

# Situated co-operative creativity

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A highly important societal aspect of language use are pragmatic creative acts and interactions. The ability to, through multimodal interaction, create something new, is primordial for human sociality. In this paper, I propose a theoretical model that enables detailed analysis of situated co-operative creative actions as these naturally emerge in interactional situations. First, I develop the theoretical model by extrapolating from Charles Goodwin's theory of co-operative action. I then illustrate the model through detailed analysis of a single case where participants interact in a video-mediated robotic context. The model is situated within ethnomethodological multimodal conversation analysis and based on video ethnographic data. This research contributes to the field of creativity and human pragmatic action by providing an applicable model for Situated Co-Operative Creativity, the SCOC model, which can be used for detailed analysis of everyday creativity.

**Keywords:** creativity, situated interaction, EMCA multimodal analysis, Charles Goodwin, computer-mediated, video ethnography

## 1. Introduction

Someone waking is to someone sleeping, as someone seeing is to a sighted person with his eyes closed, as that which has been shaped out of some matter is to the matter from which it has been shaped. (Aristotle 1924, para. 6)

The aim of this paper is to outline elements of a model for the socially organized, co-operative accomplishment of creation in situ by building on and combining different earlier substrates into new phenomena. This process of combining things (words, materials, concepts, etc.) is at its most basic a process of *hylemorphism* in the Aristotelian sense: *hyle* meaning matter and *morphe*, meaning form. For example, letters are the matter of syllables, which are the forms. Or, trees are the matter of a wooden table, which is the form. Matter is what undergoes a change of form. For example, in the case of a bronze statue, bronze is the matter, and this

matter loses one form (*morphe*) and gains a new form, the statue. Bringing something new into being is a creative process, whether what is brought into being is an idea, concept, practice or material. It requires some kind of matter and a process in which the matter is turned into a different form. Obviously, this process can be accomplished through solipsistic and cognitive or distributed cognitive work (Hutchins 2006) where just one person is being creative, e.g. a writer, a painter or a captain on the bridge controlling and interacting with the technology in creative ways. But this paper is only about situations in which human interaction occurs. The aim of the paper is not to provide a model for creativity in general, but specifically to outline a theoretical model for the analysis of social situations where participants engage in ordinary affairs.

The paper is divided into two overall sections. First, I outline the theoretical model. This is based on a review of relevant theories of creativity, then a discussion of an ethnomethodological and Goodwinian approach to social (creative) interaction, which leads to the construction of the SCOC model: Situated Co-Operative Creativity. In the next section I test the model on empirical material. Finally, I draw conclusions about the empirical case, taking into account the kind of findings the model generates, and about the model on a more general level.

## 2. Approaches to creativity

Across the different types of theories and practices, it makes sense to define creativity on the most basic level from its etymology: from Latin *creatus*, past participle of *creare*, which means “to make, bring forth, produce, procreate, beget, cause” or “to bring into being” (OED 2019). This definition resembles the Aristotelian *hylomorphism* by focusing not on process, product or people (Harmsen, Haan, and Swinkels 2018), or any other issues relating to innovation as something novel and value-adding (Schumpeter 1934; Fagerberg, Mowery, and Nelson 2006), but only on creation: bringing forth something that did not exist in *that* form before. This broad definition sees creative actions and interactions as phenomena that happen on a vast scale. This can be studied from a cognitivist and experimental approach (Mumford 2003), as is done when looking at individual capacities (Sawyer 2011), or by looking at relationships between intelligence and ideas (Sternberg 2000) or how associations work (Mednick 1965). It could also be studied from a historiometric perspective, looking at how creative people manage to be creative (Simonton 1999).

However, most of these theories have a very solipsistic view of human action. Group-based theories, by contrast, look at team dynamics, competencies (Frey 2002) and motivation (Amabile 1997), or at group performance (Wittenbaum

et al. 2004) from a functional perspective. And process theories describe in normative ways what participants ought to do (Osborn 1953). Still, although these theories deal with creativity in social contexts, they do not provide an understanding of natural interactions and the contingencies of human action in daily life. Problems arise with approaches that use experimental methodologies which neglect real-world circumstances, have static conceptions of time, and work retrospectively by only looking backwards at the process from e.g. interview material. These kinds of problems are also recognized in the field, as stated by Salas et al. (2009: 69): “We need more ‘anthropological’ studies of team studying, more rigorous qualitative studies, more observational studies, and more studies of teams in context performing in stressful and meaningful environments. So, our view needs to balance its portfolio with methodological studies ‘in the wild’”.

These insights about human behaviour “in the wild” can be provided by turning to theories of the local emergence of creative acts. A dominant approach adopts a sociocultural perspective on creativity (Glăveanu, Gillespie, and Valsiner 2014; Glăveanu, Pedersen, and Wegener 2016; Glăveanu and Tanggaard 2014; Tanggaard 2013a, 2013b, 2014). This theoretical development is primarily concerned with learning contexts, but the basic ideas are generic. Building on theories of intersubjectivity (Mead 1934) and anthropological theories of the creative construction of culture (Wagner 1981), and departing from the pragmatism of Hans Joas (1997), it is argued that it is wrong to assume that human beings first plan their actions in the mental domain and then follow the plan in practice. On the contrary: “actors find themselves confronted with new situations that force them to come up with creative solutions – a process which cannot simply be captured by a functionalist logic” (Joas and Knöbl 2009: 522). Similarly, Tanggaard argues that the concept of “the situation replaces a means-ends logic, for it is in the concrete situation where people take action that perception and cognition take place and where plans are formulated and all of this requires human creativity” (Tanggaard 2014: 109). These kinds of situated approaches challenge rather than reproduce the polarity between novelty and convention (Hallam and Ingold 2008), thereby putting emphasis not on the end product or the value of any creative process, but on the emergence of something new.

Nonetheless, although the sociocultural, situated perspective on creativity provides an ontological base for situated creativity, the related methodological approach to the empirical world lacks sufficient insights into actual details of situations. This also applies to the branch of the situated theories that emphasize emergence and complexity as an ontology, i.e. that ideas emerge out of chaos, and this chaos cannot be described sufficiently (Schuldborg 1999; Stacey 1996). Case studies and interviews are the primary methods used when trying to deal with pathways and emergence, and at the extreme end, there is a denial of the

orderly, observable, recognizable and accountable features of human interaction (Garfinkel 1967, 1991; Garfinkel and Sacks 1970; Sacks 1992).

Contrary to this, I argue that it is necessary to develop a theoretical model that starts from the fact that interactions *are* situatedly emerging and that there *are* orders at all points (Sacks 1992); a model that takes its starting point in the notion of the actor as a location for practices instead of a container for motivations. This is a move away from seeing interactions as a black box towards seeing interactions as orderly and finely organized (Rawls 2008). To really unpack how situations are constituted, accomplished and organized, detailed analysis in the ethnomethodological multimodal conversation analytic (EMCA) tradition, is useful.

### 3. EMCA studies of creativity

The basic idea in EMCA is that interactions are sequentially organized and co-constructed by situated participants through their use of different semiotic resources, and that each action creates the context for the next action (Heritage 1984; Sacks, Schegloff, and Jefferson 1974). Interaction is accomplished on a turn-by-turn basis by situated, reflexive participants who orient themselves to one another's actions (Mondada 2014; Streeck, Goodwin, and LeBaron 2011). Through analysis of participants' actions in sequential environments, it is possible to show how creativity is co-constructed and used as a resource for ongoing activities. A growing body of articles is concerned with ideation, innovation and creative processes in institutional settings from an EMCA perspective, looking at brainstorming as a members' practice (Matthews 2009; Nielsen 2012), imagination in practice (Due 2016; Murphy 2005), collaboration or conflict in practice (Due 2014; Heinemann, Landgrebe, and Matthews 2012) and knowledge use in practice (Landgrebe and Heinemann 2014). These different analyses contribute to a growing foundation of knowledge about the interactional situated details of ideation, creativity and innovation. However, the papers have overwhelmingly dealt with professional contexts in which participants are "supposed" to be creative, for example during brainstorming sessions. And there has been no attempt to construct a more theoretical model. The aim of this paper is to outline such a model that is not only relevant to predefined creative meetings in business contexts but also to everyday, naturally organized and occurring creativity in all sorts of settings.

4. A Goodwinian approach to situated co-operative creativity

The late Charles Goodwin, one of the key figures within EMCA, has consistently, but unsystematically dealt with creativity in his work. In his last paper, he stated: “I think that one of the amazing things about human action is the kind of contingent ways actors can suddenly grab different resources at the moment and pull these resources in to do the things that they want” (Goodwin 2018, para. 4). This is basically hylemorphism in social practice. Most of Goodwin’s work has been concerned with this key observation about how people build action in concert (e.g. Goodwin 2013). In what follows, I will outline elements of a model for situated creativity based on a reading of Goodwin’s book *Co-Operative Action* (2017). This book’s key idea is that people build action in concert by bringing together different resources. To show this, Goodwin initially uses an example that I will revisit (See Figure 1).

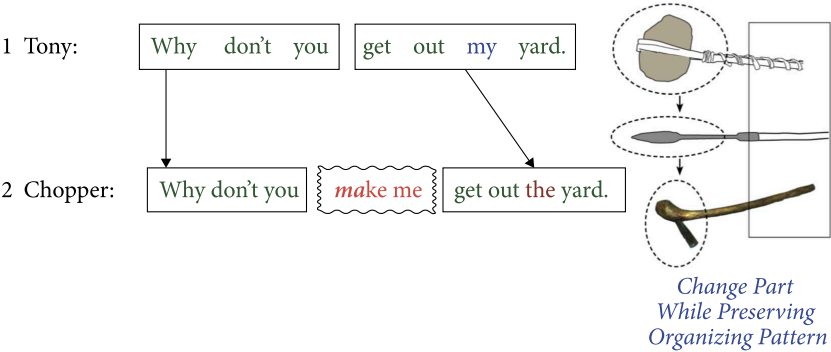


Figure 1. Building new action, Goodwin, 2017, pp.3–5

From the example, Goodwin elaborates that Chopper builds his action in line 2 not from scratch, but instead by performing systematic operations on the materials found in Tony’s action, which constitute a *substrate*. Chopper does this by *decomposing* the combinatorial arrangement in Tony’s action, and then *reusing* these parts, incorporating them as elements of his own utterance while also adding something new. Goodwin then goes on to make a comparison to the transformation or innovation of the axe (see Figure 1), thereby demonstrating how other substrates, from other times and places, may be dragged into the situation. By referring to the invention of the axe, Goodwin makes a link to Aristotelian hylemorphism (although he does not comment on it). However, Goodwin is primarily interested in intersubjectivity, action and the semiotic resources used by participants, and does not specifically discuss creativity.

Although many actions in interactions are basically creative (Joas 1997), not *all* action is creative. Therefore, I will build the model on Goodwin’s terminology, but simultaneously respecify the Goodwinian (Philipsen and Jensen 2018) approach to creativity by highlighting the aspect of *combination* as a key element aligned with the sequential machinery.

5. Developing the Situated Co-Operative Creativity (SCOC) model

Based on Goodwin’s writings and an Aristotelian definition of hylemorphic creation, a model should account for socially situated, sequentially organized actions accomplished in public environments by and through the emerging practices of the participants. It should be able to designate an overall organizing pattern that is decomposed into different substrates. It should be able to show how elements from the substrates are (re)used with transformation as they are combined into something co-operatively new. Further, the model should be dynamic and open-ended in the dialectic sense, as everything always is in process (Deleuze and Guattari 2004; Whitehead 1979). Figure 2 is an attempt to illustrate such a model of Situated Co-Operative Creativity (the SCOC model) in a formalized way. The model has been developed through iterative processes of analysing natural human interactional data. (See Figure 2).

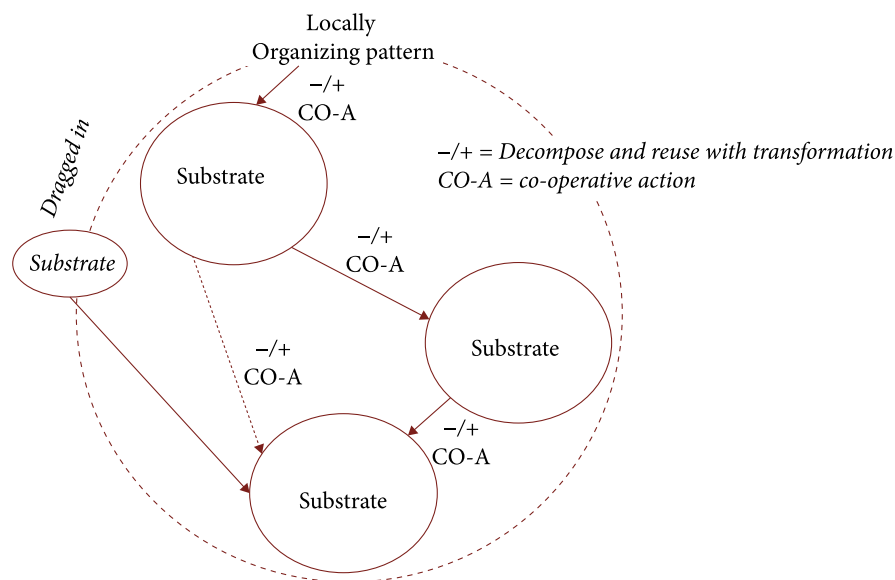


Figure 2. The generic, formalized SCOC model

The SCOC model is based on an overall conceptualization of a current activity as an organizing pattern for subsequent actions (Levinson 1992). Different substrates are produced, reused and transformed through co-operative actions, illustrated with the arrows and the attached minus/plus and CO-A in the model. An activity is always progressing in time within emerging sequential orders, which the different levels of substrate bubbles illustrate. A substrate is by definition a vague category that demarks all kinds of semiosis that can be operated on. As Goodwin (2017, 38) writes, a substrate is “both the sedimented outcome of earlier action, and the source of subsequent action”. Some substrates are produced within the situation and are publicly available (illustrated as those within the circle). Other substrates are dragged into the situation as common, taken-for-granted knowledge, including historically sedimented resources within the environment. Importantly, substrates can be composed of all sorts of multimodal resources, not only language. There can be infinite substrates in an open-ended process. Some substrates link linearly to other substrates in the form of sequential consequentiality, while creativity occurs only when substrates can be combined through reuse and transformation as a co-operative phenomenon; i.e. where different participants operate on each other’s semiosis in bringing forth a new kind of form. It is a process of participants building action by using and transforming the resources that were created in prior actions, either by the participants in the current action, or by predecessors. Situated creativity occurs whenever substrates are combined with transformation into new forms. Let us test the model on a piece of complex natural data.

## 6. Analysis of a single case

The data is from a large-scale project in Denmark focusing on video-mediated interaction. The example is from a healthcare setting in which three healthcare workers are physically present with a patient who has a leg wound that the doctor needs to inspect. However, the doctor is only virtually present through a telepresence robot. He is sitting in his office 50 miles away and remotely controlling the telepresence robot in the nursing home. The robot has wheels and a screen, so that the doctor can maneuver it, see and be seen. However, in this example, the participants encounter problems with light and issues of visual access to the wound; these problems they creatively solve in situ through co-operative actions. The example is transcribed using Jeffersonian (2004) standards. All participants signed confidentiality agreement and have been anonymized. The doctor is transcribed as DOC, when he speaks and as RoboDoc for physical actions using the robot. Health care workers are transcribed as HCW1–3. The angle of the record-

ing is from the view of the telepresence robot (a mounted camera on top of the screen). The example has been cut into three excerpts following the sequence in time, focusing on (1) adjusting the spatial position and anticipating future problems, (2) configuring the physical setting, and (3) providing novel solutions to problems of visual access.

Overall, this example shows a locally organizing pattern related to achieving visual access to a wound on the patient. A variety of actions composed into substrates are produced emergingly to solve the issues with perception. Let us first unpack the sequential organization and semiotic resources involved in this excerpt, and then proceed to look for a more theoretical understanding on the level of the creativity model.

### Excerpt 1. Adjusting spatial position and anticipating future problems

01 DOC: =må je' kan jeg kun se det omme fra den anden side!#  
 Fig #fig1  
 (HCW1+2 looks up at RoboDoc)  
 =may I' can I only see it from the other side!  
 02 HCW2: [JA]  
 [YES]  
 03 HCW1: [ja::]: skal vi så trække ned# og se om det hjælper  
 [ye::]:s should we pull down the blind and see if that helps  
 Fig #fig2  
 (HCW2 starts moving away from the bed/HCW3 moves to window)  
 04 DOC: ja så må i lige trække l ned=  
 yes you'll have to pull it l down=  
 05 HCW2: ja  
 yes  
 06 DOC: [\*>så kommer jeg<\*]  
 [\*>I'm coming<\* ]  
 07 HCW1: [fordi ]de::t hvert fald (.) bedst at se# heromme fra  
 [because ]in any case it's (.) best to look from back here  
 Fig #fig3



Figure 1



Figure 2

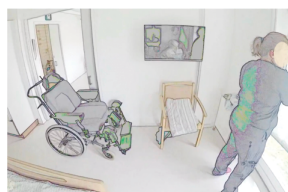


Figure 3

The excerpt begins when the Doc says that there is a problem getting visual access to the wound. He can “only see it from the other side” (l. 1). The telepresence RoboDoc is currently positioned on the left side of the bed, with the window behind it. The wound is on the patient’s left leg, furthest away from RoboDoc, so the statement implies that he needs to move into a better position for visual access. HCW2 aligns with a prompt high-volume YES, produced in overlap with HCW1, who also aligns and then expands her turn by attaching a question: “should we pull down the blind and see if that helps” (l. 3). Interestingly, already in the pursuit of solving one problem with visual access due to the spatial positioning, HCW anticipates future problems with visual access to the wound – presumably



related to glare from the windows. This initial problem identification and suggestion for a future action that can solve the problem may be conceptualized as *substrate1*: a local, public configuration of actions that can be operated on. *Substrate1* is a constitutive part of the organizing pattern but also decomposed from it and subsequently reused and transformed as HCW<sub>3</sub> operates on the substrate and rolls down the blind (Figure 3). In overlap with the proposal, before HCW<sub>1</sub> ends the turn, HCW<sub>3</sub> starts moving toward the window, thereby bodily responding to HCW<sub>1</sub>'s question with a confirming action. Thus, we notice that *Substrate1* is already operated on in the pursuit of solving the emerging problem.

The verbal second pair part to the question is then produced by Doc: "yes you'll have to pull it down" (l. 4). This produces the conditionally relevant next action in the sequential organization, while at the same time displaying the deontic identity-related stance: to be the person in the room who can authorize actions (cf. Due and Trærup 2018). While RoboDoc drives around the bed, HCW<sub>3</sub> rolls the blind down. Knowledge and practical experience of issues of visual access due to glare from the windows are observably oriented to in the interaction as it unfolds – and before the actual problem of low vision quality is reportedly experienced in situ. Hence, not only knowledge of how to use the sedimented structure and provide shade, but also contextually placed practical experience with these kinds of issues from prior situations are observable and made accountable through the public actions, and may thus compose another dragged-in *substrate2*. A *substrate2* that is built to operate on the previous *substrate1* (problem identification) and itself constitutes a *substrate2* that can be operated on through reuse and transformative local actions.

## Excerpt 2. Configuring the physical setting

(8.0) (RoboDoc drives around the bed. HCW<sub>3</sub> rolls the blind down)

08 HCW<sub>1</sub>: 'hvis nu at øhhh# vi lige prøver at 'holde  
'now if ummm we just try to 'hold  
fig. #fig4  
(RoboDoc drives around bed/HCW<sub>2</sub> moves backwards)

09 HCW<sub>1</sub>: så ser jeg om jeg kan få 1lys  
then I'll see if I can get some light

10 HCW<sub>3</sub>: holde(PAT name)s ben  
hold (PAT name)'s legs

11 HCW<sub>1</sub>: og hvor er det så henne igen=  
and where is it again=

12 HCW<sub>3</sub>: =fder#=  
=tthere=  
fig #fig5  
(RoboDoc approaches patient)

While RoboDoc continues to drive around the bed to get into position, HCW<sub>1</sub> and 2 collaborate to achieve a spatial and material arrangement suitable for the RoboDoc's visual inspection. Bear in mind that the Doc, though in a sense present in the room, is *not* a human being. He is not able, by himself, to adjust his body or use any bodily flexible parts (e.g. bending, turning head, using arms and hands).

This contextual configuration serves as a key element in the organizing pattern, as the RoboDoc needs to move according to the telepresence's technical affordances.

The long verbal pause at 8 seconds (l. 7–8) is not actionless but semiotically rich, as HCW3 rolls down the blind, the RoboDoc drives, and HCW1 and 2 closely monitor RoboDoc's movements while stepping aside (Figure 4). However, getting into a relevant position for clear visual access to the wound is not only achieved tacitly and bodily. HCW1 and HCW3 verbally collaborate and account for their actions, as they organize the spatial setup suitable for the RoboDoc: in lines 8–9 HCW1 orients to adjusting the patient's leg while making additional light a relevant concern. In line 10 HCW3 completes HCW1's incomplete turn (l. 8), and then collaborates on identifying where the wound is (l. 11–12, pointing at the wound in Figure 5). This bodily management of the patient and the spatial positioning in conjunction with the verbal accounts constitute another *substrate*<sub>3</sub>, which is a sign complex and hence a possible focus of transformative operations by another actor.

Before continuing the analysis, let's sum up:

*Substrate1*: the participants have oriented to problems of visual access due to spatial positioning and RoboDoc has moved. *Substrate2*: they have oriented to problems of glare and rolled down the blind. *Substrate3*: they have oriented to problems of visual access to the wound on the patient, the healthcare workers have positioned the patient's leg so that the wound is visible, and they have stepped aside to make room for the RoboDoc. Each substrate has been composed of different semiotic resources and undergone reuse and transformation as the sequence has progressed. In the last part of the example we will see how a novel solution that builds on these substrates emerges.

### Excerpt 3. Providing novel solutions to problem

13 HCW1: =\*(det)rigtig d rligt'  
 =\*(that's)really bad'  
 14 DOC: ja i ska- lde::t i skal lige lave lidt skygge# deromme  
 yes you hav- li::t you have to get some shade back there  
 fig #fig6  
 (HCW1 looks at RoboDoc)

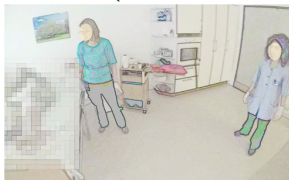


Figure 4

15 HCW2: ↑JA  
↑YES



Figure 5



Figure 6

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16 HCW1:  lidt ↑skygge#
           some ↑shade
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fig                                     #fig7
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(HCW1 and HCW3 move around bed/HCW2 raises bed w/ controller)  
(2.9)

17 HCW1: #er [(det ikke for meget) med lyset]  
is [(it not too bright) with the light]  
fig #fig8  
(HCW1 looks up and raises arms/HCW3 takes blanket)  
18 HCW3: [(hvor meget vil i op)]#  
[(how far up do you want it)]  
fig #fig9  
(HCW3 holds up blanket)  
19 HCW1: [hjælper det overhovedet]  
[does it help at all]



Figure 7

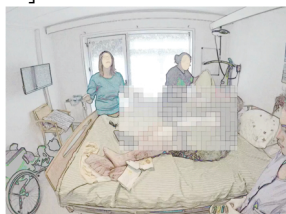


Figure 8

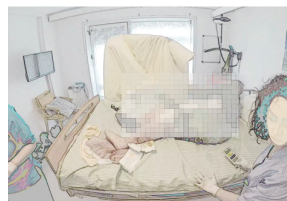


Figure 9

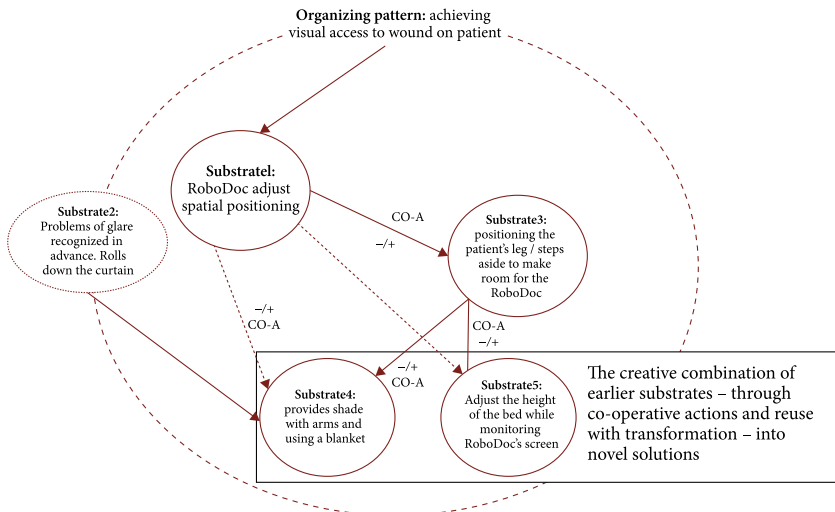
There have been substantial changes in the contextual configuration (Goodwin 2000) in the pursuit of achieving appropriate visual access. Then HCW1 reports that it is “really bad” (l. 13). Doc responds with a confirming “yes” and then with a solution: “you have to get some shade back there” (l. 14). Although the participants have oriented to problems of low-quality perception and co-operated on each other’s substrate to produce a solution (moving around bed / rolling down the blind), the problem is still not satisfactorily solved.

Using the word “shade” is a more direct way of addressing the issue of glare from the window, and the wording is reproduced by HCW1 (l. 16). HCW1 and HCW3 consequently move around the bed while HCW2 grabs the controller to the bed and starts raising it while monitoring the doctor’s view, shown on the telepresence robot’s screen. HCW1 verbally accounts for another problem source, the possible glare from the ceiling light. While saying “too bright with the light” (l. 17) she looks up and raises her arms (Figure 8) and HCW3 simultaneously moves towards a blanket, which she grabs and then holds up as a means of shading the light from the window (Figure 9).

While doing these embodied actions aimed at providing a shadowing solution to the problem of glare, HCW2 follows another path and moves the bed up so that it is more aligned with the nonadjustable screen height on the telepresence robot. Both these solutions can be seen as separate *substrates*<sup>4&5</sup>, which reuse and transform resources provided earlier in order to produce novel solutions to the emerging problem of visual access. The substrates are both the sedimented outcomes of earlier actions and the possible sources for subsequent accumulative transformations. They are the productions made possible by co-operative action where participants display orientation to each other’s actions and consequently respond in the sequential unfolding of the event.

## 7. Discussing the analysis in light of the SCOC model

This detailed analysis has unpacked the sequential organization and semiotic resources involved in the production of the organizing pattern of achieving visual access to the wound on the patient. The analysis highlighted how chunks of actions and multimodal resources may be interpretable as substrates, which are both productions of earlier actions and sources for subsequent action. In each case small changes involving reuse and transformation were observed going from one substrate to the next – not as isolated events but as co-operatively accomplished, as participants built and operated on actions to produce new substrates. The formalized SCOC model with Goodwinian terminology was used in the analysis. Figure 3 illustrates the example as a case of situated co-operative creativity.



**Figure 3.** A contextualized version of the SCOC model

Whereas each transformation that builds on former substrates may be interpretable as creative in the broader sense, substrates 4 and 5 are more clearly seen as creative because they are composed through a combination of earlier substrates, reused and transformed. The production of substrate4, the novel action of grabbing the blanket and using it for shadowing, in combination with substrate5, raising the bed, is built on prior substrates used in combination as particular elements of them are reused and transformed. From substrate1, as RoboDoc changes spatial position he displays orientation to issues of perception. From substrate2, the problem of glare is recognized in advance and the blind is rolled down. From substrate3, positioning the patient's leg and stepping aside to make room for the

RoboDoc display attentiveness to the fact that the present doctor, being a robot, has very restricted embodied possibilities for manipulating the environment in order to establish a relevant context for examination.

If we identify grabbing the blanket and using it to create shadow as a creative pragmatic act, it must be understood as the combination of prior elements from the substrates, reused and transformed: combining shared orientation to issues of perception, of glare and the robot's restricted mobility in order to produce a novel solution. So, the three healthcare workers co-operate in ordinary, creative ways to achieve a setting that makes it possible for the doctor to perform the visual examination. The situated problem identification is recognizable and made accountable both through linguistic resources and embodied orientations, and participants can be seen to organize a pattern around the problem and its possible solutions. The SCOC model has been developed to shed light on this interactional process.

## 8. Conclusion: Potentials and problems regarding the SCOC model

This paper has sought to outline a model for the interpretation of everyday situated co-operative creativity. Just what counts as being creative must be kept unspecified a priori and instead be shown to be observable and accountable in situ. However, creativity is also an abstract category that participants do not necessarily explicitly orient themselves to, producing evaluations such as: "wow, that was creative". Creative action should not be defined as either only reported or evaluated as such in situ, but also as an abstract category that is useful for the analyst in interpreting everyday situations.

Creative actions are not just abstract theorizing but situated accomplishments in and through human interaction. Theories of situated creativity (Tinggaard 2014), cultural theories (Hallam and Ingold 2008) and theories of complexity (Stacey 1996) recognize this, but leave out sufficient descriptions of the exact orderly organization and semiotic resources involved in this accomplishment. The *thisness* (*haecceity*; Garfinkel 1996; Merleau-Ponty 2002) of just this particular orderly organization must not just be stipulated, but shown to be a moment-by-moment accomplishment by locally situated participants. The SCOC model can be a tool in this process.

A key insight in the present paper is that substrates are not just operated on in a straightforward linear way but through combinational processes. This paper has highlighted the combinational aspect of creativity by showing how it works in social interaction, *not* as a clear-cut, verbalized, oriented-to process (e.g. "then I take this element and combine it with this..."), but as an intertwined complex semiosis naturally unfolding in messy social situations. The participants in

the case study were seen, not just to build on one particular earlier substrate, like pearls on a string, but to combine elements from different substrates that were then reused and transformed into something new, and perhaps, in creativity terms, novel solutions.

So, in the example, the solution of grabbing the blanket and using it to create a shadow is not an isolated action but rather accomplished by combining transformed elements from substrates 1–3. Time passes and actions are produced in sequences that determine a forward-flow which cannot be reversed. In that sense each action is always contingent on prior actions, as context-shaped and context-renewing (Heritage 1984). However, participants can easily jump in time and use elements not just from substrates produced in the previous sequential position, but also previous substrates from the same situation and from other situations as sedimented and shared indexical knowledge, dragged in, reused and transformed for the production of new action by combining just this element from just this substrate with just this other element from just that substrate, etc.

Combination as a key element in creativity, however, is not a new insight. The work of Koestler in particular points to combination as the common pattern underlying all creative activity (Koestler 1964, 1981). He uses the term *bisociation*, which highlights the blending of elements drawn from two or more previously incompatible frames of thought, what he calls matrices, into a new matrix of meaning. He argues for instance, that novel scientific work is creative because two or more matrices are fused into a new, larger synthesis. However, Koestler's position is purely cognitivist and focused on the process of mental comparison, abstraction and categorization, analogies and metaphors. The theory of *conceptual blending* (Fauconnier and Turner 2002, 2003; Turner 2006) owes a great deal to Koestler's work, and can be seen as an updated version of Koestler's more philosophical ideas, though, again, on a very cognitive level.

Nevertheless, the fundamental idea of combination as a key element in creativity is similar to what has been shown to be the case for social interaction in this paper. The paper started by going back to the Aristotelian description of *hylomorphism*, which is the emergence of form from *hyle*. Bringing something new into being requires some kind of matter and a process in which it is given a different form, typically through a process of combination. However, this paper has sought to show – and propose a model for – how combinations are not only cognitive operations but socially available based on public substrates. Hougaard (2005) and Hutchins (2005) have previously applied conceptual blending in an interactional context, but their goal was also to contribute to cognitive theory. In this paper, I have instead tried to outline an open-ended model about how members' actual, ordinary activities consist of methods to carry out practical actions that are not just mental operations or sequences of actions, but also creative combina-

tional operations embedded in common-sense knowledge, understandable “‘from within’ actual settings, as ongoing accomplishments of those settings” (Garfinkel 1967: vii–viii).

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