As Kudesia (2016: 27) argues, the idea of *mindfulness* can help to understand why some groups are more effective at sensemaking than others.

The link between adaptive sensemaking as a social cognitive process and organization work structure (i.e. STDT) is made evident through the principle of "requisite variety". This is put into words nicely by Ron Westrum (1993): "*a system's willingness to become aware of problems is associated with its ability to act on them*." (in Weick & Sutcliffe, 2012: 66). This implies that when the ability of people to act on problems is increased, the range of issues they can notice is also enlarged. STDT in turn states that effective control over work processes is achieved by ensuring there is sufficient control capacity to deal with demands (de Sitter, 1994: 205). Adaptive sensemaking complements STDT, because it gives a more detailed explanation on how and why disturbances are detected and dealt with by work groups. See also the importance of coaching and leadership in psychological empowerment (Marichal & Wouters, 2018). STDT explains how work activities and responsibilities are organized into a work structure that enables tactical control or problem solving**.** Adaptive sensemaking explains the actual social-cognitive/psychological process of how people think and act within this particular type of work structures.

The figure below shows the general causal framework of this research which contains a context, causes, mechanisms and an outcome. The circle represents the specific context (i.e. scope conditions) in which the mechanisms occur. The cause (i.e. causal condition) represent the triggers that actually start the mechanisms working. The outcome is the result of the causes. The mechanism describes how the causes actually produce or contribute to the occurrence of the outcome. The context, causes, mechanisms, outcome and interrelationships are described in detail in the following paragraphs.

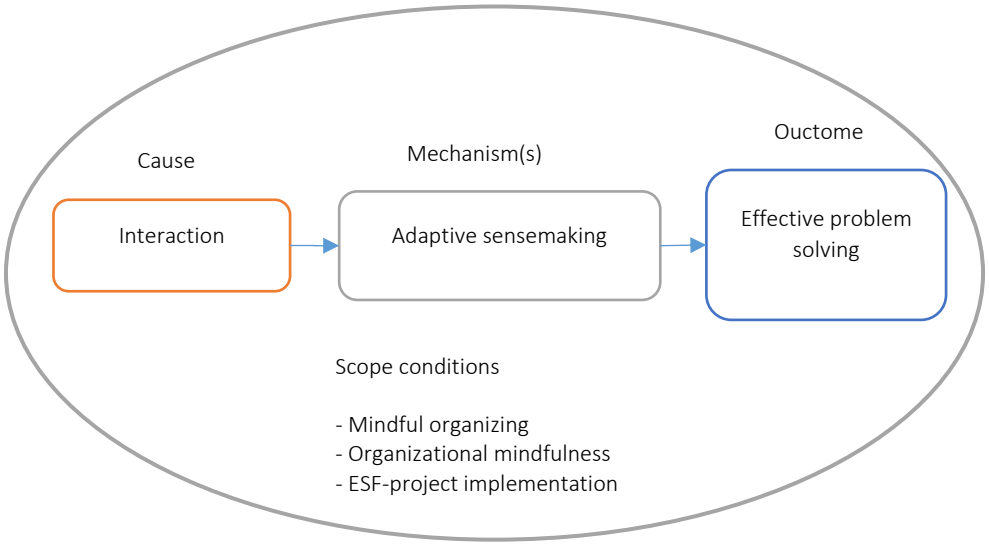


Figure 2: Observable manifestations of Organizational mindfulness

Outcome

In this report we choose to narrow down our outcome, scoping down to literature which is meaningful in relation with the ESF's goal of effectiveness (achievement of intended outcomes) and impact (understood as cause and effect relations between the intervention and a variety of outcomes). Within the team problem-solving literature, the concept of 'successful complex team problem-solving' holds a central position. In the following paragraphs we conceptualize the ontological understanding of this outcome.

The outcome "successful complex team problem-solving" is composed of two attributes, coordinated collective effort and reduced barriers between start and intended goal, that jointly conform a conjuncture that is sufficient to create the concept under study.

Scope condition – ESF-project implementation

The scope condition "ESF project implementation" represents the result of the ESF project regarding the work structure in the organization. The ESF-call "Organizing Differently" subsidizes organizations to redesign their work structure which in ultimately will have a positive impact on job design and employee well-being. The theoretical underpinnings of the call and expected scope of subsidized interventions is sociotechnical design theory.

We define this condition in terms of three structural parameters as used in sociotechnical design theory (de Sitter, 1994; Van Laar et al., 2015). These parameters are used to analyze and design organization structures. The parameter of **functional de-concentration** is the extent in which similar operational activities (tasks) are concentrated in specialized units (and are potentially linked to all orders). **Functional de-specialization** as a parameter represents the extent to which the three fundamental operational functions of 'making' (assembly of a product, delivery of a service), 'preparation' and 'support' are organized in separate units. The parameter of **division of operational activities** is the extent to which operational activities are divided into sub-activities and are organized into separate units. 'Division' can be applied to each of the operational functions.

These three structural parameters also form the three attributes out which this condition is constructed. The table below describes the empirically observable manifestations.

Table 3: Observable manifestations of ESF project implementation

"Unobservable" theoretical level	Empirically observable manifestations
Functional de-concentration	- Team members contribute to a common output - The operational team task consists of different types of operational activities
Functional de-specialization	- The team task is composed of both direct operational and indirect (support and control tasks)
Division of operational activities (functional integration)	- A considerable part of the team is able to operate all direct and indirect tasks

Source: Based on de Sitter (1994) & Van Laar et al. (2015)

Scope condition – Organizational mindfulness

Organizational mindfulness is defined as: "*the extent to which an organization captures discriminatory detail about emerging threats and creates a capability to swiftly act in response to these details*" (Vogus & Sutcliffe, 2012:723 based on Weick et al., 1999; Weick & Sutcliffe, 2001; Weick & Sutcliffe, 2007). The literature (Ray et al., 2011; Vogus & Sutcliffe, 2012) identifies two important properties of organizational mindfulness: 1) it results from top-down processes creating the context for thinking and action on the front line, 2) it is a relatively enduring property of an organization (like organizational culture).

"*Organizational mindfulness is not an intrapsychic process or an aggregation thereof; it is an organizational attribute that is relatively stable and enduring that results from structures and practice implemented by top administrators*" (Vogus & Sutcliffe, 2012: 724). Organizational mindfulness creates the context for mindful action at the frontline through leader-driven top-down processes that result in relatively stable organizational structures and practices (Vogus and Sutcliffe, 2012: 727-728). The middle managers' task consists of translating this macro-level organizational mindfulness into more operational terms within e.g. work teams. The importance of *mindful organizing* (see the next section) is signaled to employees, which produces the motivation to act more mindfully.

The relevance of "organizational mindfulness" as a scope condition is that it results from an intentional organizational policy, is thus managed and can to some extent be manipulated. This way, organizational mindfulness can be regarded as a potential lever for interventions to successfully induce effective problem solving in work teams. Furthermore, organizational mindfulness can predict the occurrence of mindful organizing (see the next section) across the whole organization and makes it less likely that an instance of mindful organizing will be an ad-hoc localized event. As an organizational attribute, organizational mindfulness is expected to exist across the whole organization through employees' perceptions about expected organizational behavior. This way, organizational mindfulness as an institution shapes the behaviors of work team members in the form of more mindful organizing.

Based on the above-mentioned discussion, the main attribute of the concept of organizational mindfulness as an important context for mindful organizing is: consistent enactment of organizational mindfulness by all management levels in the organization (top management and middle management).

Table 4: Observables Manifestations of Organizational mindfulness

"Unobservable" theoretical level	Empirically observable manifestations
Coherent leadership endorsement of Preoccupation with failure	- Leadership insists on updating procedures after experiencing a problem. - Leaders in the organization seek out and encourage information that may be considered "bad news". - Leaders encourage people in the organization to talk freely about problems. - Leaders reward people if they spot problems, mistakes, errors or failures.
Coherent leadership endorsement of Reluctance to simplify	- Questioning is encouraged at all levels of the organization. - People in the organization take nothing for granted. - Leaders encourage people to listen carefully to each other; it is rare that anyone's view is dismissed. - Leaders do not shoot down people for surfacing information that could interrupt operations. - Leaders encourage people to challenge the status quo. - When something unexpected happens, people in the organization are encouraged to conduct a complete analysis of the situation rather than advocate their own view. - People in the organization are encouraged to express different views of the world to leaders. - People in the organization feel free to bring up problems and tough issues to leaders. - People in this organization show a great deal of respect for each other.
Coherent leadership endorsement of Sensitivity to operations	- During an average day in the organization, people come into enough contact with each other to build a clear picture of the current situation. - People are stimulated to help others out whenever necessary. - Leaders pay close attention to the day-to-day operations of the organization . - Should problems occur, someone with the authority to act is always accessible and available, especially to people working on the front lines. - People are encouraged to look for feedback about things that aren't going right. - People in the organization are familiar with operations beyond their own specialty.

	- People have access to resources if unexpected surprises come up. - Leaders constantly monitor workloads to determine the need for additional resources.
Coherent leadership endorsement of Commitment to resilience	- In the organization, resources are continually devoted to training and retraining people in their areas of expertise. - People in the organization are able to rely on others. - People in the organization are known for their ability to use their knowledge in novel ways. - There is concern with building the competence and the response repertoires of the people in the organization. - People have a number of informal contacts that they sometimes use to solve problems. - People in the organization are encouraged to learn from their mistakes. - People in the organization have more than enough training and experience for the kind of work they have to do.
Coherent leadership endorsement of Deference to expertise	- When something unexpected occurs in the organization, the most highly qualified people, regardless of rank, make the decisions. - People in the organization respect the nature of one another's work. - People in the organization value expertise and experience over hierarchical rank. - In the organization the people most qualified to make decisions make them. - It is generally easy for leaders to obtain expert assistance when something comes up that is hard solve directly - People are committed to doing their jobs well. - If something out of the ordinary happens, people know who has the expertise to respond.

Source: Adapted from Ray et al. (2011)

Scope condition – Mindful organizing

Opposed to organizational mindfulness, **Mindful organizing**, is a dynamic process comprising specific ongoing (inter)actions rather than an enduring organizational attribute. Mindful organizing is a social process that relies on extensive and continuous real-time **communication** and interactions that occur in briefings, meetings, updates, and in teams' ongoing work (Vogus & Sutcliffe, 2012: 725) Existing studies on mindful organizing make three different claims (Vogus & Sutcliffe, 2007; Weick & Sutcliffe, 2007: 1) it results from bottom-up processes; 2) it **enacts the context** for thinking and action on the front line, 3) it is relatively fragile and needs to be continuously re-accomplished.

Mindful organizing as a scope condition is conceptualized and measured as a **capability** which is a function of a collective's (e.g., workgroup) attention to context and capacity to act (Levinthal & Rerup, 2006 in Vogus & Sutcliffe, 2012). This collective attention to context and capacity to act is produced through a set of interrelated organizational processes (Vogus, 2011: 665). Taken as a whole, these processes constitute mindful organizing. That is, no single process or subset of processes is sufficient for mindful organizing:

- **Preoccupation with failure** directs attention and effort to complex threats to the system, through proactive and preemptive analysis of potential novel sources of error or conditions that can produce the unexpected (LaPorte & Consolini, 1991; Weick & Sutcliffe, 2007 in Vogus, 2011: 665).
- **Reluctance to simplify** interpretations means that a collective does not take the past as an infallible guide to the future. Instead, team members actively question received wisdom and ensure that key variables are not overlooked by frequently discussing alternatives as to how to go about their everyday work (Fiol & O'Connor, 2003; Schulman, 1993; Weick & Sutcliffe, 2007 in Vogus, 2011: 665).
- **Sensitivity to operations** means creating and maintaining an up-to-date understanding of the distribution of expertise, so that it is appropriately utilized in the face of unexpected events (Weick et al., 1999; Weick & Sutcliffe, 2001 ,2007 in Vogus, 2011: 665).
- **Commitment to resilience** is discussing errors and deriving lessons learned, so that a collective is able to extract the most value from the error data they have (Van Dyck et al., 2005; Weick et al., 1999; Weick & Sutcliffe, 2001, 2007 in Vogus, 2011: 665)
- **Deference to expertise** occurs when, in the face of an unexpected event, a collective of people pools the necessary expertise and utilizes it by allowing the person or people with the greatest expertise in handling the problem at hand to make decisions, regardless of formal rank (Roberts, Stout, & Halpern, 1994 in Vogus, 2011: 665).

The main attribute of the condition of *mindful organizing* we distinguish is: the team capability with regard to the five processes of mindful organizing.

Table 5: Observables Manifestations of Mindful organizing

"Unobservable" theoretical level	Empirically observable manifestations

Preoccupation with failure	- When handing off an activity to another team member, the team usually discusses what to look out for. - The team spends time identifying activities they do not want to go wrong.
Reluctance to simplify	- The team discusses alternatives as to how to go about normal work activities.
Sensitivity to operations	- Team members have a good "map" of each other's talent and skills. - The team discusses the unique skills of team members, so they know who on the team has relevant specialized skills and knowledge.
Commitment to resilience	- The team talks about mistakes and ways to learn from them. - When errors happen, the team discusses how they could have been prevented.
Deference to expertise	- When attempting to resolve a problem, the team takes advantage of the unique skills of the team members. - When a crisis occurs, the team rapidly pools the collective expertise to attempt to resolve it.

Source: Based on Vogus (2011)

Causal condition – Interaction

Within sociotechnical design literature, work meetings are an important instrument to align people performing different work activities and solving work-related problems (de Sitter, 1994: 11-13). However, in this mechanism we take this broader and talk about "interaction" between team members. As previously stated, both *tactical control* and adaptive sensemaking, is a social process. Therefore, an important cause for the mechanism is the existence of interaction in which work activities are discussed among team members. This could be during a recurrent work meeting.

Weick & Sutcliffe (2015:32-33) argument the importance of *organizing* to turn streams of *flux* (i.e. circumstances) into a situation that eventually can serve as a springboard for action. The term 'organizing' should be understood in this sense as a collective effort with the intent to engage in adaptive sensemaking. The same argument for the scope condition 'organizational mindfulness' applies here in that the fact that something is *organized* will make it more enduring and not ad-hoc.

This causal condition is closely linked to the condition of *mindful organizing.* However, this condition presents the actual existence of meeting platforms for group members to come together. E.g. without an actual institution that enables communication, the capability of mindful organizing cannot be put into action.

Table 6: Observable Manifestations of work meetings

"Unobservable" theoretical level	Empirically observable manifestations
Space for systematic detection of deviation or work patterns.	- Meetings are organized within the team, aimed at collectively discussing work experiences collectively and assess possible deviations from expected work situations. - Analytical tools are agreed by the team to observe patterns. - Meetings and tools have an appropriate frequency. - The team spends appropriate amount of time using these tools and meetings.

Source: Based on de Sitter (1994) & Weick & Sutcliffe (2015)

Macro-mechanism adaptive sensemaking operationalized into four mechanisms

For the purpose of this study, the "macro-mechanism" of adaptive sensemaking is further unpacked into four causal mechanisms, which simultaneously occur *within* the process of adaptive sensemaking, and which can then be traced separately.

- **Intuitive pattern recognition** creates cognitive dissonance by discovering information about emerging systemic failure;
- **Cognitive dissonance** reduction through collective cognition change triggers the process of perspective taking, because the issue is put on the agenda and further looked at within the team;
- **Perspective taking** as active cognitive process to understand other's intentions and/or emotions is triggered by cognitive dissonance reduction, because the issue needs solving. The team engages in perspective taking in order to find a solution;
- **Motivation** as 'motivated responsibility': The convincing can be done by other team members then the one that initially detected the problem. Other team members can bring other information to the table that can further strengthen the case to take action for other team members. This is related to the mechanism of perspective taking.

In the next sections, we describe the four causal mechanisms that occur within adaptive sensemaking in detail.

4.2.1. Causal mechanism 1: Intuitive pattern recognition

The first causal mechanism is intuitive pattern recognition. A pattern is a series or sequence that repeats in a certain way. Team members can discover future problems or issues when using intuitive pattern recognition and in this way prevent them from happening (again). This mechanism consists of four parts, elaborated in the following paragraphs.

Start of inquiry

The process of pattern recognition can only be triggered when people interact with each other. Inquiry has to be there throughout the whole process, focused on key domains. The availability of cues is driven by interactions. If people do not interact randomly with each other, the ability to observe concrete situations and their embedded cues will not be random either. Certain cues are more or less likely to appear, depending on the frequency and the nature of the interactions. This is a result of institutional structures which affect the social distribution of actors, cues, identities and frames in a larger social unit. In organisations, functional specialisation and hierarchy and their respective institutional logics clearly affect the distribution of available roles and scripts. (Weber & Glyn, 2006)

This is related to what Weber & Glyn (2006) describe as editing. Sometimes unexpected feedback from others causes surprise, emotional arousal and efforts to restore sense. This derives from the fact that a broader institution (e.g. employment) is typically linked to a whole bundle of identities and situational frames (e.g. different behaviour is expected from an employee in a problem-solving meeting versus a promotion review) with misalignments of situational expectations by various interaction partners leading to perceived illegitimate behaviour.

More relevant for this mechanism of intuitive pattern recognition, is the concept of triggering. Weber and Glyn (2006) discuss how institutions "trigger" sensemaking as they are deficient in some way, leading to a loss of meaning and desire to restore it. The difference with editing is that no other person is needed to cause surprise. Someone is confronted with contradiction, inadequacy or ambiguity within their role and this triggers the process. First, institutionalised expectations may be contradictory between or within institutions e.g. when two different identities suggest two conflicting performance expectations, e.g. as with a doctor who should be at the same time a healer, an administrator as well as socio-medical professional. Second, they may be ambiguous e.g. the same performance expectation may indicate different identities or frames. Third, institutions may simply become inadequate. Symbols and patterns of behaviour that used to be associated with a role gradually become associated with another (e.g. owning a car used to be a sign of belonging to the upper class, until Henry Ford came along). Another example of inadequacy is when an individual moves from one role to another, e.g. a promotion from employee to manager. While the institutional expectations for both roles are not dynamic, sensemaking may be required around the changed identity of the individual.

Weber and Glyn (2006) draw attention to the nature of institutions as typifications. Typification implies that identities and situations are always selected and incomplete ways to access actor and situation-specific flows of experience. Hence, they will inherently produce gaps, ambiguities and puzzles. However, when actors who carry contradictory institutions do not interact, then these institutions continue to work smoothly. Only when brought into proximity is creative sensemaking triggered.

Gathering information and mentally browsing information

Stigliani and Ravasi (2012) find that the process (cf. here we relate this to the process of intuitive pattern recognition) starts with the purposeful exposure of team members to experiences (interviews, field observations, casual browsing of magazines, etc.). Team members deliberately attempt to record relevant "chunks of experience" in material forms (e.g. pictures, images, objects accumulated via filming, photographing or interviewing) to share with the rest of the team, making them permanently available for later cognitive work. This is mostly individual work.

In this context, Weick and Sutcliffe (2007) firstly discuss two different modes of perception:

- Direct: knowledge is developed via hands-on exploration where there is a bottom-up stimulus-driven cognitive processing concurrent with acting;
- Conceptual: knowledge is developed by description, with cognitive processes schema driven. Here, we go beyond the information that is given and we elaborate direct perceptions into types, categories, stereotypes and schemes that mobilize habitual action (by association).

Weick and Sutcliffe (2007) assert that, in the interest of coordination, people shift from perceptually based knowing to categorically based knowing because of the need to share cognitive structures. The more there are demands for coordination (due to increasing social complexity), the more people begin to experience intellectual and emotional distance from the phenomena picked up by direct perception. Here lies the issue with "reporting". For something to be reportable, people need to have words and categories at hand, which themselves limit what is seen and reported. We use our categories to punctuate a stream of experience into familiar events and a residual. The world is thereby rendered more stable and certain but this overlooks unnamed experiences that could be symptomatic of trouble.

Two characteristics of a High Reliability Organization (HRO) are important in the context of intuitive pattern recognition:

1. **Preoccupation with failure**: Directs attention and effort to complex threats to the system, through proactive and preemptive analysis of potential novel sources of error or conditions that can produce the unexpected (LaPorte & Consolini, 1991; Weick & Sutcliffe, 2007 in Vogus, 2011: 665).
    a. When handing off an activity to another team member, the team usually discusses what to look out for.
    b. The team spends time identifying activities they do not want to go wrong.
2. **Sensitivity to operations**: Creating and maintaining an up-to-date understanding of the distribution of expertise, so that it is appropriately utilized in the face of unexpected events (Weick et al., 1999; Weick & Sutcliffe, 2001, 2007 in Vogus, 2011: 665).
    a. Team members have a good "map" of each other's talent and skills.
    b. The team discusses the unique skills of team members, so they know who on the team has relevant specialized skills and knowledge.

Narrow attention to a few select issues may reduce the ability to detect subtle changes in both existing and emerging issues. However, to learn from such changes, non-salient, peripheral and potentially irrelevant cues of small adjustments need to be noticed and their distinctiveness retained in a new category, rather than lost in an existing one. In addition, the more the work is subdivided, the more there is a danger of confusion and a need for coordination across the divisions. This is why the process stresses "key domains", so that people are able to record fine-grained information.

To Rerup (2009), dealing with these issues, from an attentional perspective, requires:

- Attentional stability: a deep but relatively narrow awareness of what goes on in a specific context, gained by multiple repeated and focused scans of a few key issues over time. An issue's complexity and cues of danger are seen only when the issue is looked at with accuracy and discipline over time;
- Attentional vividness: this concerns a rich but relatively broad awareness of what goes on in a specific context. Vividness is realised when the mind focuses on several objects or issues at the same time, as this awareness is derived from relationships between parts, not parts themselves.

Nonaka and von Krogh (2009) point out that one can shift between the awareness of a task and of a tool. Likewise one can reflect on one's experiences, using language to remind oneself of what one already knows, thematize certain circumstances and discuss these with others. Each individual practitioner brings a different biography into this process, with fresh ideas, insights and experiences that allow them to reflect on events and situations. It is practitioner diversity that is the source of innovation. Thus, organisational knowledge creation aims at expanding boundaries by including more practitioners with different knowledge and interests, representing different social practices. Here, social identity is tied not merely to one existing practice but it emerges for those groups that are engaged in organizational knowledge creation, across practices.

The next step in knowledge creation, according to Nonaka and Toyama (2003), is the process of "externalization". This process involves individuals using their discursive consciousness to try to rationalize and articulate the world that surrounds them, yielding concepts, images and written documents. The particular process of interaction is then "dialogue". Here contradictions among tacit knowledge of individuals or between one's tacit knowledge and structure, are made explicit and synthesized. To make a hidden concept or mechanism explicit, abduction/retroduction (inferring the best explanation, which is a creative process) is used. The sequential use of metaphor, analogy and model (using words as well as visually) is a basic method in this form of reasoning.

Stigliani and Ravasi (2012) relate innovation to prospective sensemaking, where a future state is imagined and how to relate to it, is investigated. Compared to research on crises, such prospective sensemaking is rather a slow process where refinements of emerging interpretations result from cycles of sensemaking and sensegiving, as group members attempt to influence other actors' interpretations. The mechanism of intuitive pattern recognition shows this as a dynamic process between gathering information and mentally browsing this information.

Integration (bracketing information leads to new insights)

Weick et al. (2005) state that noticing derives from a combination of pre-existing mental models (acquired during training, work and life experience) and a salient cue. It is retrospective in nature. For example, at 11 a.m. a nurse notices vital signs of a baby that she doesn't consider normal. These symptoms are not discovered at 11 a.m., they are created at 11 a.m. by looking back over earlier observations and seeing a deviant pattern. This means that an act is never considered deviant, it only becomes deviant in hindsight. To Weick et al. (2005), stopping and asking "what's the story here?", which is the same as asking "same or different?", actually brings the event into existence. When a situation feels different, this does not have to be a threat, it can also be an opportunity to discover possible failure.

These pre-existing mental models are to be seen as the building blocks or substance of sensemaking (Weber & Glyn, 2006). The content of an institution is conceptualised as a constellation of "identities"

(typified actors), “frames” (typified situations) and “actions” (typified expectation of performance or conduct). The combination of identity and frame corresponds to the above-mentioned concept of a “role” as a “typified actor in a situation”. The combination of frame and actions corresponds to the earlier mentioned “script” as “typified actions in a situation”. This is depicted in the figure below and illustrated by an example regarding employment.

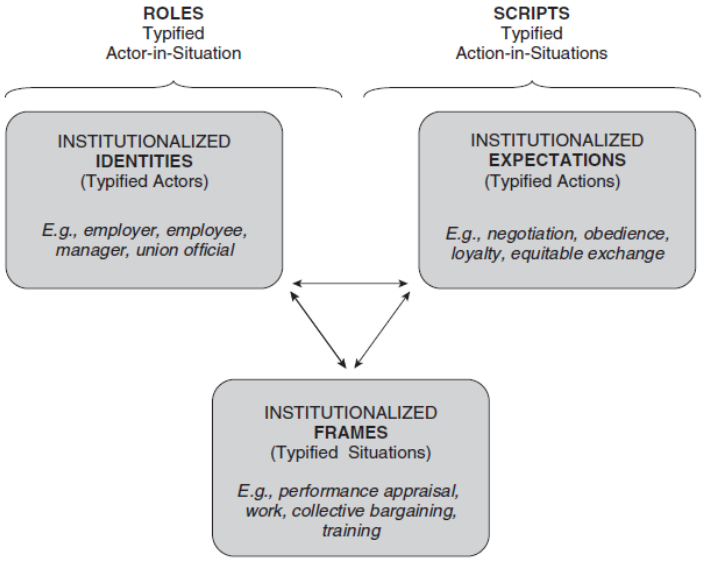


Figure 3: Identitites, expectations and frames (Weber & Glyn, 2006)

The example in the figure broadly frames employment as a contract between a person and a legal entity for the exchange of labour and benefits, with expectations of supply and allocation of work by the employer and performance of duties by the employee. Weber and Glyn (2006) state that an alternative framing could consist of a communal relation with an employer as a natural person (e.g. when family members are active informally in a business). More locally, there are more specific roles and scripts. For example expectations regarding the behaviour of a manager will be different depending on whether the situation is framed as performance evaluation (an employee appraisal meeting) versus instruction/development (a training session).

Weber and Glyn (2006) in this way make clear exactly how institutions and sensemaking are interwoven. First, sensemaking, as discussed earlier, is interwoven with identity construction. What is sensed and how it is interpreted bears on our identity and relates to the sensemaking question of “who am I?”. At the same time, sensemaking is social, as identities specify relations with other identities (e.g. employee implies an employer). Hence, our behaviour is contingent on a web of relationships among different identities. Second, it is the situational frames that relate to the key sensemaking question “what is going on here?”. Third, frames and identities come with expectations of how actors should perform these identities in a specific situation, relating to the key question “what should I do?”.

The reason why some problems in organisations are less likely to get noticed, is priming. Weber and Glyn (2006) elaborate how institutions prime sensemaking, because they serve up a limited register of typifications (identities, frames, expectations) that can be used to construct a course of action. In connection to this register, certain (verbal or sensory) cues are more likely to be noticed. We describe this as an institutionalised attention structure. This results in noticing things that are related to the mental models we possess and acting on it in a certain way.

Weick and Sutcliffe (2006) also stress the power of associative thinking. We select distinctive marks, employing our systems of categories, from objects, ideas, situations, people we encounter, and associate these to our own responses. When similar encounters recur, they are associated with earlier selected marks and then with our original or strongest response to them. This associative functioning serves a purpose as we do not have to use energy for each step in this sequence for every encounter. But it also carries a grave danger:

- Perpetuating and strengthening faulty or incomplete first observations, errors of judgement and emotional prejudices (such as hate or pride);
- What may have been sufficient to deal with one particular situation may prove inadequate for another;
- An instinctive dislike may be felt for things, places or persons without there being any actual connection to a previous unpleasant experience that these become associated with.

To be able to notice emerging systemic failure in organizations, being aware of priming and associative thinking is important. Only by being open to other mental models and engaging in inquiry, this process of intuitive pattern recognition can be successful in detecting systemic failure.

Crossan et al (1999, p. 525), drawing on Weick (1995), define "intuiting" as the "preconscious recognition of the patterns and/or possibilities inherent in a personal stream of experience". This is a uniquely individual process. There are two distinct views of how intuition works: expert versus entrepreneurial intuition. In the former, pattern recognition is tied to expertise, where the expert, having been in similar situations in the past recognizes a pattern and hence knows, almost spontaneously, what to do. Expert intuition has to do with recognizing similarity and hence supports exploitation. However, "entrepreneurial" intuition focuses on recognizing difference. Indeed, while patterns may be similar, they are never identical. Entrepreneurial intuition focuses on the difference in what otherwise would be seen as similar, enabling entrepreneurs to make novel connections and discern new possibilities. It supports exploration. In other words, expert intuition is past pattern oriented while entrepreneurial intuition is future possibility oriented.

For Crossan et al (1999), entrepreneurial intuition is therefore what generates new insights. These are not wrong or right, but simply possibilities. They initially come to the fore as hunches, feelings and/or sensations. This can be stimulated by a long period of immersion in a problem, followed by a brief period of disassociation of the specifics of the problem. Imagery (visions) and metaphor also matter in this process, since no language exists yet to adequately describe the insight and the connected intended action (it is pre-verbal). Images about possibilities can be further developed as metaphors. Such images are vague when it comes to generating specific action. At this stage, action is still improvisational, rooted in feeling rather than thinking. A metaphor can transfer information from a relatively familiar domain to a new one. It is used to bound and describe the insight while still remaining imprecise and vague when it comes to explaining action.

Table 7: Mechanism Intuitive Pattern Recognition

Cause	Part 1	Part 2	Outcome
Start of inquiry	Gathering information	Mentally browsing information	Integration (bracketing information leads to new insights)
Team members systematically and intentionally* engage in inquiry with relevant information sources*, concerning what is going on in a critical domain*, with the intent to uncover signs of potentially systemic failure* early on.	Team members memorize or record a broad* range of "chunks of experience"* concerning (past) events, context variables… in a sufficiently fine-grained* way, including their own early interpretations as reflecting their possible biases.	Inquiring team members mentally browse (some of) the retained information in a variety of ways*, while continuing to add new information from ongoing probing, from others within or outside the team.	With the addition of a piece of information, a hunch* suddenly emerges (from the team members' sub-conscious) that this new information, in the context of the retained information*, is indicating an emerging systemic failure.
Definitions			
- **Systematically & intentionally:** the inquiry doesn't only happen ad hoc, but there are repeated and planned moments where inquiry can happen - **Relevant information sources:** colleagues inside or outside the team, other stakeholders, raw data (e.g. statistical process chart)… - **Critical domain:** team members do not scan all aspects of the organization, but rather focus on a few key issues that are vital for the organization where one does not want anything to go wrong - **Signs of systemic failure:** Small failures (deviations) that over time compound into a crisis, resulting in an organization's whole system failing	- **Broad:** attentional vividness = a rich, but relatively broad awareness of what goes on in a specific context. The mind focuses on several objects or issues at the same time, looking at the relationship between parts, not parts themselves (Rerup, 2009). - **Chunks of experience:** pieces of information, gathered by team members through interviews, field observations, casual browsing of magazines, etc. Team members see, feel or hear things, they are open to all kinds of information, including what others deem irrelevant - **Sufficiently fine-grained:** attentional stability = a deep, but relatively narrow	- **A variety of ways**: using attentional vividness and attentional stability to explore what is already gathered in depth and breadth (see "broad" and "fine-grained" in part 1)	- **A hunch**: a feeling or guess related to a cue - **Cues**: events, issues, actions that are confusing, surprising, in need of explanation in the context of the information that has been retained already. This new information results in surprise and the feeling that something is going wrong. It feels like a signal that systemic failure is emerging - **Retained information**: information that has been memorized or materialized (see "chunks of experience" in part 1), categorized in a critical

	awareness of what goes on in a specific context. Key issues are looked at multiple times over time. Cues of danger are seen only when the issue is looked at with accuracy and discipline over time (Rerup, 2009).		domain and thus estimated as important
Conditions			
- **Preoccupation with failure:** Those who engage in such an inquiry assume the system is always at risk for failure, which is why they watch out for challenging situations and small failures that could compound into a system crisis that's hard to avoid (collapse of the organization). - **Defining systemic failure**: team members should be aware of what systemic failure is, in order to be able to identify cues - **Reciprocity**: insights about systemic failure don't necessarily belong to the inquiring team member, another team member - who's for example only sharing information - could also be the one gaining insight - **Safety culture**: inquiry is supported by the organization, team members feel like they can speak freely about issues, moreover reporting issues is encouraged and rewarded - **Variation in mental models**: those who conduct inquiry have a rich background of experiences or at least a very different one to those they engage with - **Critical domains are specified**: In order to engage in inquiry, the important domains where one does not want this to go wrong need to be specified in the organization, so that team members know what they should question.	- **Preoccupation with failure** - **Defining systemic failure** - **Reciprocity** - **Being aware of unconscious bias**: team members search for information, while being aware of possibly starting to interpret/judge this information before knowing what is going on	- **Preoccupation with failure** - **Defining systemic failure** - **Reciprocity** - **Dynamic process**: the more team members engaged in the inquiry, the quicker someone will link this to an emerging system failure (the feeling that something is not right). As long as this doesn't happen, the gathering of information goes on (back to part 1). This is what the arrows represent.	- **Preoccupation with failure** - **Defining systemic failure** - **Reciprocity**

4.2.2. Causal mechanism 2: Cognitive dissonance

What is cognitive dissonance?

According to Festinger (1957), dissonance is a negative affective state that results from an individual experiencing two discrepant cognitions. These cognitions could be any mental representation, opinion, such as attitudes, beliefs, or knowledge of one's own behavior, about oneself or about the environment (Festinger, 1957; Hinojosa et al., 2017). Two main basic hypotheses are raised:

1. The dissonance as such, is psychologically uncomfortable, and will motivate the individual to try to reduce it and achieve 'consonance';

2. Beyond trying to reduce dissonance, individuals will actively avoid situations and information that could increase the dissonance (Festinger, 1957).

The process of cognitive dissonance reduction

The process of cognitive dissonance reduction will enable other processes to lead to complex problem-solving within the team. Festinger describes some ways in which the dissonance can be reduced or eliminated. The usual way is by changing one of the elements in dissonance. However, the process is not that simple. Depending on the type of cognitive elements involved in the dissonance and on the total cognitive context, Festinger states three main ways to deal with dissonance:

1. Changing a behavioral cognitive element: changing the action or feeling which the behavioral element represents;
2. Changing an environmental cognitive element: changing the 'situation' to which that element corresponds;
3. Adding new cognitive elements: the individual will actively seek new information that would reduce the total dissonance and, at the same time, avoid new information that might increase the existing dissonance.

This third way to deal with dissonance is used in our mechanism, because we look at the team structure and interactions that happen within and outside of the team. These interactions enable the team members to find new information that can reduce the dissonance. Festinger also puts dissonance in the context of post decision-making. The argument is that decision-making has inevitable consequences for the dissonance and to understand this, it's important to focus on the factors that affect the magnitude of dissonance. For example, the importance of the decision, the relative attractiveness of the unchosen alternative…

According to Festinger, there are three methods for reducing dissonance:

1. Changing one's own opinion;
2. Influence others to change opinions;
3. Make the other person non-comparable to oneself.

Festinger argues that a human being always tries to establish internal harmony among opinions, attitudes, knowledge, and values. Therefore, there is a drive toward consonance between cognitions. Thus, when two relevant cognitive elements are in a dissonant relation, the magnitude of the dissonance will be high and the individual will engage in a process to try to reduce the dissonance.

Mechanism

The theory of cognitive dissonance is translated into a complex mechanism to study the dynamic transmission of causal forces through it to produce the outcome which is cognitive dissonance

reduction. We reconceptualize the theory as two mechanisms (two pathways). When starting with voluntary exposure to information, within the context of 'high magnitude of dissonance' the process can evolve via the pathway of building support until the outcome is produced (pathway 1) or the process can end if the magnitude of dissonance is low (pathway 2). In the second pathway, dissonance is not reduced, but the team member can live with that because the magnitude of the dissonance is not as strong to motivate him/her to search new ways to reduce it.

The causal mechanism is expected to be present in the population of cases of Flemish firms when the scope conditions relating to high magnitude of dissonance and team learning from experience are present.[5]

[5] The full text of this theory can be found in Annex 3.

Table 8: Mechanism cognitive dissonance

Cognitive dissonance reduction causal mechanism - Ideal type							
(1) Pathway: Search for information and talking to the team (linear sequence)							
Difference with other pathway: magnitude of dissonance is high							
	Cause – Motivational force as a sense of urgency	**Pathway**	**Voluntary exposure to information**			**Building social support**	
			Part 1	**Part 2**		**Part 3**	**Part 4**
(When the institution has a policy of direct/indirect communication (hybrid); team is semi-autonomous; trust)	Due to the dissonance caused by 'unexpected events' [violation of expectations] at work, individual team member feels pressure to reduce it because he/she is aware that unresolved dissonance could interfere with (1) his/her effective job performance' and group performance, and (2) because it is psychologically unpleasant.	***Search for information***	Individual team member **seeks out** information about the sources of this 'cognitive discrepancy' (the salient cues not prevented by the current mental models) - by collecting material with the expectation to achieve consonant cognition with the existing cognitive elements.	Individual team member **identifies** some dissonant-increasing new information: 'actual signs of trouble deserve closer attention'.	***Dissonance is not reduced, so the next pathway is talking to team members to reduce cognitive dissonance***	Due to this increase of dissonance, individual **team members search** for social support - by **communicating** the perceived signs of trouble to other **peers** - in order to know what to do.	**Team members listen** to each other about their concern and **agree** that, even if a long-term solution is imperative for this cue, some urgent measures need to be implemented, because the cue has escalated. This means the problem is more serious than previous experiences and some measures need to be implemented with urgency.
Contexts for this pathway	High magnitude of dissonance (Festinger, 1957)			Magnitude of dissonance is increased (Festinger, 1957)			

	Common awareness intention	**Uniform reaction**	**Pathway in linear sequence**	**Uniform reaction**	**Elephant in the room**		**Reducing discrepancy**	**Outcome - dissonance is reduced**
	Part 5	**Part 6**		**Part 7**	**Part 8**	**Part 9**	**Part 10**	
(When the institution has a policy of direct/indirect communication (hybrid); team is semi-autonomous; trust)	Due to this escalation, some kind of common awareness is established within the team about the possible slippage of the cues if they are not managed in time and the bad consequences for the team performance. Thus, using this argument, team members craft some kind of solutions they can provide individually from their autonomy [e.g. re-planning].	As they are searching for solutions, **team members debate** that such solutions are not sustainable for a long-term period producing a uniform within-team reaction that some actions need to be taken and approved by the team leader because of his authority, expertise and/or experience.	***Dissonance is not reduced, so next pathway talking to team leader to reduce cognitive dissonance***	**Team members decide to communicate** their concerns to the team leader about their preoccupation with failure, in order to search for a final solution to the escalated problem. The solution can be top-down (team leader proposes a solution) or bottom-up (the team proposes a solution).	Team leader **listens** and **notices** that the issue is important for the whole group and deserves attention. (team leader cannot pretend that nothing is wrong and the rest of his/her team knows there is - it can be really problematic).	**Team leader confirms** the importance of the problem and **manages** the discussion by proposing some kind of problem-solving setting with the whole team as a way to increases the likelihood of recovery and continuing reliable performance. This leads to a process of perspective taking (see next mechanism).	Team members **agreed** with the proposal to engage in whole team problem-solving because they feel listened to/taken seriously as the issue is put on the agenda by the team leader for its resolution.	Total dissonance is reduced, internal balance/harmony is restored because the 'perceived issue' is on the agenda for solution. The cognitive discrepancy is reduced although not yet eliminated.

Cognitive dissonance reduction causal mechanism - Ideal type					
(2) Pathway: Search for information					
Difference with other pathways: the magnitude of dissonance is low and the process ends with dissonance that is not reduced					
	Cause- Motivational force as a sense of urgency	**Pathway**	**Voluntary exposure to information**		**Outcome - End of the process**
			Part 1	**Part 2**	
(When the institution has a policy of direct/indirect communication (hybrid); team is semi-autonomous; trust)	Due to the dissonance caused by 'unexpected events' [violation of expectations] at work, individual team member feels pressure to reduce it because he/she is aware that unresolved dissonance could interfere with (1) his/her effective job performance' and group performance, and (2) because it is psychological unpleasant.	***Search information***	Individual team member **seeks out** information about the sources of this 'cognitive discrepancy' (the salient cues not prevented by the current mental models) - with the expectation to achieve consonant cognition with the existing cognitive elements.	Individual team members **identify** some dissonant-increasing new information : 'actual signs of trouble deserve closer attention'.	End of the process. Dissonance is not (completely) reduced, but team member can live with that because the magnitude of the dissonance is low and he/she can go back to his/her routine.
Contexs for this pathway	High magnitude of dissonance (Festinger, 1957)			Magnitude of dissonance is low (Festinger, 1957)	

4.2.3. Causal mechanism 3: Perspective taking

What is a work perspective?

We define a "work perspective" as an individually held mental representation (cf. image, map, framework, model) about the work organization of the team. The scope of a work perspective consists of more than the individual job function and involves the whole work organization. This scope of work perspective is relevant because the team process we are interested in is tactical control. Tactical control deals with problems that relate to the team task, involves multiple employees and is to be called a social process. For the structural perspective, tactical control is about task interdependencies, i.e. a focus on exchange relationships between the job functions in the team. For mindful organizing it is about more (goal/knowledge interdependence).

Perspective taking is a cognitive process and is to a large extent driven by the cognitive capacity of the individuals involved. Cognitive complexity is the causal power in the perspective taking mechanism. Ku et al. (2015: 83) identify cognitive complexity as the human ability that drives (cognitive) perspective taking. Because perspective taking as a collective social process requires interaction, a necessary condition for cognitive complexity being able to produce a social/collective outcome is motivation to engage in social behavior. In general, low cognitive complexity is characterized by rigid black-and-white thinking, being intolerant for uncertainty and ambiguity, having a desire for rapid closure, and not recognizing the validity of other viewpoints. High cognitive complexity is characterized by flexible, broad thinking that recognizes multiple aspects and different possible interpretations of an issue and identifies connections and (dynamic) tensions between perspectives (Békés & Suedfeld, 2019: 1).

Certain aspects within a perspective can be unclear, incoherent or conflicting. Weber and Glyn (2006) draw attention to the nature of typifications. Typification implies that identities and situations are always selected and incomplete ways to access actor and situation-specific flows of experience. Hence, they will inherently produce gaps, ambiguities and puzzles. However, when actors who carry contradictory codes do not interact, then these codes continue to work smoothly. Only when brought into proximity is creative sensemaking triggered.

With regard to activities, Litchfield and Gentry (2010: 193-194) distinguish three dimensions or types of behaviors (cf. 'patterned activities') related to perspective taking as an organizational capability, namely cognitive, affective and perceptual perspective taking.

1. **Cognitive perspective-taking** taps into knowledge of other perspectives but does not require active consultation of another's perspective (cf. perceptual perspective-taking). Within organizations, people most often do know something about the knowledge of others with different functions (hence perspectives), even when they do not actively use this knowledge. It forms the conceptual core of individual perspective taking and takes a central role in an organizational capability: "Organizations might be said to engage in cognitive perspective-taking when they have established patterns of action where members routinely consider specific other perspectives that are relevant to their work, imagine how the holders of those perspectives think, and then either take these views into account or make a decision to ignore them after consideration." (Litchfield and Gentry, 2010: 193).

2. **Affective perspective-taking** as an organizational capability consists of established patterns of action where members view other perspectives as legitimate and worthy of respect. Organizations can develop cultures that emphasize knowledge of and respect for others' feelings while remaining relatively low in behaviors that might be associated with cognitive perspective-taking (Litchfield and Gentry, 2010: 193).

3. **Perceptual perspective-taking** in organizations consists of patterns of action where members routinely use communication and information systems or other perceptual devices to inquire about other perspectives. . These devices can e.g. be dash boards of metrics representing other perspectives or simply ask others to describe their perspectives directly or via email. In social settings, perceptual perspective-taking has an important function as a mechanism for inquiring across perspectives and identify and adjust possible conflicts or unclarities (cf. 'boundary objects' in Litchfield and Gentry, 2010: 193).

The causal mechanism

In sequential terms, Litchfield and Gentry (2010) posit that people in organizations will first engage in cognitive or affective perspective taking in isolation and will only inquire directly into other perspectives (cf. perceptual perspective taking) when isolated perspective-taking is perceived as inadequate and perspective-taking is viewed as important.

The mechanism of perspective taking starts with the detection of a disturbance. The team member asks her-/himself the question, how are going to deal with this problem? How are we going to organize ourselves to deal with this situation? Because it is a collective problem (cf. interdependence) the team member thinks in terms of the team work organization (cf. structure) and not only just for his individual job function.

Next, the team member is going to contact the other team members. Driven by the inability to explain the problem situation and the awareness that the problem is located at the team level, the team member contacts others in the team. The request is made out of a need for additional information to be able to make a more complete explanation.

After that, the team members share their experiences. This sharing can be done by different team members (not just the team member who made contact). The initial contact can trigger other team members to share other experiences perceived as relevant (cf. similar or different but related). Experiences are shared on how they actually experience(d) the situation, however next the link is made with the team work organization (in terms of cause or solution).

Having listened to each other's pending view of the situation, team members deepen their understanding of each other's perspectives by:

- identifying new cues within others' (accounts of) experiences through application/interpretation of one's own perspective, ...
- identifying new cues within one's own experiences through the application/interpretation of other team members' perspectives.

Similarities between perspectives are identified as cues/experiences (from different team members) relate to similar categories within different perspectives. Differences between perspectives are identified as cues/experiences (from different team members) are not relatable to similar categories within different perspectives. Contradictions between perspectives are identified as similar cues apply to different categories within different perspectives.

The solution is coherent with how team members understand the problem situation, logically connecting the solution with the cause of the problem. E.g. if the problem is caused by how the team make the collective work planning, improving client communication is likely not to be relevant nor adequate to improve the planning method.

Adequacy and relevance do not necessarily mean that an individual team member is personally convinced that this is the best or most efficient, effective or optimal solution possible. However, individual team members need to be convinced (cf. makes sense logically) that it might work.[6]

[6] The full text of this theory can be found in Annex 4.

Table 9: Mechanism Perspective Taking

Cause	Part 1	Part 2	Part 3	Part 4	Part 5	Outcome
Team member detects a disturbance during the operation of her/his work activities.	The **team member** **tries to find** an adequate explanation (cf. to make sense) for the observed disturbances in terms of the team work organization (drawing on her/his existing knowledge about the work organization) that enables her/him to design an adequate solution but **is unable** to do so.	The **team member** **contacts other team members** to explain and discuss the problem situation in order to find an explanation that enables an adequate solution.	**Team members** **share** their experiences (cf. exemplars) with problems, their pending explanation of the problem situation in terms of the work organization and **facilitate** mutual understanding.	**Team members** **discuss each other's** experiences and explanations by **identifying** similarities and differences (incl. contradictions) between explanations in terms of the problem and solution.	**Team members** **propose and discuss collective solutions** (using pending individual understandings of the problem situation and solution within the team) **and reach agreement** based on convergent individual perceptions of the solution at least being relevant and adequate* in solving the problem situation. *The solution is consistent with how a team member understands the problem situation.	Team members hold a shared perspective on what needs to be done.
Relevant concepts *The causal story*	**Heedful interrelating** **Cognitive perspective-taking** **Differentiation**	**Perceptual perspective-taking**	**Perceptual perspective-taking** **Affective perspective-taking** **Collective differentiation**	**Affective perspective-taking** **Collective integration**	**Cognitive perspective-taking** **Collective integration**	
Observable manifestations: see annex						
Conditions						
(MO* = Mindful organizing)	MO * - Reluctance to simplify	MO * - Deference to expertise	MO * - Reluctance to simplify	MO * - Reluctance to simplify	MO* - Commitment to resilience	

4.2.4. Causal mechanism 4: Motivation

Motivation in STDT

The aspect of motivation in Socio-technical Design Theory (STDT) is referred to 'motivated responsibility' and defined as the active willingness of people to carry the responsibility for the operation of their work and to engage themselves to the fullest (Kuipers et al., 2010: 94). According to Kuipers et al. (2010) motivated responsibility has a lot to do with the concept of 'engagement'. Kuipers et al. (2010: 95-96) argue that motivated responsibility rests on three mental pillars:

- To choose: the feeling that one makes her or his own choices and is not being forced by others or by the circumstances.
- To want: the feeling that one makes an effort based on their own will and is not being forced or incentivized by others.
- To participate: the feeling that one can contribute to the image and vision (cf. policy) of the organization and that this image is not being imposed by leadership.

The opposite of engagement is alienation (Kuipers et al., 2010: 101): alienation is the result of a work situation in which it is impossible 1) to the see the use of your own contribution to the whole and 2) to be able to influence the success of the whole based on your own insight.

The main body of literature (Kudesia, 2017; Maitlis, 2005; Vogus & Sutcliffe, 2012; Weber & Glynn, 2006; Weick & Sutcliffe, 2015; Weick, Sutcliffe & Obstfeld, 1999) we consulted on organizational mindfulness and sensemaking surprisingly contains little information on motivational factors. An important concept in the literature of organizational mindfulness that we can link to work engagement as motivation is heedful interrelating (Weick & Sutcliffe, 2015: 85-86). Heedful interrelating is described by Weick & Sutcliffe (2015: 85-86) as a "sharpened sensitivity that involves at least three practices: contribution, representation, and subordination."

Both STDT and organizational mindfulness refer to some extent to the concept of intrinsic motivation. However, the concept of motivation is better elaborated in specific work on motivation theories such as work engagement. "Work engagement is a positive, fulfilling, affective-motivational state of work-related well-being" (Leiter & Bakker, 2010:1). Gagné & Deci (2005) state that self-determination theory distinguishes between amotivation (lack of motivation) and motivation. Amotivation means not having an intention to act, whereas motivation comprises intentionality. There are two types of motivation: autonomous and controlled. Autonomous motivation includes intrinsic motivation (having an interest in an activity itself) and well-internalized extrinsic motivation (the value of the activity has been integrated with one's self) (Gagné & Deci, 2005).

Synthesizing existing theory, Macey and Schneider (2008) argue engagement can be conceptualized as a trait, a state, and a behavioral tendency (in Gagné, 2014: 42). The relationship between these three engagement concepts is clarified by the working definition of Meyer et al. (2010: 64 in Gagné, 2014: 43): "Engagement is experienced as enthusiasm and self-involvement with a task or collective (e.g. organization), is fostered by a corresponding dispositional orientation and facilitating climate and manifests itself in proactive value-directed behavior."

We argue that work engagement as a state acts as a driver for problem solving behavior (as a specific form of behavioral work engagement). More specifically, work engagement can explain why individual team members want to tackle work related problems as they are committed or dedicated to their work activities and goals. Work engagement reflects personal commitment, personal energy and intense involvement (Leiter & Bakker, 2010: 2). A prominent operational definition of work engagement as a state is: "a positive, fulfilling, work related state of mind that is characterized by vigor, dedication, and absorption" (Schaufeli, Salanova, González-Romá, & Bakker, 2002, p. 74). Work

engagement has the causal capacity that drives problem solving behavior in the mechanism (cf. engagement as behavior).

Within the model of Macey & Schneider (2008: 6, 14), engagement can (also) be conceived as directly observable behavior in the work context. These are the kind of activities team members (as actors) will undertake in the motivation mechanism:

1. **Seeking team resources by engaging other team members:** Help-seeking behavior, such as feedback or information seeking, can be a type of proactive behavior enacted to gain specific resources (Petrou et al., 2012). In the context of this research team members will have to rely on each other to solve a tactical problem as this type of problem implies interdependency. Seeking behavior will thus consist of communicating the problem to the rest of the team and requesting them to get involved in a specific way that is required by the specific problem.

2. **Seeking challenges as taking up work related problems**: Positive interpretation of stressors or work-related problems results in the perception of challenge (Van den Broeck, Vansteenkiste, de Witte, & Lens, 2008). Moreover, challenging job demands offer perspective and give the impression that they can be solved or overcome. The perception of challenge stimulates a problem focused coping style. When workers are confronted with challenges, they deal with the underlying problem. In our mechanisms, seeking challenge will be individual and collective behavior. When a work-related problem is noticed by an individual worker, this worker is expected to take responsibility to engage the problem. Given problem solving happens collectively, the challenge has to be taken up by (a part of) the group.

3. **Peer motivating (calibrating behavior)**: Based on the observation that different coaching styles exist, Vansteenkiste et al. (2019: 66-68) emphasize that the need (of teachers) to be capable of calibrating their motivation style to the characteristics of the learners and situation at hand is critical to stimulate autonomous motivation (cf. engagement). 'Calibration' involves different steps, skills and a "curious, open and process-focused attitude" (Vansteenkiste et al., 2019: 68). As calibration implies many different motivation styles which are dependent on the situation and the involved actors, we do not select one specific style to be integrated in the mechanism. This means that dependent on the team context and the specific problem we study, motivation style(s) used can and most likely will be different. Therefore, we will integrate calibration as a form of motivating behavior in the causal mechanism that is supportive of the actual problem-solving process.

Drawing on Self-Determination theory Aelterman et al. (2018: 112) distinguish two types of coaching styles that positively and two types that negatively impact autonomous motivation (cf. work engagement). Evidently, for the motivation mechanism we want to trace the focus lies on the motivation styles of 'autonomy support' and 'structure'. A large scale survey research in secondary schools targeting teachers (N = 1332) and their students (N = 1735) showed that motivating and demotivating teaching could best be graphically represented using a circular configuration with two dimensions of (basic psychological) need support and directiveness (Aelterman et al., 2018).[7] Each motivating style has two 'sub-styles'.

[7] Referring to the two dimensions in the circumplex model (Aelterman et al., 2018: 60) and the four motivation styles: 'Autonomy support' is need supportive and low in directiveness, 'Structure' is need supportive and high in directiveness, 'Control' is need thwarting and high in directiveness, 'Chaos' is need thwarting and low in directiveness.

Coaching style	Conceptual Definition	Subarea	Description
Autonomy support	The coach's instructional goal and interpersonal tone of ***understanding***: the coach seeks to maximally identify and nurture athletes' interests, opinions and feelings, so that they can voluntarily engage in activities.	Participative	A ***participative*** coach identifies athletes' personal interests by engaging in a dialogue with athletes and inviting them to provide input and suggestions. In addition, where possible, the coach tries to offer (meaningful) choices in how athletes deal with activities and optimally follows their pace.
		Attuning	An ***attuning*** coach nurtures athletes' personal interests by trying to find ways to make the exercises more interesting and enjoyable, accepting athletes' expressions of negative affect and trying to understand athletes' perspective. The coach provides explanatory rationales that are meaningful in the eyes of athletes.
Structure	The coach's instructional goal and interpersonal tone of ***guidance***: starting from the capabilities and abilities of athletes the coach provides help and assistance, so that athletes feel competent to master skills.	Guiding	A ***guiding*** coach nurtures athletes' progress by providing appropriate help and assistance as and when needed. The coach goes through the steps that are necessary to complete a task, so that athletes can continue independently and, if necessary, can ask questions.
		Clarifying	A ***clarifying*** coach communicates expectations to athletes in a clear and transparent way and the coach monitors athletes' progress in meeting the communicated expectations.
Control	The coach's instructional goal and interpersonal tone of ***pressure***: the coach forces athletes to think, feel, and behave in a prescribed way and imposes his/her own agenda and requirements to athletes, irrespective of what athletes think.	Demanding	A ***demanding*** coach requires discipline from the athletes by using powerful and commanding language. The coach points athletes to their obligations, tolerates no contradiction, and threatens with sanctions if athletes don't comply.
		Domineering	A ***domineering*** coach exerts power to athletes to make them comply with his/her requests. The coach suppresses athletes by inducing feelings of guilt, shame and anxiety.
Chaos	The coach's instructional goal and interpersonal tone of ***laissez faire***: the coach lets athletes on their own, making it confusing for athletes what they should do, how they should behave, and how they can develop their skills.	Abandoning	After repeated interventions, an ***abandoning*** coach gives up on athletes. The coach allows athletes to just do their own thing and no longer pokes athletes to put effort, because eventually athletes have to learn to take responsibility for their own behavior.
		Awaiting	An ***awaiting*** coach offers a laissez-faire climate where the initiative fully lies with the athletes. The coach tends to wait to see how things evolve, doesn't plan too much and rather let things take their course.

Figure 4: Description of the four coaching styles and eight motivational approaches based on Aelterman et al. (2018) in Delrue et al. (2019: 112)

Based on the observation that different styles exist, Vansteenkiste et al. (2019: 66-68) emphasize that the need (of teachers) to be capable of calibrating their motivation style to the characteristics of the learners and situation at hand is critical to stimulate autonomous motivation (cf. engagement).

The causal mechanism

The mechanism is triggered as a team member has detected a disturbance in the work flow and it becomes clear that the problem situation affects their work and the team task (cf. identified it as a problem that surpasses his or her individual job). People feel the need to act because the team task has considerable personal significance and is under threat of the pending problem situation. This sense of dedication will urge or trigger people to act themselves / take initiative without the need be commanded.

The next part relates to the control cycle in Modern Sociotechnical theory. First an individual worker considers her/his personal control opportunities (cf. internal control = range of possible actions). When the personal control opportunities are deemed as insufficient to solve the problem, the worker involves other workers (and their control opportunities) to deal with the problem. Team resources can be social support: time, awareness, involvement of other team members, leader attention and/or approval.

After that, the team member(s) that initially detected the problem will explain the problem situation. Team resources are budget, time (FTE), infrastructure and/or knowhow (e.g. manager, extra-team member). The convincing can be done by other team members than the one that initially detected the problem. Other team members can bring other information to the table that can further strengthen the case to take action for other team members. This is related to the mechanism of perspective

taking. Appealing to other's work dedication is done by making clear how the situation affects the team task (as a shared identity), action is needed and that the problem can be overcome. Importantly, other team members are not 'forced' to cooperate. However, the initial contacting of others (in the first part) could be an act of power (e.g. oblige others to listen or have a meeting).

In the next part, the team is committed to solve the problem: the problem remains on the agenda or a priority until an adequate solution is found. The initiative does not stall or is permanently deprioritized. During that time adequate resources (cf. budget, time, infrastructure and/or knowhow) are assigned to the problem solving process. This can involve multiple iterations of testing and (consequent) adapting of solutions.

Finally, The team members will come up with a work solution and commit to it. Commitment means that team members believe the solution is relevant and adequate from their perspective.[8]

[8] The full text of this theory can be found in Annex 5.

Table 10: Mechanism Motivation

Cause	Part 1	Part 2	Part 3	Part 4	Outcome
Team member(s) detect(s) a work-related problem	The **team member** **feels addressed to take action** by emphasizing the importance of effective performance of the team task.	The **team member** **assesses** her/his range of possible actions*, **realizes** that the problem can only be adequately solved at the team level and **takes initiative to contact** other team members to explain the problem situation in order to mobilize 'team resources' to deal with the problem situation. *(considers his control opportunities)	**Team members** **discuss** the problem situation using an appropriate style of interaction so that **they** **feel addressed to take action** and **express their willingness** to personally contribute to solving the problems or assign team resources.	**Team members** **engage** in problem solving using an appropriate style of interaction so that **they** **make a focused effort** and **invest team resources** until a solution is found that is deemed adequate to deal with the problem situation.	**Team members** come up with a work solution to the problem situation and commit to it.
Relevant concepts *The causal story*	**Dedication** **Challenge seeking**	**Energy** **Challenge seeking** **Resource seeking** **Heedful interrelating**	**(Collective) dedication** **(Collective) challenge seeking**	**Collective focus** **Collective absorption/energy**	**Collective commitment** **Heedful interrelating**
Observable manifestations (see annex)					
Conditions					
MO* = Mindful organizing	MO * - Reluctance to simplify	MO* - Deference to expertise MO* - Commitment to resilience Autonomy supportive context Availability of team resources	MO* - Sensitivity to operations MO* - Reluctance to simplify Autonomy supportive context Availability of team resources	MO* - Sensitivity to operations MO* - Commitment to resilience Autonomy supportive context Availability of team resources	

5. From project to case selection

The following section guides through the stepwise selection procedure that we used in order to identify suitable organizations for this research who have implemented a new organizational structure via an ESF-project "Anders Organiseren". Within these organizations, we selected teams. Employees from those teams were interviewed in order to identify cases for process-tracing (work-related problems, see also 3.3 Data collection).

5.1. Selecting organizations according to a Modern Socio-Technical Organization context

In order to select suitable "Anders Organiseren" projects, we used the total population of ESF subsidized projects (calls 310, 318, 343, 376, 387 and 397). The decision to select from all ESF-projects, and not only from calls 387 and 397, was twofold. Firstly, this study requires organizations to have made considerable progress in their projects and to already have implemented the new organization structure. Secondly, based on earlier explorative interviews with cases from call 397, there are strong indications that not all projects will have implemented socio-technical structure changes.

The first step in the exploration was to select organizations that show socio-technical (structural) parameters**.** As outlined before in this report, the key argument for this first selection is that the aim of ESF-call is to subsidize socio-technical structural interventions, therefore conformity of organizations to sociotechnical parameters is key. Three socio-technical parameters were used to identify eligible cases: functional de-concentration, functional de-specialization and division of operational activies (see also section 4.1).

In order to be able to score organizations/projects on these parameters, we carried out two separate data collection strategies (see Figure 5 for an overview and Annex 8 for the methodology):

(1) Data collection through an **e-mail survey** sent out to all ESF-projects, with the main goal to gather documents from organizations to asses socio-technical parameters, and a secondary goal to obtain some information on project quality (presence of preparatory analyses) and on project progress (which phase of structural change organizations are currently in). Where necessary, the analysis of the documents was complemented by phone interviews with contacts of the ESF project or with (mainly Workitects) consultants who guided the projects. An e-mail survey was the chosen method, because of efficiency. This would also be a first 'filter' for the selection (e.g. How are these organizations doing? Are they responsive?).

(2) Data collection with ESF-projects that were **indicated by Workitects as 'good cases'** of socio-technical structure change. Phone interviews were conducted with (mainly Workitects) consultants who guided these projects in their transformation towards a socio-technical organization. The interviewers used socio-technical parameters to collect data and score organizations/projects, together with the consultants.

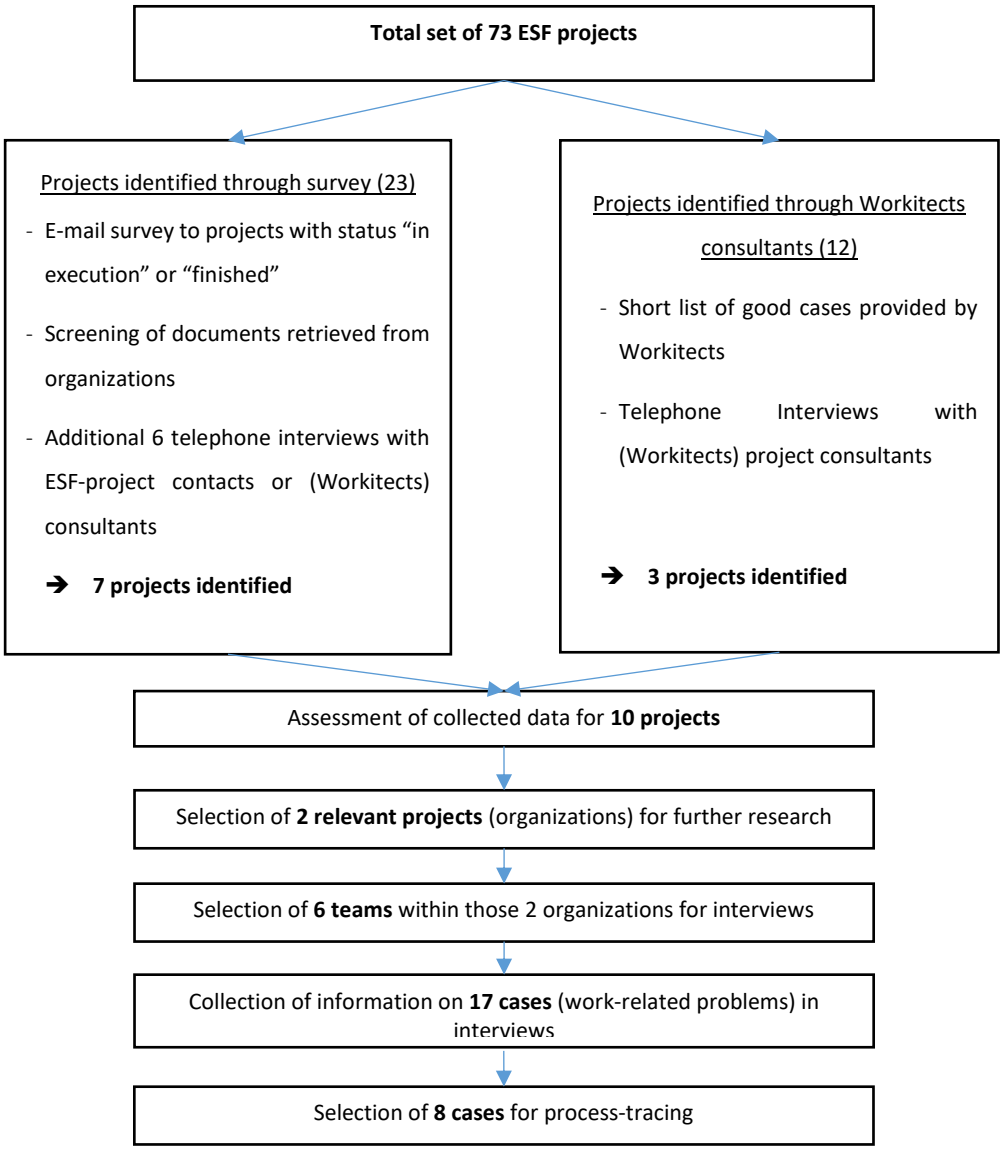


Figure 5: Overview of the selection process
Source: Own elaboration

Projects identified through survey

The research team received completed surveys from 23 out of 73 organizations in different project calls. Out of the 23 responses, 11 organizations indicated that they hadcompleted the implementation of the new organizational structure. It is essential for us to only select organizations for further research that have implemented the new organizational structure, because only then can we assess the impact of this new structure. First, almost all projects that answered the survey (22 out of 23) drew the organizational chart before the start of the project. Remarkably, only 15 out of 23 projects did a process analysis as a preparation for the project. This is remarkable, as ESF regulations stipulate that a process analysis is obligatory. Furthermore, 14 organizations identified weak spots open for improvement. Fourteen organizations set up an organizational chart of their desired organizational structure, while 3 indicated that this is in progress. Lastly, 14 projects set up an implementation plan, while 6 projects are still working on their plan.

By combining this information, we identified **7 organizations** from the survey that:

1. indicated willingness to participate in the next stage of the research in the survey;
2. have completed the implementation of the new organizational structure.

For these 7 organizations, information on the retrieved documents and additional information from 6 phone interviews were analyzed to assess the organizations' conformity to sociotechnical parameters (4 with consultants, and 2 with organizational representatives). We used this information to assess three sociotechnical structural parameters for each organization. As outlined before, the three structural parameters are based on sociotechnical theory (de Sitter, 1998; Kuipers et al., 2010; Van Laar et al, 2015) and were selected in consultation with both experts on Modern Sociotechnical theory in the team. These three parameters can be considered as "minimal features" that an organization structure has to show to be considered in the set of sociotechnical context. They are also included in this research as important contextual conditions.

Projects identified through Workitects consultants

Based on the criteria mentioned above, Workitects indicated 12 ESF-projects that are relevant for us to look into in more detail. Four of these organizations also filled in our e-mail survey. Seven organizations were excluded: one organization was already participating in another research project and was excluded due to the risk over-questioning; four organizations were impossible to contact and thus an interview was impossible to conduct; and two other organizations were not willing to participate in the next stages of the research, as indicated by Workitects consultants. This leaves us with **3 projects identified** by Workitects that met our criteria and could be analyzed based on the structural parameters.

Socio-technical parameters

Based on the two data collection strategies, we collected **a total number of 10 organizations** that met our criteria to further analyze them based on the structural, socio-technical parameters (see Table presented before).

The detailed results of this analysis are included in Annex 6. Table 11 displays a summary of the scores (cf. negative or positive) on the structural parameters per project. As noted earlier, the scores for the sub-parameters "functional de-concentration (cross-functionality) - common output" and "functional de-concentration (cross-functionality) - different functions" both have to be positive to get a positive score on the main criterium "functional de-concentration".

Table 11: Structural parameter scores per project

ID	functional de-concentration	functional de-specialization	division of operational activities (functional integration)
1	0	0	0
2	1	1	1
3	0	/	0
5	0	0	0
6	0	1	1
8	1	1	1
11	0	1	1
12	1	1	1

13	1	/	1
16	1	1	1

Source: Own elaboration

We chose to include all organizations that scored positively on at least one socio-technical parameter, in order to have a big enough set of organizations for the next stage of the research. Looking at STDT however, all three parameters are equally important. This is a pragmatic approach to select cases in order to gather a convenience sample. We contacted the respective organizations, with the request to participate in our study, ending up with 2 organizations who wanted to participate in the subsequent intensive data collection phases.

In these 2 organizations, first exploratory interviews were conducted with 6 teams and their respective team leaders in order to identify possible interesting cases (cf. work-related problems) for process tracing. See next section for the rationale behind case selection.

5.2. Selecting cases for empirical research

In total, 17 work-related problems were identified during the interviews with the six teams from the two selected organizations. Both organizations are active in the health care sector: home care (Organization 1) and residential care centers (Organization 2). They have been selected after visiting the organizations, because of their progress with organizing differently and their willingness to cooperate. The advantage of studying two organizations in the same sector, is that comparisons can be made more easily. The teams have been selected together with the organization, based on willingness to cooperate, availability, location (e.g. two teams in the same building):

- Organization 1: 3 locations, 3 teams;
- Organization 2: 2 locations, 3 teams (two teams in the same building).

As stated before, during the interviews, 17 work-related problems were discussed. Of these 17, 8 cases were selected to study in detail. This selection was based on:

- whether cases are independent: there's no learning effect from previous events;
- the involvement of the whole team or at least multiple team members;
- the learning potential for the organization;
- in what way are mechanisms studied in the case: fully (the whole process) or key parts?;
- whether it's a tactical or an operational case: is it related to the strategy of the team or is it a purely operational issue?;
- whether it's a deviant or a typical case in terms of outcome: are there currently work arrangements concerning the problem (=typical) or not (=deviant)?.

Also, some practicalities were taken into account: the amount of details the interviewees remembered, whether the organizations were easy to contact to find out extra information if necessary, the richness of the evidence (e.g. trace evidence, for example a meeting report, e-mail conversations…). See table 12 below for a schematic overview of this selection.

Table 12: Overview of all cases (17) and selection categories

	Case	independent cases	learning potential organization	mechanisms	willingness to cooperate	tactical or operational?	deviant or typical case? (Are there currently work arrangements concerning the problem or not?)	evidence
3	interns	x	x	4/4	x	tactical	typical	ok
1	permanent absence	x	x	4/4	x	operational	typical	ok
	planning	x	x	2-3/4 (Pat.rec.?)	(x)	operational	pending	harder
	swallowing	x	x	3/4 (Pat.rec.?)		operational	pending	harder
6	mobile hoist	x	x	3/4 (Pat.rec.?)		operational	typical	harder
	immodium	x	x	2/4 (pat.rec and PT?)		operational	deviant	harder
	wound care	Possibly dependent with the Incontinence case, need further info about timing of both cases.	x	3/4 (pat.rec?)	x	operational	pending	ok
7	incontinence	Possibly dependent with the wound care case, need further info about timing of both cases.	x	3-4/4 (pat.rec?)	x	operational	typical	ok
8	contingency plan	x	x	3-4/4 (pat.rec?)	x	tactical	pending	ok
	psychiatric patients - extension table	x	x	3/4 (pat.rec?)	x	operational	pending	harder
	Making short term planning through WhatsApp.	(dependent on case about making own planning - team members use the WA to make their own work planning)	x	3-4/4 (pat.rec?)	x	tactical	typical	ok
2	basic care team workers start making their own planning	x	x	3-4/4 (pat.rec?)	x	tactical	typical	ok
4	Team workers made arrangements for weekend work	x	x	2/4 (pat. rec? CD?)	x	tactical	typical	ok
	Team meeting: 2 min round	x	x	3-4/4 (pat. rec)	x	tactical	Deviant (Respondents thingk that current work arrangements are not working well yet)	ok
	Planning: availability	x	x	3-4/4 (pat. rec?)	x	tactical	Deviant (solution was presented and offered but team members don't use it nor like it)	ok
5	Planning outside working hours	x	x	3-4/4 (pat. rec?)	x	tactical	Deviant (solution was presented and offered but team members don't use it nor like it)	harder
	Booklets	x	x	3/4 (PT => what is the outcome in this case?)	x	operational now could become tactical	pending	harder

Source: own elaboration

6. Empirical results

6.1. Overview of the selected cases

Tabel 13: Overview of cases

	Case	Mechanisms to study	Tactical or operational? Typical or deviant?	Short description
1	Permanent absence	Fully	Tactical: the question is how the team should solve the absence in the long term, this has an impact on the work organization and the whole team is involved. *Typical*	The question is how the team should solve the absence in the long term, this has an impact on the work organization and the whole team is involved.
2	Planning	Fully	Tactical: the planning is an important task, because the whole organization and every team member depends on it. The responsibility of this task is questioned: the team is making the planning autonomously instead of the team leader. *Typical*	The planning is an important task, because the whole organization and every team member depends on it. The responsibility of this task is questioned: the team is making the planning autonomously instead of the team leader.
3	Interns	Key parts	Tactical: there's chaos about the responsibilities concerning intern introductions, but this is an important issue since work pressure is high, so team members do not feel like they're able to take on this extra task. *Typical*	There's chaos about the responsibilities concerning intern introductions, but this is an important issue since work pressure is high, so team members do not feel like they're able to take on this extra task.
4	Weekend work arrangements	Key parts	Operational: There are some frustrations about working during the weekend, so the duration of a client visit during the weekend is reduced, which is an operational decision. *Typical*	There are some frustrations about working during the weekend, so the duration of a client visit during the weekend is reduced, which is an operational decision.
5	Planning outside working hours	Key parts	Tactical: There's a policy of the team not to use private time to make the planning, but this happens a lot. Team members are not happy and wish there would be a solution for this. *Deviant*	There's a policy of the team not to use private time to make the planning, but this happens a lot. Team members are not happy and wish there would be a solution for this.
6	Mobile hoist	Key parts	Operational: Some work agreements that have been agreed upon are not followed by some team members, other team members see this and signal it. *Typical*	Some work agreements that have been agreed upon are not followed by some team members, other team members see this and signal it.
7	Incontinence	Key parts	Tactical: A communication problem between team members makes the team change the way they coordinate and communicate. *Typical*	A communication problem between team members makes the team change the way they coordinate and communicate.
8	Contingency plan	Key parts	Tactical: The team tries to figure out what to do when there's no full occupation, in order to avoid chaos and stress. *Typical*	The team tries to figure out what to do when there's no full occupation, in order to avoid chaos and stress.

Source: own elaboration

6.2. Full analysis versus key part analysis

As can be seen from the table above, the first two cases “Permanent absence” and “Planning” are studied fully, which means for all four theoretical mechanisms the whole process is studied. For the other six cases we conducted a key part analysis: one part per mechanism is studied in every case for every mechanism. This key part has been selected per mechanism as the most crucial part in the specific process. Without these parts, the mechanism would not be present in the cases. This is a vital step in the mechanism sequence. This choice has been made in order to make the analysis manageable, within the scope of this study. For the key part analysis, the following parts have been selected and studied in the 6 cases:

- Pattern recognition: key part **gathering information** – Theorized part 1: Team members memorize or record a broad range of “chunks of experience” concerning (past) events, context variables… in a sufficiently fine-grained way, including their own early interpretations and possible biases.
- Cognitive dissonance: key part **searching social support** – Theorized part 3: Due to this increase of dissonance, individual team members search for social support - by communicating the perceived signs of trouble to other peers - in order to know what to do.
- Perspective taking: key part **collective solutions** – Theorized part 5: Team members propose and discuss collective solutions (using pending the individual understandings of the problem situation and solution within the team) and reach agreement based on convergent individual perceptions of the solution at least being relevant and adequate in solving the problem situation.
- Motivation: key part **feeling addressed to take action** – Theorized part 1: The team member feels addressed to take action by emphasizing the importance of effective performance of the team task.

In the next sections, the cases are analyzed one at a time. After each analysis in words, the mechanistic sketches can be found that elaborate the analyses per part of the mechanism. In section 6.11 a cross-case overview is given.

6.3. Case I: Permanent absence

6.3.1. Introduction

Organization 1 is divided into 18 regions in Flanders, of which T. is one. T. consists of the whole region Noorderkempen. There are 600 employees: mainly caretakers, cleaning personnel, sitters… There is a living assistance project and there’s a day center for elderly people.

In T. 30 employees who help guide the whole operation are based there. The subregional team (SRT) in T. consists of 11 people (care partners). Most of them are in charge of four teams of care workers. There are also employees who don’t have care teams, they have a support function (e.g. someone who takes care of the service phone).

The team has a colleague (X) who takes care of the service phone. Organization 1 needs to be accessible by phone between 7-17h. This colleague was sick (for a short period of time) around September 2019. Since then, that colleague had been absent a few times, each for a short period of time. In November 2019 the message came that she was going to be absent for a long time, which didn’t come as a shock to the team. This meant the team had to make a long-term planning to take over the shifts of their colleague.

6.3.2. Narrative

The absence of colleague X resulted in a disturbance that altered the normal workflow routine. This was an important issue, because colleague X was in charge of the service phone. This is a vital task within Organization 1, because phone accessibility during the day is necessary for a good work organization. The team leader makes it clear this task must be executed at all times, this means replacing the absent colleague who takes care of the service phone, and that team members should make work agreements between them to organize this.

Every last-minute change in the planning, information about clients or care workers is communicated through the service phone. Replacing colleague X is not something that can be done by one team member, because this is too much work. Team members identify this as a task they do not want to go wrong, they are aware of the importance of the task. The team members already had a feeling their colleague would not be coming back anytime soon. Although they still looked for acute solutions, they felt that their colleague could be absent for a longer period of time.

At this point, the team explains how they try to look for a solution themselves. From the interviews, we cannot confirm that team members figured out the signs of the deviation in the workflow. When they started matching past experiences with the current problem situation, the team members learned that half day shifts for the service phone are not effective. They see the similarities between these experiences and the situation with their colleague X. The team concluded that dealing with half day shifts causes information loss and frustration. Often the operational issues addressed via the phone service extend over multiple days (e.g. absence of base care worker that needs rescheduling) and requires some continuity. When every half day another care partner takes over phone service duty, information needs to get exchanged but inevitably some information did get lost and caused frustrations within the team. This leaves the team members with an unpleasant feeling, perceiving signs this absence is going to be for a longer period of time and the same issues from the past might emerge in this situation.

6.3.3. Pattern recognition

Cause
Team members systematically and intentionally engage in inquiry with relevant information sources, concerning what is going on in a critical domain, with the intent to uncover signs of potentially systemic failure early on.

This part is not really present. The team does engage in inquiry with relevant information sources, but this is limited to “team meetings” and encounters in the hallway or conversations between colleagues. There’s no systematic inquiry about critical domains.

Part 1 & 2
Team members memorize or record a broad range of “chunks of experience” concerning (past) events, context variables… in a sufficiently fine-grained way, including their own early interpretations as reflecting their possible biases.

It seems logical that when inquiry (the trigger of this mechanism) is not fully present, the team members won’t be able to record a broad range of information about past events. Some information is retained, but it’s not recorded: the team members don’t do anything with it. Afterwards, they state they were not surprised their colleague was not doing well, but they didn’t act on it.

Outcome
With the addition of a piece of information, a hunch suddenly emerges (from the team members' sub-conscious) that this new information, in the context of the retained information, is indicating an emerging systemic failure.

The team wasn't able to notice nor prevent an emerging systemic failure (their colleague became absent permanently).

6.3.4. Cognitive dissonance

The initial reaction to the absence of X was panic (see C1): the team members saw this as a lot of extra work, while work pressure was already high for the team. The reason the team reacted like this was mainly that the long-term absence came unexpected. Since it's an operational issue (related to the planning), the team leader encourages the team to look for solutions themselves (see P1). The team leader supports the team when they have questions, but let's them talk freely about the problem.

This issue is recognizable for every team member: they know that when someone is absent, their shifts need to be taken over. They don't question whether it's necessary to take over the shifts, since the service phone is the way in which operational changes in schedule and issues are addressed with clients and care workers (see P2).

The team communicates with each other about how to handle this issue (see P3). The interviewees emphasize the fact that everyone is needed to see what possibilities they have to take over shifts. More precisely, acute solutions consisted of planning half days for the coming two weeks with team members who are present at the office (see P4). The interviewees (3 team members) emphasized that there is a great sense of responsibility in the team and that they show solidarity to each do their part. This is important to be able to create common awareness about the problem: every team member cares (see P5).

Together with the increased workload this emphasized the necessity to discuss the problem with the whole group. These acute solutions caused one of the team members to utter frustrations about this and points out that it's always the same team members who take over the phone service from X (see P6). This shows the temporary solution is not feasible in the long term, which is why the team asks their team leader if they can get a replacement for their absent colleague (see P7). The team takes advantage of the unique (communication) skills of one of the team members to communicate their issue to their team leader. Their team leader gives the team the signal that they have to solve the issue themselves. An extra person did join the team, but this was already planned before the absence of their colleague, moreover they had to share this person with another team. So, this wasn't a long-term solution for their problem (see P8 and P9).

This is where the team tried to find a more structural solution: plan full days of phone service over longer periods of time. Their mindset focused more on finding a global, structural solution for the absence (see P10). They divided the days based on the amount of work someone has. The team members are aware of the shaky acute solutions, they look for a global solution. This permanent solution, where each day was taken over by a fixed team member, didn't stand very long, because of new events (e.g. pregnancy leave of one colleague, new colleague resigns). So, this solution has to be revised from time to time. The problem is not solved, but it is on the agenda and the team keeps looking at it to find proper solutions that they can hold on to for at least a few weeks (see outcome).

6.3.5. Perspective Taking

It was clear for team members (present at the office) that the issue of the service phone planning exceeded their individual capacity to deal with it properly and a collective solution was needed (see P1). In order to find a structural solution to take over the shifts of their absent colleague, the issue is discussed within the team. The team member who is responsible for the team agenda makes a topic of this to discuss on a formal meeting later on (see P2). Even before the formal meetings take place, the team members talk about the issue with each other and what to do about it. The interviews didn't provide us with much details about these conversations. The interviewees emphasize that it's important to address the different viewpoints in the team, so that everyone has the feeling they are on the same page. The decisions made in the meetings should be collective (see P3). Because of the way they work, the team has experience with taking over shifts for other colleagues. They do recognize that the acute way of dealing with this (e.g. ad hoc half day planning) causes frustration (see P4).

In the team meetings that are held, the acute solutions (half days) make way for a structural solution where colleagues take on full days of the service phone. This made it easier to combine service phone duty with other work activities, avoiding the necessity to reschedule appointments etc. The team discusses alternatives as to how to go about normal work activities. The interviewees emphasize the involvement of all team members in this process. Team members know what needs to happen: everyone who is able to (who has some extra time or a less busy workday) should offer to take over one or more shifts. E.g. B does not have a care worker team to attend to (she does not have the same hectic Thursdays as the other care partners), so she is more flexible and proposed to take up a couple of days so that the extra workload for others remained limited. This is all done in those various team meetings (see P5):

- Date missing: Mondays and Thursdays taken up by A, Wednesdays and Fridays by B, Tuesdays by other team members.
- 14/10/2019: Colleague is reassigned to another team so that Mondays have to be taken up by team members depending on their agenda and Thursdays are taken up by E.
- 04/11/2020 & 19/11/2019: Planning of half days of the service phone duty on Mondays
- 14/01/2020: New planning

Eventually, each meeting results in a solution that works only temporarily, because of changes within the team (e.g. colleague on pregnancy leave, colleague resigns). This is why there are various solutions, each relevant for a certain period of time. The solutions seemed to be clear for every team member and carried out that way (see outcome).

6.3.6. Motivation

From the beginning, the moment when it became clear colleague X was going to be absent permanently, the team knew it would take every team member to help come up with a solution. Simply because the service phone is an important task and it's too much work for one team member to take over (see observations P1). Therefore, a team meeting is organized to discuss the problem (see observations P2).

Interviewees state that in the meetings every individual team member contributes to the team solution by communicating about free time and possibility to take on extra shifts (see observations P3). They talk about finding a solution as a team, a collective solution that everyone can be happy with. People in the organization respect one another and they do not take for granted the extra work the team members have to do in order to take over the shifts. Even across the teams, there is solidarity and support: an informal conversation in the hallway lead to a colleague from another team to help

out for a few weeks. The meetings show that the team puts effort into finding an adequate solution, using every individual team member's input (see P4). The interviewees state that they were happy with the found solution, but that it's always a temporary fix, because of rapid changes within the team (e.g. pregnancy, resignation, sickness…) (see outcome).

6.3.7. Conclusion case 1

As could be read in the narrative, this problem has exploded (there was panic regarding the issue), so the intuitive pattern recognition did not succeed in this case.

Most of the parts of the other mechanisms are present (see road maps). We can clearly observe an ongoing process of organizing, because team members have dealt with changes in the work environment modifying the way in which work is organized (de Sitter, 1994). Those changes have included some tactical control, when team members have dealt with issues related to the team tasks in a process that consisted of perceiving a cue (noticing) and bracketing it, reducing the dissonance produced by the existence of the cue by putting it on the agenda, sharing perspectives for its resolutions and making common effort for its final resolution. The problem here is that the perspective taking is taking place when an issue has already exploded, which doesn't make it a very successful case.

The team has handled the problem of a colleague who becomes permanently absent idependently, partly because it is expected of them by their team leader, but also because the team has experience with changing the planning and taking over shifts from colleagues (reorganizing is part of the job). Because of this experience, the team clearly identifies a few issues with taking over shifts: information loss and frustration within the team (noticing). They recognized a pattern when the problem already exploded: these issues occur when the service phone is taken over for half a day, because one colleague has to transfer information to the next colleague (pattern recognition). The team incorporates this in their strategy to solve the problem, by trying to take over full days instead of half days (organizing). This case shows team members could be better prepared in their collective ability to notice unexpected events and correct errors (preoccupation with failure). However, everyone is preoccupied with the failure of production workflow and tries to help out where possible (perspective taking). The planning of shifts remains a tricky task, because there are constant changes in the composition of the team, because of temporary or long-term absences. However, everybody in the team feels addressed as they feel responsible for the team task (motivation).

Tabel 14: Mechanistic sketch case 1: Intuitive pattern recognition

Cause	Part 1	Part 2	Outcome
Start of inquiry	Gathering information	Mentally browsing information	Integration (bracketing information leads to new insights)
Team members systematically and intentionally engage in inquiry with relevant information sources, concerning what is going on in a critical domain, with the intent to uncover signs of potentially systemic failure early on.	Team members memorize or record a broad range of "chunks of experience" concerning (past) events, context variables… in a sufficiently fine-grained way, including their own early interpretations as reflecting their possible biases. 	Inquiring team members mentally browse (some of) the retained information in a variety of ways, while continuing to add new information from ongoing probing, from others within or outside the team.	With the addition of a piece of information, a hunch suddenly emerges (from the team members' sub-conscious) that this new information, in the context of the retained information, is indicating an emerging systemic failure.
Analysis			
This part is not really present. The team does engage in inquiry with relevant information sources, but this is limited to "team meetings" and encounters in the hallway or conversations between colleagues. There's no systematic inquiry about critical domains.	It seems logical that when inquiry (the trigger of this mechanism) is not fully present, the team members won't be able to record a broad range of information about past events. Some information is retained, but it's not recorded: the team members don't do anything with it. Afterwards, they state they were not surprised their colleague was not doing well, but they didn't act on it.		The team wasn't able to notice nor prevent an emerging systemic failure (their colleague became absent permanently).

Table 15: Mechanistic sketch case 1: Cognitive dissonance

Cognitive dissonance reduction causal mechanism - Ideal type							
(1) Pathway: Search for information and talking to the team (linear sequence)							
Theory							
Cause – Motivational force as a sense of urgency	**Pathway**	**Voluntary exposure to information**		**Pathway in linear sequence**	**Building social support**		**Common awareness intention**
		Part 1	**Part 2**		**Part 3**	**Part 4**	**Part 5**
Due to the dissonance caused by 'unexpected events' [violation of expectations] at work, individual team member feels pressure to reduce it because he/she is aware that unresolved dissonance could interfere with (1) his/her effective job performance' and group performance, and (2) because it is psychologically unpleasant.	***Search for information***	Individual team member **seeks out** information about the sources of this 'cognitive discrepancy' (the salient cues not prevented by the current mental models) - by collecting material with the expectation to achieve consonant cognition with the existing cognitive elements.	Individual team member **identifies** some dissonant-increasing new information: 'actual signs of trouble deserve closer attention'.	***Dissonance is not reduced, so next pathway talking to team members to reduce cognitive dissonance***	Due to this increase of dissonance, individual **team members search** for social support - by **communicating** the perceived signs of trouble to other **peers** - in order to know what to do.	**Team members listen** to one another about their concern and **agreed** that, even if, a long-term solution is imperative for this cue, some urgent measures need to be implemented, because the cue has escalated.	Due to this escalation, some kind of common awareness is established within the team about the possible slippage of the cues if they are not managed on time and the negative consequences for the team performance. Thus, using this argument, team members craft some kind of solution they can provide individually from their autonomy [e.g. re-planning].
Case 1: Permanent absence							
The initial reaction to the absence of X was panic (see C1): the team members saw this as a lot of extra work, while work pressure was already high for the team. The reason the team reacted like this was mainly that the long-term absence came unexpected.		*When the team tries to find out what to do, the team leader encourages the team to look for solutions themselves, since it's an operational issue (related to the planning).*	*This issue is recognizable for every team member. They don't question whether it's necessary to take over the shifts, since the service phone is the way in which operational changes in schedule and issues are addressed with clients and care workers.*		*The team needs every team member to be involved in the solution, because it's about replacing someone, so it's not possible to solve this without communicating/discussing.*	*The reason to put it on the agenda is that they got the message X was going to be absent for a longer period, so the problem becomes more severe.*	*When talking about this issue, team member states that everyone contributes to the solution and no one ignores the need for such a solution, so there is a common awareness. Another team member also confirms this.*

Uniform reaction	**Pathway in linear sequence**	**Uniform reaction**	**Elephant in the room**		**Reducing discrepancy**	**Outcome - dissonance is reduced**
Part 6		**Part 7**	**Part 8**	**Part 9**	**Part 10**	
As they are searching for solutions, **team members debate** that such solutions are not sustainable for long-term period producing a uniform within-team reaction that some actions need to be taken and approved by the team leader because of his expertise and experience.	***Dissonance is not reduced, so next pathway talking to team leader to reduce cognitive dissonance***	**Team members decide to communicate** their concerns to team leader with arguments about their preoccupation with failure, in order to search for a final solution to the escalated problem.	Team leader **listens** and **notices** that the issue is important for the whole group and deserves attention. (team leader cannot pretend that nothing's wrong and the rest of his/her team knows there is - it can be really problematic).	**Team leader confirms** the importance of the problem and **manages** the discussion by proposing some kind of problem-solving setting with the whole team as a way to increase the likelihood of recovery and continuing reliable performance.	Team members **agreed** with the existing proposal because they feel listened to/taken seriously as the issue is put on the agenda by the team leader for its resolution. The cognitive discrepancy is reduced, although not yet eliminated.	Total dissonance is reduced, internal balance/harmony is restored because the 'perceived issue' is in the agenda for solution
Case 1: Permanent absence						
There were concerns in the team about the problem with the permanent absence of colleague X. It is clearly about a long-term planning change, because they explain to the team member who showed concerns they did not want to plan further ahead than 1-2 weeks. The concerns were about the fact that the same people always had to replace the absent colleague.		*This shows the temporary solution is not feasible in the long term, which is why the team asks their team leader if they can get a replacement for their absent colleague.*	*The team leader states that he/she talked to the team member who came to him/her (to discuss the solutions) so that they can bring this to their team meeting. This implies he/she listened.*	*An extra person did join the team, but this was already planned before the absence of their colleague, moreover they had to share this person with another team. So, this wasn't a long-term solution for their problem*	*This is where the team tried to find a more structural solution: plan full days of phone service over longer periods of time. Their mindset focused more on finding a global, structural solution for the absence.*	*This permanent solution, where each day was taken over by a fixed team member, had to be revised because of new events (e.g. pregnancy leave of one colleague, new colleague resigns). The problem is not solved, but it is on the agenda and the team keeps looking at it to find proper solutions that they can hold on to for at least a few weeks*

Table 16: Mechanistic sketch case 1: Perspective taking

Theory						
Cause	**Part 1**	**Part 2**	**Part 3**	**Part 4**	**Part 5**	**Outcome**
Team member detects a disturbance during the operation of her/his work activities.	The **team member** **tries to find** an adequate explanation (cf. to make sense) for the observed disturbances in terms of the team work organization (drawing on her/his existing knowledge about the work organization) that enables her/him to design an adequate solution but **is unable** to do so.	The **team member** **contacts other team members** to explain and discuss the problem situation in order to find an explanation that enables an adequate solution.	**Team members** **share** their experiences (cf. exemplars) with problems, their pending explanation of the problem situation in terms of the work organization and **facilitate** mutual understanding.	**Team members** **discuss each other's** experiences and explanations by **identifying** similarities and differences (incl. contradictions) between explanations in terms of the problem and solution.	**Team members** **propose and discuss collective solutions** (using pending the individual understandings of the problem situation and solution within the team) **and reach agreement** based on convergent individual perceptions of the solution at least being relevant and adequate* in solving the problem situation. *The solution is consistent with how a team member understands the problem situation.	Team members hold a shared perspective on what needs to be done.
Case 1: Permanent absence						
The absence of colleague X resulted in a disturbance.	*It was clear for team members (present at the office) that the issue of the service phone planning exceeded their individual capacity to deal with it properly and a collective solution was needed.*	*The team member who is responsible for the team agenda makes this a topic to discuss at a formal meeting later on.*	*The interviewees emphasize that it's important to address the different viewpoints in the team, so that everyone has the feeling they are on the same page. The decisions made at the meetings should be collective.*	*Because of the way they work, the team has experience with taking over shifts for other colleagues. They do recognize that the acute way of dealing with this (e.g. ad hoc half day planning) causes frustration.*	*Various meetings are held in order to find a solution for the absence of their colleague.*	*Eventually, each meeting results in a solution that works only temporarily, because of changes within the team (e.g. colleague on pregnancy leave, colleague resigns). This is why there are various solutions, each relevant for a certain period of time.*

Table 17: Mechanistic sketch case 1: Motivation

Theory					
Cause	**Part 1**	**Part 2**	**Part 3**	**Part 4**	**Outcome**
Team member(s) detect(s) a work-related problem	The **team member** **feels addressed to take action** by emphasizing the importance of effective performance of the team task.	The **team member** **assesses** her/his range of possible actions*, **realizes** that the problem can only be adequately solved at team level and **takes initiative to contact** other team members to explain the problem situation in order to mobilize 'team resources' to deal with the problem situation. *(considers his control opportunities)	**Team members** **discuss** the problem situation using an appropriate style of interaction so that **they** **feel addressed to take action** and **express their willingness** to personally contribute to solving the problems or assign team resources.	**Team members** **engage** in problem solving using an appropriate style of interaction so that **they** **make a focused effort** and **invest team resources** until a solution is found that is deemed adequate to deal with the problem situation.	**Team members** come up with a work solution to the problem situation and commit to it.
Case 1: Permanent absence					
The absence of colleague X became permanent.	*The service phone is an important task and it's too much work for one team member to take over, which is why the team felt addressed to take action.*	*Team members' action to contact other team members was self-initiated because of the realization that other team members needed to be involved.*	*In the meetings every individual team member contributes to the team solution by communicating about free time and possibility to take on extra shifts.*	*A series of meetings took place, focused on problem solving resulting in different work solutions. The details of the interactions could not be derived from the interviews.*	*Interviewees report (in general) that there never is any resistance to having to fall in for the service phone duty. Team members can state openly if they have time or not to take extra hours of service phone duty, there has always been solidarity. In the end everybody wants clients to receive their services and that service provision is managed well.*

6.4. Case II: Planning

6.4.1. Introduction

Organization 1 is divided into 18 regions in Flanders, of which L. is one. The team we interviewed in L. consists of 10 care workers and 4-5 cleaning staff. Since September 2019 this team is mixed: care workers and cleaning staff are part of the same team. The team has a bi-weekly team meeting with all care workers and their team leader to discuss clients, specific situations and other work-related issues. Once a month, cleaning staff also attend this meeting. The team leader chairs the meetings (in charge of time and agenda management). Every week the planning is made by three team members, planning for the cleaning staff is made on a monthly basis.

Before, the planning was made collectively for a period of two weeks. The problem with this was that the planning had to be adapted constantly. This all happened via the service phone: team members and clients are not allowed to contact one another directly. Because of this, mistakes happened and there was information loss (e.g. client has to go to the hospital, so no care at home needed, but this wasn't correctly communicated). The team leader gave the responsibility of making the planning to the team members. The team now makes their own planning for about one year, thus before the mixed team (cf. care workers and cleaning staff together) was created.

6.4.2. Narrative

The team uses a two-week planning system. This system resulted in a disturbance that altered the normal workflow routine: there were a lot of reactions from team members saying that during the first week the planning changes a lot, and even more during the second week. This was an important issue, because the team members felt that it jeopardized their service towards the client. The team leader was aware of this problem: it's clear the team members can talk freely to their team leader about problems and things they do not want to go wrong. Team members know where their feeling of insecurity comes from: clients are forgotten or get the wrong information. The interviewees state that when they perceived these signs that something went wrong with the planning, they were not sure what the cause of this was. However, they knew it had something to do with the service phone. All changes in the planning have to go through the service phone, they cannot be made directly between the team member and their client.

The team members have a two-week system: for the upcoming week, they report everything to their team leader who has to make the changes. In the current week, team members have to report changes in the planning to the service phone and those colleagues have to warn the clients about this. Team members specify that sometimes this goes wrong, and clients are not properly warned, or changes are not effectively communicated within the team (e.g. when a team member has to take over a shift from a colleague). The team thinks the service phone is the cause of these planning issues. They notice clients become more demanding and their planning system is not adapted to that. They state there are too many steps in the work routine to change things. A general awareness arises that the procedure of the service phone does not really work.

6.4.3. Pattern recognition

Cause
Team members systematically and intentionally engage in inquiry with relevant information sources, concerning what is going on in a critical domain, with the intent to uncover signs of potentially systemic failure early on.

This part is not really present. The team does engage in inquiry with relevant information sources, but this is limited to "team meetings" and open conversations between colleagues. There's no systematic inquiry about critical domains.

Part 1 & 2
Team members memorize or record a broad range of "chunks of experience" concerning (past) events, context variables… in a sufficiently fine-grained way, including their own early interpretations as reflecting their possible biases.

Because of the limited inquiry, there only is information about signs of systemic failure when mistakes are already happening. Clients have been getting wrong information or team members get the planning wrong. The trigger of this mechanism is not fully present, which means the team members won't be able to record a broad range of information about past events. The information is not retained early enough. Afterwards, they recognize problems and issues, which enables them to change their way of working. Unfortunately, mistakes have already occurred by then.

Outcome
With the addition of a piece of information, a hunch suddenly emerges (from the team members' sub-conscious) that this new information, in the context of the retained information, is indicating an emerging systemic failure.

The team wasn't able to notice nor prevent an emerging systemic failure. Mistakes were already happening when the team felt like their way of planning was the source of the problems.

6.4.4. Cognitive dissonance

There were various reasons why the team members had problems with the planning: mistakes happen because a lot has to be changed in the second week, there's not enough time to make the planning and the planning gets complicated. Team members explain how they hated the chaotic process of making the planning (see C1). During team meetings, team members discussed mistakes in the planning where the workflow routine didn't go as they expected (see P1 and P3). For example, they go to a client's home and the client doesn't answer the door: then they know they probably have the wrong information and the client is not happy with this. The team leader explains how team members feel like they don't have enough time to discuss client situations, because their time goes to planning (see P2). However, not discussing clients could lead to team members missing vital information.

Interviewees state this kind of issues are generally discussed at team meetings, where they discuss events/problems/frustrations. However, they don't specify how they searched for social support for this case specifically (see P3). Temporary work agreements consisted of making the planning for two weeks but notifying the client of the first week only (see P4 and P5). Then there would be less changes to report to the client. However, the team leader stated that after a while they noticed that still a lot of changes had to be made to the planning. At one point, the team members pointed these problems out to the team leader (see P7), because the problem had escalated for them: the planning caused

them a lot of uncertainty and frustration. The team leader encourages the team to change the work agreements when experiencing this problem.

This is why the team decided to make the planning for one week instead of two, together with the whole team at the team meeting and notify clients for one week. The week after, two team members make the planning for the second week. This way, the team doesn't have too much "meeting hours" and they still have some time to discuss clients at their team meeting when everyone is present. The team members come up with alternatives as to how to go about normal work activities (see observations P4, P5 and P6). The team leader reacted with talking about the issue together with the team (see P8) and steered the team in the direction of a solution with appointing two team members responsible for the planning in the second week (see P9). The team members feel like they have more control on the planning and less mistakes happen, also they have more time to talk about clients (see P10). The outcome of the mechanism of Cognitive Dissonance shows that the team members got convinced to try out a rotating system in which every team member had to be the one to make the planning in the second week at least once.

6.4.5. Perspective Taking

An official document, sent by the team leader, informed the team members about the planning issue and what they are going to do to try to fix it (putting it on the agenda officially, see C1). The team reported this to their team leader who took initiative to do something about it by talking to each other and trying to figure out a solution together with the team. The team leader insisted on updating the planning procedures after the team members were experiencing all these problems with it. The team feels like the problem is mainly caused by the service phone, because there are too many steps to change something in the planning: colleagues who operate the service phone have to communicate changes and warn clients about changes for the current week, team members cannot contact their clients directly. However, team members are not sure this is the only cause of the problem, because it could be that they forget things or that their team leader forgets (see P1). Team members discuss this problem on the team meeting, initiated by the team leader (see P2).

The decision-making process was gradual: the team members state that the new work agreements were not decided on all at once. At various meetings, the team members' viewpoints were discussed and together with their team leader, they tried to find an adequate solution (see P3). Until a certain point where at a team meeting it was decided that two team members were going to get a "star role" for planning and that they were going to make the planning in the second week. The team members had a say in this, and the idea came partly from them, but it was the team leader who decided that every team member would have to try out this role as a planner (see P4). The team members explain how some of them really didn't want to do this, but they were okay with trying it out one time. After this "rotation", the team picked three members who liked to make the planning (and were good at it!). They take care of the planning now. The next step was for the team leader to let them do it on their own, without the team leader being present (see P5). The team reports less mistakes in the planning and a more fluent process of planning. The time that is freed up, because the team plans for only one week during the team meeting, can be used to discuss clients. This evaluation is written down in an official document by the team leader (see outcome).

6.4.6. Motivation

The team is clearly concerned with the planning issues, since they feel their clients are not happy with the service and they become harder to deal with. Team members state that their planning system is not flexible enough to provide good service, this has been the motivation to let their team leader know what's going on (see C1). They do not want the planning to go wrong, because they feel like it hurts

the quality of their work and it's frustrating for them as well, see also P1. The team members did consult their team leader about this problem (see P2). The team leader took the lead in solving this problem but made sure everyone could add to the discussion and search for a solution. The team leader challenges the team members to think about this and try to figure out what they could do to solve the problem. Everyone wanted to contribute, because the team leader proposed that everyone should try out the new role of the planning person and then afterwards the role would be appointed to three fixed team members (see P3). The solution was decided on during a team meeting (see P4). The team members are satisfied with this solution, as they don't have to take on this role permanently if they don't want to and they feel like there are less mistakes in the planning (see outcome).

6.4.7. Conclusion case 2

In this case, we were not able to observe the mechanism of intuitive pattern recognition. Again, some mistakes were observed – which means early signals (cues) were not memorized or recorded. The lack of systematic inquiry on key domains could be the reason why the mechanism is absent here. If they would have had this inquiry, they could have detected the problem before it became a real issue. As for the other mechanisms, team members are immersed in a process of organizing, because of the presence of changes in the workflow routines. Team members experience the feeling of cognitive dissonance, when facing planning issues. They engage in tactical control, as a way to deal with this issue. This is observed when they communicate this planning issue to their team leader and when the team leader facilitates the decision-making process. Unfortunately, this happens after observing mistakes made in the planning (miscommunications and frustration).

Because the team leader does not want the current work agreements to stand in the way of a good work organization, the team leader encourages the team to discuss possible solutions and engage in that solution. Therefore, we could conclude that the mechanism of Motivation is more apparent for the team leader than for the team members. However, they are invested in the solution and they state the solution also came partly from them. The team leader pushes them to move forward and puts this in official documents, detailing new work agreements. The team leader has a vital role in this organizing process through tactical control, but team members also engage in a sensemaking process where they try to understand the problem, discussing the different solutions and making agreements.

Table 18: Mechanistic sketch case 2: Intuitive pattern recognition

Cause	Part 1	Part 2	Outcome
Start of inquiry	Gathering information	Mentally browsing information	Integration (bracketing information leads to new insights)
Team members systematically and intentionally engage in inquiry with relevant information sources, concerning what is going on in a critical domain, with the intent to uncover signs of potentially systemic failure early on.	Team members memorize or record a broad range of "chunks of experience" concerning (past) events, context variables… in a sufficiently fine-grained way, including their own early interpretations as reflecting their possible biases. 	Inquiring team members mentally browse (some of) the retained information in a variety of ways, while continuing to add new information from ongoing probing, from others within or outside the team.	With the addition of a piece of information, a hunch suddenly emerges (from the team members' sub-conscious) that this new information, in the context of the retained information, is indicating an emerging systemic failure.
Analysis			
This part is not really present. The team does engage in inquiry with relevant information sources, but this is limited to "team meetings" and open conversations between colleagues. There's no systematic inquiry about critical domains..	Because of the limited inquiry, there only is information about signs of systemic failure when mistakes are already happening. Clients have been getting wrong information or team members get the planning wrong. The trigger of this mechanism is not fully present, which means the team members won't be able to record a broad range of information about past events. The information is not retained early enough. Afterwards, they recognize problems and issues, which enables them to change their way of working. Unfortunately, mistakes have already occurred by then.		The team wasn't able to notice nor prevent an emerging systemic failure. Mistakes were already happening when the team felt like their way of planning was the source of the problems.

Table 19: Mechanistic sketch case 2: Cognitive dissonance

Cognitive dissonance reduction causal mechanism - Ideal type							
(1) Pathway: Search for information and talking to the team (linear sequence)							
Theory							
Cause – Motivational force as a sense of urgency	**Pathway**	**Voluntary exposure to information**		**Pathway in linear sequence**	**Building social support**		**Common awareness intention**
		Part 1	**Part 2**		**Part 3**	**Part 4**	**Part 5**
Due to the dissonance caused by 'unexpected events' [violation of expectations] at work, individual team member feels pressure to reduce it because he/she is aware that unresolved dissonance could interfere with (1) his/her effective job performance' and group performance, and (2) because it is psychological unpleasant.	***Search for information***	Individual team member **seeks out** for information about the sources of this 'cognitive discrepancy' (the salient cues not prevented by the current mental models) - by collecting material with the expectation to achieve consonant cognition with the existing cognitive elements.	Individual team members **identifies** some dissonant-increasing new information: 'actual signs of trouble deserve closer attention'.	***Dissonance is not reduced, so next pathway talking to team members to reduce cognitive dissonance***	Due to this increase of dissonance, individual **team members search** for social support - by **communicating** the perceived signs of trouble to other **peers** - in order to know what to do.	**Team members listen** to each other about their concern and **agree** that, even if, a long-term solution is imperative for this cue, some urgent measures need to be implemented, because the cue has escalated.	Due to this escalation, some kind of common awareness is established within team about the possible slippage of the cues if they are not managed on time and the bad consequences for the team performance. Thus, using this argument, team members craft some kind of solutions they can provide individually from their autonomy [e.g. re-planning].
Case 2: Planning							
Team members are frustrated and stressed about current work routines. There are various reasons for that, one of them being the changes in the planning that occur and cause mistakes.		*Team members try to reduce the unpleasant feeling by trying to figure out how to go back to their work routines and take care of the issue. They state talking about it regularly in order to find out what would work.*	*Team members mention having no time to discuss client situations, which could cause errors.*		*Interviewees state these kind of issues are generally discussed on team meeting, where they discuss events/problems/frustrations. However, they don't specify how they searched for social support for this case specifically.*	*Frustrations about the planning had been there for a long time. From this point on, the team starts looking for a solution.*	*Team members specify problems they have with the planning: there's no time to discuss clients and a lot of errors occur (see also pattern recognition mechanism) and state this was the idea behind changing the work routines.*

Uniform reaction	**Pathway in linear sequence**	**Uniform reaction**	**Elephant in the room**		**Reducing discrepancy**	**Outcome - dissonance is reduced**
Part 6		**Part 7**	**Part 8**	**Part 9**	**Part 10**	
As they are searching for solutions, **team members debate** that such solutions are not sustainable for a long-term period producing a uniform within-team reaction, that some actions need to be taken and approved by the team leader because of his expertise and experience.	***Dissonance is not reduced, so next pathway talking to team leader to reduce cognitive dissonance***	**Team members decide to communicate** their concerns to team leader with arguments about their preoccupation with the failure, in order to search a final solution to the escalated problem.	Team leader **listens** and **notices** that the issue is important for the whole group and deserves attention. (team leader cannot pretend that nothing's wrong and the rest of his/her team knows there is - it can be really problematic).	**Team leader confirms** the importance of the problem and **manages** the discussion by proposing some kind of problem-solving setting with the whole team as a way to increases the likelihood of recovery and continuing reliable performance.	Team members **agreed** with the existing proposal because they feel listened to/taken seriously as the issue is put on the agenda by the team leader for its resolution. The cognitive discrepancy is reduced, although not yet eliminated.	Total dissonance is reduced, internal balance/harmony is restored because the 'perceived issue' is on the agenda for a solution
Case 2: Planning						
The team members were concerned about the sustainability of the solution presented. Team members mentioned to the team leader they thought the new work agreement "didn't make sense". So, they decided to change it, this work agreement was not feasible in the long term.		*At one point, the team members pointed these problems out to the team leader, because the problem had escalated for them: the planning caused them a lot of uncertainty and frustration.*	*Team leader explains that they don't have an answer immediately, but that they talk about it within the team, trying to find a solution.*	*The process of finding a solution seemed to be a joint process between the team members and the team leader, but the final decision was in the hands of the team leader.*	*The new work agreements about the planning are received well, but this also consists of two team members having to make the planning during the second week. For this task, there's a rotation system: everyone should do it. Team members state that making the planning isn't something every team member likes to do. There were many team members who said: I'd rather not do that.*	*The long-term solution is still on the agenda at this point, to be discussed how the team should handle this (see mechanism Perspective Taking).*

Table 20: Mechanistic sketch case 2: Perspective taking

Theory						
Cause	**Part 1**	**Part 2**	**Part 3**	**Part 4**	**Part 5**	**Outcome**
Team member detects a disturbance during the operation of her/his work activities.	The **team member** **tries to find** an adequate explanation (cf. to make sense) for the observed disturbances in terms of the team work organization (drawing on her/his existing knowledge about the work organization) that enables her/him to design an adequate solution but **is unable** to do so.	The **team member** **contacts other team members** to explain and discuss the problem situation in order to find an explanation that enables an adequate solution.	**Team members** **share** their experiences (cf. exemplars) with problems, their pending explanation of the problem situation in terms of the work organization and **facilitate** mutual understanding.	**Team members** **discuss each other's** experiences and explanations by **identifying** similarities and differences (incl. contradictions) between explanations in terms of the problem and solution.	**Team members** **propose and discuss collective solutions** (using pending the individual understandings of the problem situation and solution within the team) **and reach agreement** based on convergent individual perceptions of the solution at least being relevant and adequate* in solving the problem situation. *The solution is consistent with how a team member understands the problem situation.	Team members hold a shared perspective on what needs to be done.
Case 2: Planning						
An official document, sent by the team leader, informed the team members about the planning issue and what they are going to do to try to fix it.	*The team feels like the problem is mainly caused by the service phone, because there are too many steps to change something in the planning: team members cannot contact their clients directly. However, team members are not sure this is the only cause of the problem, because it could be that they forget things or that their team leader forgets.*	*Team members discuss this problem at the team meeting, initiated by the team leader.*	*At various meetings, the team members' viewpoints were discussed and together with their team leader, they tried to find an adequate solution.*	*Until a certain point where at a team meeting it was decided that two team members were going to get a "star role" for planning and that they were going to make the planning in the second week. The team members had a say in this, and the idea came partly from them, but it was the team leader who decided that every team member would have to try out this role as a planner.*	*The team members explain how some of them really didn't want to do this, but they were okay with trying it out one time. After this "rotation", the team picked three members who liked to make the planning (and were good at it). They take care of the planning now. The next step was for the team leader to let them do it on their own, without the team leader being present.*	*The team reports less mistakes in the planning and a more fluent process of planning (see outcome observations). The time that is freed up, because the team plans for only one week during the team meeting, can be used to discuss clients. This evaluation is written down in an official document by the team leader.*

Table 21: Mechanistic sketch case 2: Motivation

Theory					
Cause	**Part 1**	**Part 2**	**Part 3**	**Part 4**	**Outcome**
Team member(s) detect(s) a work-related problem	The **team member** **feels addressed to take action** by emphasizing the importance of effective performance of the team task.	The **team member** **assesses** her/his range of possible actions*, **realizes** that the problem can only be adequately solved at the team level and **takes initiative to contact** other team members to explain the problem situation in order to mobilize 'team resources' to deal with the problem situation. *(considers his control opportunities)	**Team members** **discuss** the problem situation using an appropriate style of interaction so that **they** **feel addressed to take action** and **express their willingness** to personally contribute to solving the problems or assign team resources.	**Team members** **engage** in problem solving using an appropriate style of interaction so that **they** **make a focused effort** and **invest team resources** until a solution is found that is deemed adequate to deal with the problem situation.	**Team members** come up with a work solution to the problem situation and commit to it.
Case 1: Permanent absence					
The team is concerned with the planning issues, since they feel their clients are not happy with the service and they become harder to deal with. Team members state that their planning system is not flexible enough to provide good service, this has been the motivation to let their team leader know what's going on.	*The team does not want the planning to go wrong, because they feel like it hurts the quality of their work and it's frustrating for them as well.*	*The team members consulted their team leader about this problem.*	*Everyone wanted to contribute, because the team leader proposed that everyone should try out the new role of the planning person and then afterwards the role would be appointed to three fixed team members. So they knew it wouldn't be a permanent role if they didn't like it.*	*The solution was decided on during a team meeting.*	*The team members are satisfied with this solution, as they don't have to take on this role permanently if they don't want to and they feel like there are less mistakes in the planning.*

6.5. Case III: Interns

About the organization:

Organization 1 is divided into 18 regions in Flanders, of which T. is one. T. consists of the whole region Noorderkempen. There are 600 employees: mainly caretakers, cleaning personnel, sitters… There is a project living assistance and there's a day center for elderly people.

In T. 30 employees who help guide the whole operation are based there. The subregional team (SRT) in T. consists of 11 people (care partners). Most of them are in charge of four teams of care workers. There are also employees who don't have care teams, they have a support function (e.g. someone who takes care of the service phone).

About the case:

For the team members, it wasn't clear which agreements were made concerning interns. The team member in the interview stated he/she was replacing a colleague and all of a sudden he/she got a phone call from a school announcing the start date of an intern. The team member didn't recall anything about this intern, and he/she thought neither did the colleague he/she was replacing, because otherwise he/she would have been briefed about this. Because of the unclarity regarding intern introductions, the team member sent an e-mail to HR-colleague A to ask about the introduction: who is responsible for this? Before, B used to take care of everything related to the interns, the only thing the care partner had to do was get acquainted and possibly give the intern a schedule. Then this task went from B to A and it was chaos: it was not clear anymore who was responsible for what. The team members expect that the tasks will not be executed, because of a lack of clarity about responsibility. However, this issue has been brought up because of a phone call from a school, not because of systematic inquiry between team members. We cannot confirm the mechanism of intuitive pattern recognition.

The team contacts A, because this colleague is responsible for everything HR-related, and the unique skills of this team member are needed to clarify the current work agreements. A responded that the team member should take care of the intern introduction. The team leader stated that the work agreements concerning interns were indeed not clear, so the issue remained on the agenda for a long time, which enables us to confirm the outcome of the cognitive dissonance mechanism. Also, the team leader emphasized the importance of changing current procedures, making the agreements clear for everyone.

Both the team leader and the team members hold the same perspective that taking care of the introductions is too much extra work for the care partners. However, the team leader states this was not easy for the HR-colleague, because it means a lot of extra work for him/her. During a meeting the team leader and HR-colleague came to the agreement that intern introductions are not the responsibility of the care partners. We can observe that the team leader sent out an official communication ("ECHO") in which a few work agreements concerning the interns are specified, e.g.: "It's not the role of the care partners to organize the introductions for the interns". This document is a report of a meeting from the team leader and A, sent to the star roles of each team, who are supposed to communicate this to their entire team.

However, when asking about the solution and whether this is evaluated as relevant and adequate, the team members answered they had no idea what the latest agreements are (see perspective taking mechanism). The team member feels addressed to take action, because the school called him/her, so something had to be undertaken in order to know what to do next. But we cannot observe the task being of personal significance to the team member (motivation mechanism). We cannot say the team

members are committed to the problem situation, as they stated to only worry about the problem when it occurs. Also, the team leader stated it wasn't easy to gather information about the problem: it took the team members a long time to gather information about experiences with interns and communicate this to the team leader. Therefore, we cannot entirely confirm the outcome of the motivation mechanism.

Conclusion:

The process of organizing differently is present is this case. However, we cannot confirm the presence of all four mechanisms. From the key parts analysis, we can observe that perspective taking mechanism and the motivation mechanism are not fully confirmed. The team leader is motivated to find a solution to the problem, as part of tactical control, through the search for information, organizing meetings and designing a solution. The team members, however, were not really involved in the design of the solution, which means that they were not fully engaged in tactical control, but rather their opinions were gathered and taken into account. We observe an absence of "Preoccupation with failure" in the team members behavior, which means they are not concerned with the problem until a problem occurs, putting in evidence that sensemaking was not triggered as a process, at least when it comes to noticing earlier cues. Work pressure could be a cause of this: as care partners already have an unbalanced workload, it could be that interns are not an actual priority for them.

6.6. Case IV: Weekend work arrangements

About the organization:

Organization 1 is divided into 18 regions in Flanders, of which L. is one. The team we interviewed in L. consists of 10 care workers and 4-5 cleaning staff. Since September 2019 this team is mixed: care workers and cleaning staff are part of the same team. The team has a bi-weekly team meeting with all care workers and their team leader to discuss clients, specific situations and other work-related issues. Once a month, cleaning staff also attend this meeting. The team leader chairs the meetings (in charge of time and agenda management). Every week the planning is made by three team members, planning for the cleaning staff is made on a monthly basis.

About the case:

The team is expected to work during the weekend, so agreements have to be made about who works when. No team member is obliged to work during the weekend, it's voluntary, but it has to happen. The team leader stated he/she detected a lot of frustration concerning these agreements, which caused the feeling of cognitive dissonance for the team members. However, the team members in the interview did not report searching social support with their peers concerning these issues. The team leader puts the topic on the agenda (outcome cognitive dissonance) and in the perspective taking mechanism a solution is designed. The team leader notices the current procedures are frustrating to certain team members and he/she decided to talk about this during a meeting, with the aim of changing the current procedures for the better and reducing frustrations for the team members.

Team members report the team leader asked everyone who works during the weekend how long a client visit takes. The team members engaged in the discussion, the responses varied from 1 hour to 2 hours. It seemed that the frustrations were about this imbalance. The solution consisted of a compromise: a client visit during the weekend can take 1,5 hours maximum. The team members reported that this was going well, leading to a shared perspective on this issue (outcome perspective taking). Team members do not feel addressed to take action, because they didn't report issues around weekend work. Their motivation to solve this problem seemed low. The reason for this could be that

the team members who have these frustrations were not in the interview or that they know of the frustrations, but they don't want to talk about it in order to avoid problems with their colleagues. Therefore, we cannot make a conclusion on the motivation mechanism for the team members.

Conclusion:

The team leader starts the process of organizing, including tactical control. Because she shows characteristics related to a coherent leadership endorsement of preoccupation with failure, the team leader engages in a sensemaking process when identifying cues at work. Pattern recognition and motivation are mainly present in the team leader's behavior. The team leader notices the cue, and brackets it, searching for information with team members with the aim to organize the workflow differently, modifying the current procedures in order to reduce frustrations with the team members. The main reason for team members to start tactical control, could be that the team members who experienced the disturbance (who had the frustrations) were not present in the interview to provide further information about a possible early detection of cues, therefore our information is not complete. In addition, there is no information about team members searching social support. We know that perspective taking took place, because the team members who work during the weekends could share their experience and a compromise was made with this information. This led to a solution that was evaluated as adequate and relevant by the team members.

6.7. Case V: Planning outside working hours

About the organization:

Organization 1 is divided into 18 regions in Flanders, of which R. is one. The team we interviewed in R. consists of 11 care workers and 3 cleaning staff. Since the beginning of 2019 this team is mixed: care workers and cleaning staff are part of the same team. The team has a bi-weekly team meeting of 1,5 hours with all care workers and their team leader to make the planning, discuss clients, specific situations and other work-related issues. Once a month, cleaning staff also attend this meeting. The planning has to be prepared individually at home for two weeks, preparation for the cleaning staff is made on a monthly basis.

About the case:

Team members state that they spend private time to make their work planning. In busy weeks team members call each other about 20 minutes and spend 10 minutes on the planning. That's approximately half an hour a week. Their pattern recognition learns them that not calling each other or not preparing this in their private time, would result in chaos. Therefore, the team members end up with the feeling of cognitive dissonance concerning preparing the planning outside of their normal working hours. It's not clear if they searched for social support, but the team members talked about calling each other to make this planning and asking each other before the meeting to take over clients etc., could also be seen as a form of social support. Either way, the team members feel the same way about using their private time to plan and they seemed to have discussed this among each other.

From the perspective taking mechanism, we learn that the team members have not yet discussed this explicitly with their team leader. However, the team leader is aware of the frustrations within the team and he/she did put it on the agenda. The team leader asked the team members during a performance review: what do you think of the planning system and about planning during private time? One of the team members explained: "I don't need private time for this, I do this at the client's home during working hours". This resulted in a solution, proposed during a team meeting. However, not every team member was aware of this. It was probably discussed during a meeting without the cleaning staff. It's important to point out we need to disconfirm the key part of the mechanism

perspective taking, where solutions are evaluated as relevant and adequate. The team members state it is not feasible to prepare the planning at a client's home. There's no shared perspective, because the team leader states it is feasible during working hours (see example of this one team member), but many do not like to discuss this with the client. When we look at the motivation mechanism, we can conclude that the team members think that their team leader knows about their frustrations, but it seems that they don't really feel addressed to take action. The team leader is in fact aware of this, but he/she concludes there's resistance towards the proposed solution and doesn't seem to plan on taking further action. So the outcome of the motivation mechanism: a work solution to the problem the team members are committed to, is not present.

Conclusion:

Team members and the team leader know of the existence of this disturbance and the consequences it has (frustrations for the team members) for the employees and their job performance. The team leader is also aware that the proposed solution to the problem is inadequate. An organizing process is necessary. However, no one seems to be addressed to take action. More "Reluctance to simplify" could maybe spark a discussion between the team members trying to find an alternative solution. We did not find that in this case, though. The "Coherent leadership endorsement of Preoccupation with failure" is present up to a certain point, because the team leader asks about the experiences with the planning during performance reviews. However, when the team leader finds out that the solution is inadequate, there's no follow-up, the team leader doesn't insist on updating procedures. It seems that the organizing process did not take longer or was not taking seriously. The lack of the conditions related to Organizational Mindfulness and Mindful Organizing could be the reason why this case is atypical (no solution is found), showing no tactical control and no ongoing organizing process.

6.8. Case VI: Mobile hoist

About the organization:

Organization 2 consists of two residential care centers: K. and B.. In the K. building there are two teams. The team leaders of both teams are in close contact with each other. The team we interviewed consists of 19 people (care workers, nurses, animators, cleaning staff…). A typical workday starts at 6h45 in the morning with a briefing where the night shift ends their shift. Then there's another briefing at 10h to talk about how the morning went and the shift ends at 13h15 (nurses sometimes stay until 15h15). At 14h there's a briefing to change to the afternoon shift. The evening shift is the busiest. At 21h30, the fixed (cf. always the same team members) night shift starts. There are 30 residents in K..

About the case:

The team members have made clear work agreements about the use of the mobile hoist. Use thereof is mandatory to get some residents out of bed safely and put them on the toilet for example. This is mostly based on the physical capabilities of the residents. One of the interviewees, a team member, caught a colleague not using the mobile hoist when it was needed. This colleague was not respecting the rules. The team member was accidentally near the resident when the beeper went off, the resident had called the care worker because he/she was done going to the bathroom. So when the team member comes into the room, he/she sees the resident sitting there without mobile hoist to stabilize him/her. As soon as that colleague came back, the team member who found this situation addressed the issue. The team leader explains how the mobile hoist prevents residents from falling and care workers from having complaints and back problems. He/she also specifies which consequences not using the mobile lift could mean for the organizational framework: family members expect care workers to use the mobile hoist, therefore they would be angry if the resident would fall,

because that would mean care workers are not doing their job correctly. This shows the importance for both team members and the team leader. The team member who caught their colleague didn't go to the team leader about this, but the team leader states this topic had been discussed during briefings. Advantages and irritations are discussed (see cognitive dissonance mechanism).

It's also discussed how this mistake could have been prevented: by using the mobile hoist. The solution proposed is not a compromise: the mobile hoist has to be used, the rules have to be followed. The team leader states that most team members individually have grown to evaluate the solution as relevant and adequate, as it made sense given the initial problem it tried to deal with (see perspective taking mechanism). The team leader is closely involved in the daily operations and is always accessible if something would happen, it seems he/she has a good overview of what happens on a daily basis. Residents sometimes try to get team members to help them manually instead of with the mobile hoist, but then the team leader is always there, and he/she has the authority to act and demand that the hoist is used.

The team leader states the team members eventually learn to see the advantages of using the mobile hoist. It's clear the team leader is motivated to make sure the team members use the mobile hoist, not only for the resident, but also for their own health. The fact that one of the team members detects the problem, shows that the team task is of personal significance to this team member.

Conclusion:

We can conclude that the importance of using the mobile hoist is emphasized by the team leader during briefings and this is also very important to certain team members. However, a single disturbance would not be reported on a briefing. The team member states that if these disturbances would happen more often, this would be a topic at the briefing or at a meeting, but a single occurrence would not. The team leader states that the team members discussed this and that they grow towards accepting that the mobile hoist is a safer option for everyone. The "Coherent leadership of Sensitivity to operations" is an important condition here, because the role of the team leader is definitely a factor in obeying the rules: if the resident is counteracting, the team leader can always step in. Also, the team leader really emphasizes the importance of using the mobile hoist. Its personal significance and importance are felt by the whole team, because of repetition during briefings on the one hand and the emotional reactions to not obeying the rules on the other hand (e.g. the team member who caught their colleague). The perspective taking consists of emphasizing the importance of obeying the rules by the team leader. Eventually, the solution (=obeying the rules) seems to be accepted by everyone, according to the team leader, because the advantages of using the hoist are seen by the team members (better for the resident: safer and healthier also for the team member's back). But there are obviously some differences between team members (to whom the problem is more important or less important).

6.9. Case VII: Incontinence

About the organization:

Organization 2 consists of two residential care centers: K. and B.. In the B. building there are three teams, each operating on one floor of the building. The team we interviewed consists of 18 people (care workers, nurses, animators, physiotherapists, cleaning staff…). Every 5-6 weeks there's a team meeting where everyone can add a topic to the agenda to be discussed. One of the team members chairs the meetings, in a rotation system (in charge of time and agenda management). During the morning shift, at 10h there's a briefing, a short meeting to discuss how the day is going. The afternoon

shift also has these short briefings. The team appointed team members as “star roles” for certain topics, for example laundry, incontinence material, wound care…

About the case:

The team members of the night shift detected a problem with the incontinence material of one of the residents during the night: the resident woke up in the morning in a wet bed. The team members of the night shift communicated this to their “star role” colleague of the day shift via messages on the documents for the incontinence evaluation. This team member has a star role for incontinence, which means this is the person who decides which resident gets which materials. The night shift colleague wanted to use a certain type of diaper, but the star role colleague didn’t agree. This is where a disturbance originated. The work agreements proposed by the star role team member were deemed insufficient by the night shift team members, which led to discussions.

The reason why the star role team member didn’t want to change the material, was that the evaluation forms were not filled in properly. The star role doesn’t change anything about incontinence if it’s not properly evaluated. This resulted in 2-3 weeks of the same system, so the night shift became frustrated, thinking the star role didn’t do anything about this problem and ignored it (cognitive dissonance). These feelings of frustration were communicated to the star role colleague by the night shift team members during the 15 minutes they saw each other at the end of the night shift. Then the night shift colleagues said: “Please to something about it.”, but the star role colleague answered he/she couldn’t because of the bad evaluation papers. Important to note is that the night shift team members filled in the evaluation papers quite okay, it was a problem for the day shift papers. At this point, the night shift colleagues wrote down on the evaluation papers: “do something about this” in bold letters. So the frustrations were high. The star role team member also pointed this out: please fill in the papers, because I can’t do anything.

The star role colleague went to the team leader to ask: “what should I do about this?”. The team leader put this topic on the agenda by putting them together to talk about the agreements. The team leader proposed: “what if we appoint a star role for incontinence for the night shift?”. One of the night shift colleagues volunteered. The star role colleague of the day shift explained he/she wasn’t right behind this suggested solution. He/she was afraid this new role would interfere with the existing star role. These concerns were expressed, and the volunteering night shift colleague assured the existing star role that he/she wouldn’t interfere with the day shift, only keep an eye on things during the night shift. This reassured the star role colleague and so the solution was eventually evaluated as relevant and adequate to deal with the issue. The star role colleague confirms the new way of working is easier (see perspective taking mechanism). So the team members hold a shared perspective. The issue seems of personal significance to the team members, the interviewee who holds the star role explains multiple times how he/she only wants the best for the resident and how he/she tries to make them as comfortable as possible. The team members have come up with this work solution and they are committed to it (outcome motivation mechanism).

Conclusion:

Team members cannot immerse in organizing without the intervention and suggestion of the team leader to come to a work solution. This situation where the night shift team members felt ignored lasted for about three weeks, because the star role team member couldn’t make decisions without the evaluation papers. However, the night shift team members did not really have an influence on these papers, because their papers were filled in quite okay. This makes us conclude the “Commitment to resilience” within the team is not very strong, because this situation with the badly filled in

evaluation papers lasted a few weeks. The team did not really discuss how this could have been prevented (noticing). Only when the team leader steps in, the situation accelerates, and a solution is proposed (tactical control from top management). In this case, the behavior of the team leader could be an example of a team member (with power) showing 'reluctance to simplify' by bringing the two parties together and insisting on changing the procedures (new star role) into a clear organizing process. Essentially forcing others to get together and talk. This case shows a nice example of the perspective taking mechanism, because by sharing perspectives, the solution is evaluated as adequate. The star role team member expresses concern and the other team member is able to reassure him/her, which leads to a work solution that the team members are committed to.

6.10. Case VIII: Contingency plan

About the organization:

Organization 2 consists of two residential care centers: K. and B.. In the B. building there are three teams, each operating on one floor of the building. The team we interviewed consists of 22 people (care workers, nurses, animators, physiotherapists, cleaning staff…). The team is responsible for 38 residents. During the morning shift, at 10h there's a briefing, a short meeting to discuss how the day is going. The afternoon shift also has these short briefings. The team appointed team members as "star roles" for certain topics, for example laundry, incontinence material, wound care…

About the case:

The contingency plan came about because the team leader had a few days of vacation. The team members had a full occupation that day, but still there was chaos and the team felt like they couldn't do all the work they had to do with the people who were present at that time. The team members called their team leader, saying: "It's 11h and the last resident still has to be washed, how is it going to be during the weekend?" and so on. They were panicking. At a certain point they went to the management, because the team leader was absent, and this was the problem. The team didn't discuss alternatives as to how to get the work done that day and is not taking advantage of the skills of certain team members to be able to solve the problem (e.g. team members take on other roles or help out with other tasks than their normal work day activities). However, it could be that there was too much work and that it was really impossible with the occupation at that time and no team members could take on extra tasks.

The team members state they had talked to one another about taking over for colleagues, it became too much for them (see cognitive dissonance mechanism). For the team leader, this issue was on the agenda, but not because the team members officially communicated this to him/her. The team leader put it on the agenda on his/her own initiative, because the team members went to management during the few days of vacation the team leader had. This is why the team leader took the initiative to make a "contingency plan". This is an official structure (a few work agreements) the team members can rely upon when they don't have enough resources. An example of such a work agreement is that the physiotherapist and the animator come earlier to help out with the morning shift. This was something the team already did, but the team leader gave it a name and made it a more official procedure. It was presented during a team meeting. The team leader wanted to have input from the team members on that plan, but the team members didn't give suggestions or comments on the plan. The team leader states he/she thinks this plan gives the team members peace of mind during busy days, because they have to talk to one another to get all the work done. It's not clear what the team members think of the plan, it seemed during the interview that it wasn't yet encapsulated in the team's procedures. The team members did know the plan and the name ("contingency plan"), but it

seemed like it still had to gain a little bit of support with the team members. So we cannot confirm the outcome for the perspective taking mechanism.

As for the motivation to solve this disturbance, the team leader states: “There are also people who simply panic when things don't go as normal. And that also means that some people are drawn into that negative spiral. (…) I still feel that very much, I still miss that a bit, because I expected that after four years it would be there anyway (cf. the autonomy)." The team leader wanted to give the team members something to hold on to, some kind of structure to be able to deal with the chaos. The team leader is committed to this solution, but the team members still need some convincing.

Conclusion:

The team leader takes the initiative to put the existing work agreements in a fixed structure, it seems the team members need this to be able to function when resources are limited. The team leader does ask the team members for input on this solution, but nothing comes from that. So we could assume the team members comply with the solution. However, we don’t know to what degree the team members are happy with this solution. It seems the team lacks “Reluctance to simplify”, discussing alternatives as to how to get the work done that day and “Deference to expertise” taking advantage of the skills of certain team members to be able to solve the problem (e.g. team members take on other roles or help out with other tasks than their normal work day activities). The “contingency plan” has to gain exposure with the team members.

The table below shows which key parts (in grey) the analyses of cases 3-8 focused on per mechanism.

Table 22: Key parts Intuitive pattern recognition

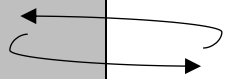
Cause	Part 1	Part 2	Outcome
Start of inquiry	Gathering information	Mentally browsing information	Integration (bracketing information leads to new insights)
Team members systematically and intentionally engage in inquiry with relevant information sources, concerning what is going on in a critical domain, with the intent to uncover signs of potentially systemic failure early on.	Team members memorize or record a broad range of "chunks of experience" concerning (past) events, context variables… in a sufficiently fine-grained way, including their own early interpretations as reflecting their possible biases. 	Inquiring team members mentally browse (some of) the retained information in a variety of ways, while continuing to add new information from ongoing probing, from others within or outside the team.	With the addition of a piece of information, a hunch suddenly emerges (from the team members' sub-conscious) that this new information, in the context of the retained information, is indicating an emerging systemic failure.

Table 23: Key parts Cognitive dissonance mechanism

Cognitive dissonance reduction causal mechanism - Ideal type							
(1) Pathway: Search for information and talking to the team (linear sequence)							
Theory							
Cause – Motivational force as a sense of urgency	**Pathway**	**Voluntary exposure to information**		**Pathway in linear sequence**	**Building social support**		**Common awareness intention**
		Part 1	**Part 2**		**Part 3**	**Part 4**	**Part 5**
Due to the dissonance caused by 'unexpected events' [violation of expectations] at work, individual team member feels pressure to reduce it because he/she is aware that unresolved dissonance could interfere with (1) his/her effective job performance' and group performance, and (2) because it is psychologically unpleasant.	***Search for information***	Individual team member **seeks out** for information about the sources of this 'cognitive discrepancy' (the salient cues not prevented by the current mental models) - by collecting material with the expectation to achieve consonant cognition with the existing cognitive elements.	Individual team member **identifies** some dissonant-increasing new information: 'actual signs of trouble deserve closer attention'.	***Dissonance is not reduced, so next pathway talking to team members to reduce cognitive dissonance***	Due to this increase of dissonance, individual **team members search** for social support - by **communicating** the perceived signs of trouble to other **peers** - in order to know what to do.	**Team members listen** to one another about their concern and **agree** that, even if, a long-term solution is imperative for this cue, some urgent measures need to be implemented, because the cue has escalated.	Due to this escalation, some kind of common awareness is established within team about the possible slippage of the cues if they are not managed in time and the negative consequences for the team performance. Thus, using this argument, team members craft some kind of solutions they can provide individually from their autonomy [e.g. re-planning].

Uniform reaction	**Pathway in linear sequence**	**Uniform reaction**	**Elephant in the room**		**Reducing discrepancy**	**Outcome - dissonance is reduced**
Part 6		**Part 7**	**Part 8**	**Part 9**	**Part 10**	
As they are searching for solutions, **team members debate** that such solutions are not sustainable for long-term period producing a uniform within-team reaction that some actions need to be taken and approved by the team leader because of his expertise and experience.	***Dissonance is not reduced, so next pathway talking to team leader to reduce cognitive dissonance***	**Team members decide to communicate** their concerns to team leader with arguments about their preoccupation with the failure, in order to search a final solution to the escalated problem.	Team leader **listens** and **notices** that the issue is important for the whole group and deserves attention. (team leader cannot pretend that nothing's wrong and the rest of his/her team knows there is - it can be really problematic).	**Team leader confirms** the importance of the problem and **manages** the discussion by proposing some kind of problem-solving setting with the whole team as a way to increases the likelihood of recovery and continuing reliable performance.	Team members **agreed** with the existing proposal because they feel listened to/taken seriously as the issue is put on the agenda by the team leader for its resolution. The cognitive discrepancy is reduced, although not yet eliminated.	Total dissonance is reduced, internal balance/harmony is restored because the 'perceived issue' is on the agenda to find a solution.

Table 24: Key parts Perspective taking mechanism

Theory						
Cause	**Part 1**	**Part 2**	**Part 3**	**Part 4**	**Part 5**	**Outcome**
Team member detects a disturbance during the operation of her/his work activities.	The **team member** **tries to find** an adequate explanation (cf. to make sense) for the observed disturbances in terms of the team work organization (drawing on her/his existing knowledge about the work organization) that enables her/him to design an adequate solution but **is unable** to do so.	The **team member** **contacts other team members** to explain and discuss the problem situation in order to find an explanation that enables an adequate solution.	**Team members** **share** their experiences (cf. exemplars) with problems, their pending explanation of the problem situation in terms of the work organization and **facilitate** mutual understanding.	**Team members** **discuss each other's** experiences and explanations by **identifying** similarities and differences (incl. contradictions) between explanations in terms of the problem and solution.	**Team members** **propose and discuss collective solutions** (using pending the individual understandings of the problem situation and solution within the team) **and reach agreement** based on convergent individual perceptions of the solution at least being relevant and adequate* in solving the problem situation. *The solution is consistent with how a team member understands the problem situation.	Team members hold a shared perspective on what needs to be done.

Table 25: Key parts Motivation mechanism

Theory					
Cause	**Part 1**	**Part 2**	**Part 3**	**Part 4**	**Outcome**
Team member(s) detect(s) a work-related problem	The **team member** **feels addressed to take action** by emphasizing the importance of effective performance of the team task.	The **team member** **assesses** her/his range of possible actions*, **realizes** that the problem can only be adequately solved at the team level and **takes initiative to contact** other team members to explain the problem situation in order to mobilize 'team resources' to deal with the problem situation. *(considers his control opportunities)	**Team members** **discuss** the problem situation using an appropriate style of interaction so that **they** **feel addressed to take action** and **express their willingness** to personally contribute to solving the problems or assign team resources.	**Team members** **engage** in problem solving using an appropriate style of interaction so that **they** **make a focused effort** and **invest team resources** until a solution is found that is deemed adequate to deal with the problem situation.	**Team members** come up with a work solution to the problem situation and commit to it.

6.11. Conclusions

This project performed an analysis of organizational processes within the scope of "Modern Socio-technical Organization" (MSTO) and focused mainly on tactical control within teams to successful complex team problem-solving. We observed how team members dealt with work-related disturbances by changing the way work is organized (de Sitter, 1994: 102) within a control cycle consisting of four interconnected activities: observation of the current situation, situation assessment, action selection (i.e. solution) and implementation (de Sitter, 1994: 92,103).

In order to answer our research question: "Why (condition), how (CM) and when (context) do teams succeed to solve complex-problems when a disturbance is occurring at the workplace?" we used additional theories to be able to understand the *process* of how teams engage in tactical control or complex problem solving better.

These theories were:

- Intuitive pattern recognition to create cognitive dissonance.
- Cognitive dissonance reduction through collective cognition change.
- Perspective taking as a collective active cognitive process to understand eachother's intentions and/or emotions.
- Motivation as a collective driver to engage in problem solving.

For a well-functioning of the whole process of complex problem-solving, these theories were embedded in two interrelated contexts: adaptive sensemaking and organizational mindfulness, within the scope of sociotechnical theory.

We observe how team members behave when there is a variation in the organizational workflow that deviates from routines. They start the process of problem-solving by engaging in a tactical control cycle in which they work together to understand issues that are unexpected and unclear (Maitlis & Christianson, 2014). In addition, for an effective problem-solving, this process of organizing also operates within the context of organizational mindfulness in which employees can act in response to these issues from an organizational and social perspective by anticipating potential disruptive events (Weick et al., 1999; Weick & Sutcliffe, 2001, 2007).

Adaptive sensemaking and organizational mindfulness complement sociotechnical theory in the understanding of "a system's willingness to become aware of problems is associated with its ability to act on them." (in Weick & Sutcliffe, 2012: 66). We observe that when these contexts are present in complex problems at work, team members are able to act and become better in noticing workflow alterations. This means they can control better when there are opportunities to act (de Sitter, 1994: 205) and one can better understand the actual social-cognitive process of how team members make sense of issues at work and behave within a particular type of work structures.

First, we perform a cross-case analysis in which conclusions can be made for a group of cases. Second, the link between STDT and problem-solving is explained based on the empirical results through the concept of interdependence.

6.11.1. Cross-case conclusions

In the table below, all conclusions for the evaluation of the evidence can be found per part of the mechanism that was studied. Basically, we analyzed which parts of the mechanism are present in the case by evaluating the evidence we could find for this particular part (e.g. from the interview, extra documents, e-mail conversations etc.). The table is thus based on the roadmaps per mechanism for every case (see annex 10 Roadmaps). As can be seen from the table, the first two cases were studied

in full. The six other cases have been studied by looking at key parts of each causal mechanism, as suggested by Beach and Pedersen (2016, 2019).

Table 26: Overview of results per case

+	+/-	-	n/a	X
Present	Moderately present	Not present	Part not found	Part disconfirmed

Full analysis

CASE 1: Permanent absence

	CAUSE	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	OUT-COME
PR	+/-	-	-									-
CD	+/-	+	+/-	+	+/-	+	+	+/-	+/-	+	+	+
PT	+	+/-	+/-	-	-	+/-						+/-
M	+	+	+	+/-	+/-							+/-

CASE 2: Planning

PR	+/-	-	-									-
CD	+/-	+	+/-	+/-	+/-	+	+	+	+/-	+	+	+
PT	+/-	+	+/-	+/-	+	+						+
M	+/-	+	+/-	+	+							+

Key part analysis

Mechanism	Key part	3	4	5	6	7	8
		Interns	Weekend work arrangements	Planning outside working hours	Mobile hoist	Incontinence	Contingency plan
PR	Cause	-	+/-	+/-	-	-	+/-
	Part 1	-	+/-	+/-	-	-	+/-
CD	Cause	+	+	+	+	+	+
	Part 3	+	n/a	-	+	+	+/-
PT	Cause	+/-	+	+	+	+	+
	Part 5	+/-	+/-	X	+	+	+/-
M	Cause	+	+	+	+	+	+
	Part 1	+/-	n/a	-	+	+	+

Inquiry is present, but not systematically nor pro-actively. In the first case we cannot find the mechanism of intuitive pattern recognition, only the cause thereof is moderately present. This means team members engage in inquiry, but not in a systematic way other than their team meetings and conversations with colleagues. The same holds for the second case. The key part analysis shows a lack of the mechanism of intuitive pattern recognition as well. Only case 4, 5 and 8 find a moderate presence of the cause and part 1. This means team members somewhat engage in inquiry, but this is not systematic enough to really record or memorize relevant information concerning signals about emerging systemic failure.

Cognitive dissonance occurs, but often when it's already "too late". In the first two cases the cause of the cognitive dissonance mechanism is moderately present, which means there is some kind of unpleasant feeling about the work-related problem and pressure to reduce this. For the key part analysis, the cause of this mechanism is found in every case. However, the reason for this unpleasant feeling is because something is already going wrong or something has already escalated. If we look at

the second case: issues had been detected by the team members, because mistakes were made in the planning due to communication issues.

Shared perspectives and motivation. Holding a shared perspective (perspective taking) and being committed to the solution (motivation) is hard in the studied cases. We see this in case 3. The difference with a successful outcome is that case 3 lacks preoccupation with failure: team members are not concerned with this problem until it occurs. Case 5 is also an example of a case where the disturbance is detected fairly easily, but there's no shared perspective, neither motivation to solve the issue. The difference here is that an alternative solution has been proposed but was not deemed sufficient by the team members.

Successful problem-solving is having all eyes on the same prize. It is remarkable that team members do not always reach an agreement based on convergent individual perceptions of having a relevant and adequate solution for the problem situation. Only case 2, 6 and 7 succeed in doing so (see part 5 of the perspective taking mechanism). Reaching this agreement makes it much more likely for the team members to commit to the solution. This part is a possible pitfall for successful complex problem-solving as a team. In case 3 the team is not preoccupied with the issue until it occurs, which is why they don't know about current work agreements. In case 4, only part of the team is involved in the case, which is probably why only part of the team will engage in perspective taking and motivation to commit to the solution. Case 8 shows the team doesn't know exactly why, when and how the solution was implemented and what it means. And finally, in case 5 we even see disconfirming evidence for this part: the proposed solution is insufficient and the team leader knows about this, but no action has been taken so far by neither of the parties.

For a detailed analysis per part and whether it is present or not, we refer to the previous chapter and the roadmaps in annex 10.

6.11.2. Socio-technical Design Theory and effective problem-solving: interdependence

Raveendran et al. (2020) discuss different types of interdependence in work environments, namely task (cf. what people do), goal (cf. what people want) and knowledge (cf. what people know) interdependence. Task interdependence is defined as "two tasks are interdependent if the value generated from performing each is different when the other task is performed versus when it is not". Goal interdependence is present when "two agents […] share a common goal, whether or not they actually work together". Knowledge interdependence is the situation in which the value that two agents could generate from combining their knowledge differs from the value they could produce from applying their knowledge separately.

Structuralist theories on organization structure such as Socio-technical Design Theory posit that task interdependency precedes goal and knowledge interdependency. Simply put, knowledge and goal interdependence follow from the grouping of tasks into structural units. The team goal is the combined effort of team members. Knowledge is a requirement to be able to execute a task. These theories downplay the ability of 'agents in the network' or team members to (re)negotiate and alter task interdependencies within the work structure themselves (Raveendran et al., 2020). The focus on task structure is clearly recognizable in the ESF call documents of the IAO-Programme.

In contrast, agent-based theories such as organizational mindfulness posit that formal work structures are dynamic and dependent on whether team members understand them similarly and can agree on them. Goals and knowledge are thus individually held, meaning that understanding how things work or what needs to be done can overlap or diverge. Knowledge extends only job requirements but entails

also skills learnt outside the job, personal preferences, etcetera. This implies that formal structure (cf. designed task interdependence) alone is not enough to produce coordinated behavior, as it is potentially not fully known and/or shared by every team member.

In the next paragraphs we will describe the three types of interdependency in two cases studied. Afterwards we will discuss the implications with regard to STDT and the ESF-call "Anders organiseren".

In case 1 the sequence of different working solutions shows how task interdependence within the team was constantly changing. Interdependence peaked when e.g. team members had to fill in the phone service with half days requiring intensive planning and coordination. Task interdependence with regard to the operation of the service phone was lower when colleagues outside the team or replacements helped out and took over full days of service phone duty (causing less days to be divided between the other team members). In turn, this lowered the need for coordination as the situation was more stable and the share of service phone within the task set of team members was lower. In case 1, goal interdependence clearly preceded task interdependence. The main motivator to deal with the problem was the acknowledgement of the importance of the service phone for the continuity of service delivery and ultimately the clients. It was this acknowledgement of the team goal that created the need for team members to look for new task structures (cf. who does what and when). Under the changing circumstances related to team composition, the team goal remained clear and shared. Meanwhile, the task structure was changing according to the circumstances. Lastly, task interdependencies in the team were and remained underspecified during the whole process. Interviewees reported that the problem-solving process often looked chaotic and improvised. When an issue arose team members were called upon, the situation was discussed in the weekly team meeting and an adequate solution was devised. No fixed procedure or process to manage these kinds of problems were in place. Actions such as a question for temporary help from another team, or an inquiry to hire a new team member were devised on the spot during a team meeting or based on personal initiative by a team member.

Case 2 exemplifies well how knowledge interdependence shapes task interdependence in the team in two ways. First, knowledge interdependence in the team exists through the need to make a team week planning based on client time preferences and team members' week day availability, in order to make sure all clients will be visited. Team members are interdependent on each other's knowledge to make the planning, as knowledge on specific client preferences and individual availabilities reside with individual team members. Based on other team members' information, team members adapt their own individual week planning until they all fit together. This knowledge interdependence was decisive to design a new way of making the week planning, i.e. what the best way is to integrate this individually held knowledge in the most effective way. As in the first case, this resulted in a sequence of different planning schemes. Secondly, the task structure (cf. interdependence) related to the planning changed on the basis of the preferences and ability of team members (not) willing to take up a planning role. Concerning goal interdependence, the strong dedication towards the clients (and frustration due to planning issues causing client complaints) created the need to engage in coordination and change the work structure (and altering task interdependencies within the team). Furthermore, at the time of interviewing, plans were underway in which team members are able to alter work planning themselves during the week, using smart phones. This next step would again alter the more fixed task structure of a weekly centrally organized work planning, making it more decentralized, thus altering further the task interdependencies in the work structure.

These cases exemplify well how task interdependence is dynamic and results from goal and knowledge interdependence within teams. These findings are in line with Raveendran's et al. (2020) argument that states that "task interdependence alone is insufficient to create a design process in which agents actively make sense of the work as they perform it". Important from an intervention perspective

focused on installing effective problem solving, 'manipulating' goal and knowledge interdependence becomes an important focus to include in organizational redesign projects.

However, the consideration where emphasis is to be put rests on the extent in which organizations can afford to design predictable or static work streams in relation to the (un)predictability of the environment (Raveendran et al., 2020). In contexts with predictable work streams, the nature of work is known by managers and it is possible "a priori" to divide work into subtasks and group them into units (organizational design) and assign them to agents (job design). Reward structure (goals) and specialization of agents (knowledge) are then tied intimately to the tasks. However, when work flows become unpredictable with shifting demands and technology enabling flexibility in terms of organizing work, the required task structure will be unknown or it will change too quickly to warrant a detailed design effort based on momentary task interdependence. The consequence of this is that it is not a feasible option to design an entire organization before agents actually conduct the work. Indeed, novel elements arise constantly while work is being performed. Tasks are no longer clearly defined at any given moment in time. This has led to broad job descriptions, containing high-level responsibilities. This also means that agents gain the freedom to follow broader goals and apply their knowledge in ways that reflect their own preferences, rather than predefined requirements. Hence, goal and knowledge interdependencies become salient in their own right for organization and job design, less tightly coupled to task interdependence.

7. Recommendations

7.1. Recommendations for practice

Based on the cross-case conclusions in the previous chapter, we formulate recommendations for practice:

- Inquiry is present, but not systematically nor pro-actively;
- Cognitive dissonance occurs, but often when it's already "too late";
- Shared perspectives and motivation;
- Successful problem-solving is having all eyes on the same prize.

The first two conclusions are based on the lack of intuitive pattern recognition (pro-active recognition of potential work-related problems). We can see that in all cases, problems are observed at some point. This means that team members can pinpoint where things go wrong in the organization and have to act on it, but preventing this from happening is hard. This conclusion is derived from the fact that the mechanism of intuitive pattern recognition could not be fully observed in any case, which means inquiry does not happen systematically on key domains and necessary information is not gathered to be able to prevent failure. Enabling **systematic, pro-active inquiry** within the team is crucial in order to be able to prevent work-related problems from happening.

The lack of this kind of inquiry stems from an **inadequate communication flow**. We see that these teams use a lot of different communication channels: team meetings (formal and informal setting), reports, electronic diary system with notes, e-mail, telephone etc. The risk of missing information is high, because team members lack:

1. **Time** to read through all of these communication means;
2. **Capacity** to remember everything they hear or read.

An option could be to limit the means of communication or to clearly define which tool can be used for which kind of information. Also, it's important to define which information should be shared where: some things can maybe wait until there's a team meeting, other things are urgent and need to be communicated right away. In defining this communication structure, we see a responsibility for the team leader, to enable the communication flow in the best way possible. Also, we see that most of the teams have defined so-called **'star roles'** for certain topics/tasks in the team. This has shown to be a great way to ensure that the information that needs to flow to certain team members (or all team members) gets passed through. We see that specifically in cases 3, 6 and 7. This way of working is more feasible for the team members, because they can be more attentive to information that's associated with their star role. The team leader could be a supporting role in this constellation: not expected to pass through everything but expected to support star roles in making sure the team is aware of the latest information.

If we look at the third and fourth conclusion, a fitting recommendation would be to look at the role of the team leader. The **supporting role of the team leader** can nurture the complex problem-solving capacities of the team. We see in a number of cases (case 3, 5 and 8) that the team leader takes initiative in solving a problem by proposing a solution or making unilateral decisions. The role of the team leader could be to notice frustrations among team members, problems or possible disturbances and to bring the team (or the relevant team members) together to engage more in perspective taking in order to find a solution. In some cases, maybe the team members could have come up with a solution by themselves, but they were steered in a certain direction by the team leader. This could be very positive, because a solution could be reached sooner, but it could also turn negative if the solution is not supported by the whole team. So when the team leader proposes a solution, it is important that this **solution gets support from the team** in order to get accepted. This should be evaluated as well:

if the solution is not supported, the team should engage in a process to see if there's a possibility to improve current work agreements. We conclude from this that evaluating solutions and their support base within the team, is important to enable complex problem-solving within a team.

When we look at the problem-solving process in itself, **functional integration** is an important parameter. As explained before, one of the three structural parameters used in STDT is the division of operational activities (functional integration). This is the extent to which operational activities are divided into sub-activities and are organized into separate units. This means a considerable part of the team is able to operate all direct and indirect tasks. (de Sitter, 1994; Van Laar, Achterberg, Christis, Doorewaard, 2015). Various cases (case 1, 2, 5 and 8) we analyzed showed the importance of **functional integration**: team members being able to replace colleagues and execute other tasks than strictly their own. The more colleagues are able to replace each other, the easier it gets for the team to come up with an alternative planning. This makes the team prepared for unexpected events and able to engage in complex problem-solving. A possible risk could be that team members are not motivated to strengthen functional integration. In a few cases, the team emphasized that they like that certain team members have their tasks. Functional integration could mean they have to learn more and they get even more responsibilities, but it's actually not their job to know about someone else's task. Also, we see that – especially for planning issues – there is a **lack of time** to get used to this new role and do it properly.

Functional integration can grow organically, if the organization actively supports it, based on specific instances of real problems, instead by means of short term sociotechnical intervention. Therefore we would recommend a **gradual approach**. We can see that specifically in the second case: a decision has not been made at once, a gradual process leads up to a joint decision, made by the team members and the team. This change didn't come all of a sudden, instead all team members got the opportunity to try out the tasks in a rotation system. However, after the rotation three members were picked out to fulfill this role permanently, possibly causing the others to lose connection with this task. The reason for this is that certain team members feel more comfortable with the task and are good at it. Finding a balance between functional integration and what the team wants/what they feel comfortable with is important.

Another way to get the team to accept a certain way of working, is **emphasizing the 'why'**: why do we do this, why is it important? This relates to the aspect of 'motivation' or 'work engagement'. Work agreements are made to enable the team to benefit from this, but it's important to show this to the team and motivate them to comply. We can find this in a certain case where work agreements are not followed by certain team members. Nevertheless, these agreements are based on safety measures for all parties (team members and clients). Showing the team, during a team meeting, the importance of the measures and why they could benefit from them, could result in a higher acceptance of a certain way of working. We see this role mainly for the team leader.

Lastly, we recommend a role for the team leader to **create a safe environment** for the team members where they can discuss problems with each other and point out errors. This recommendation is linked to the condition of 'reluctance to simplify'. In some cases team members are scared to hurt their colleagues or to 'betray' them (see case 6 and 7). Pointing out mistakes to each other should feel like helping each other out, to become a better team and provide a better service to the client. Unspoken topics lead to frustration, which leads to a hostile team dynamic. A safe environment and team culture can increase solidarity among team members, which motivates them to find solutions and do that together as a team.

7.2. Recommendations for future research

Not only has this been a valuable study for practice, insights have also been theoretically driven. To capture these insights, we look at process or evaluation use. Evaluation use (or evaluation utilization) refers to the way in which an evaluation and information from that evaluation impacts the program that is being evaluated (Alkin & Taut, 2003). These are important take-aways for future research, as new ESF calls are being written.

Firstly, future ESF-calls about this topic should explicitly focus on both STDT and organizational mindfulness. Referring to the difference between structural and psychological empowerment: not only the fact that a team is given more autonomy is important, but also how the team is able to use this autonomy in the new organization structure (Marichal & Wouters, 2018). Furthermore, it could be worthwhile to repeat this research. If projects would manage to install the relevant conditions, future research could check whether under these conditions the theorized causal mechanisms are actually present.

Future research could focus on the implementation of the projects. This means the way in which the set of conditions that are presumed necessary to enable the causal mechanisms are realized within these organizations (and teams). This research could thus focus on the transformation or organizational change process produced by the ESF-interventions. It could also provide more practical information for organizations to help them bring about the changes that are necessary for adaptive sensemaking.

Apart from these theoretical recommendations, we also formulated a few practical tips and tricks when using Process-Tracing. This document can be found in annex 9.

7.3. Limitations of this research

The data collection in this research is limited. We were able to perform two rounds of interviews: one to explore and select cases and a second one to collect data to perform empirical tests. Due to the pandemic, we weren't able to organize a third round of interviews. This would have been necessary to be able to deliver evidence on the set of conditions that are presumed necessary to enable the causal mechanisms in our theoretical framework. The two organizations we selected for our empirical research are both active in the healthcare sector, which made it impossible and inappropriate to take away valuable time of these organizations and their employees during the Covid-19 pandemic.

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Annex

See separate document.

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