

# Joint Action – Some Problems for the Minimal Architecture Model

## Minimal Architecture Model

Vesper, Butterfill, Knoblich, and Sebanz (2010) introduce a minimal architecture of joint action. The model, which can be found in the middle of this poster, consists of several building blocks, or modules, that together make joint action possible. Not every building block is needed for every joint action.

Vesper et al. propose three differences between individual and joint action.

1. We have to **predict** the behavior of the other,
2. We need to **adjust** our behavior to the behavior of the other, and
3. There has to be (precise) spatio-temporal **coordination**.

The building blocks that make joint action possible are:

- **Representation**; we can represent a) the goal, b) our own task, and c) task x (the task of the other, not necessarily the other agent).
- **Monitoring**; are the goal and task(s) unfolding as expected?
- **Prediction** of the unfolding; needed in order to monitor.
- To further facilitate joint action a **coordination smoother** is added to the model (such as modifying our own behavior, or using specific objects to simplify coordination).

Not all building blocks have to be used in order to speak of joint action.

## Connecting Models in Joint Agency

The Minimal Architecture recognizes the importance of direct action-perception links and language based planning theories. It is argued to fill the gap between these two kinds of theory. However, it does not say much about how these theories are related. This is how the Minimal Architecture positions itself:

- A. Planning theories
- B. **Minimal Architecture** (Joint Action)
- C. Direct Action-Perception Links

Tollefsen & Dale (2012) say A and B are intricately interconnected through deep commitment and surface synchrony. (see upper right box.)

Abramova & Slors (2015) use direct perception of affordances to link B and C. This idea is partly based on the idea of alignment by Tollefsen, Dale & Paxton (2013). (see lower right box.)

## Some Problems with the Model

Simply adding another theory or model to the existing dozens of models we have is insufficient, especially if we do not explicate how these models can function together.

Tollefsen and Dale (2012) argue that the degrees of freedom (in the joint action, Turvey 1990) are partly reduced by the other agent: the other becomes part of the context in which action constraints and conditions take shape.

Tightly connected to this idea is the notion of alignment. Alignment constrains behavior. Tollefsen and Dale argue that alignment is needed to understand how we can do things together, both at a planning level and at a level of acting (spontaneously). In the box on affordances (see below) I use this idea of alignment in an attempt to understand how we can connect the different models through a better understanding of coordination facilitation.

## Facilitating Jointness – Two Worries

Both in planning theories and in the minimal architecture a kind of “background” (the coordination smoother in the minimal architecture model) is introduced to facilitate acting together. How does a background function?

Two general worries that apply to both the minimal architecture model and planning theories of joint action.

- Should we really understand “background” as **one single building block**, given its descriptions of it in most theories? It rather seems as if many different mechanisms are at work. Using signals, for example, seems to rely on a linguistic interpretation of the other.
- There is a certain **vagueness** to the background. Most theories only describe its function, but do not explain how the function works. Affordances might provide an understanding of this function.

See these boxes for further clarification and the box on affordances as a new way to understand facilitation.

## Coordination Smoother as Facilitator

Vesper et al. describe one piece of evidence for the “coordination smoother”; we are better cooperators under decreased variability.

They further point to ways in which coordination can be facilitated, such as trying to interfere less with the other agent, using coordination signals, and synchronizing movements.

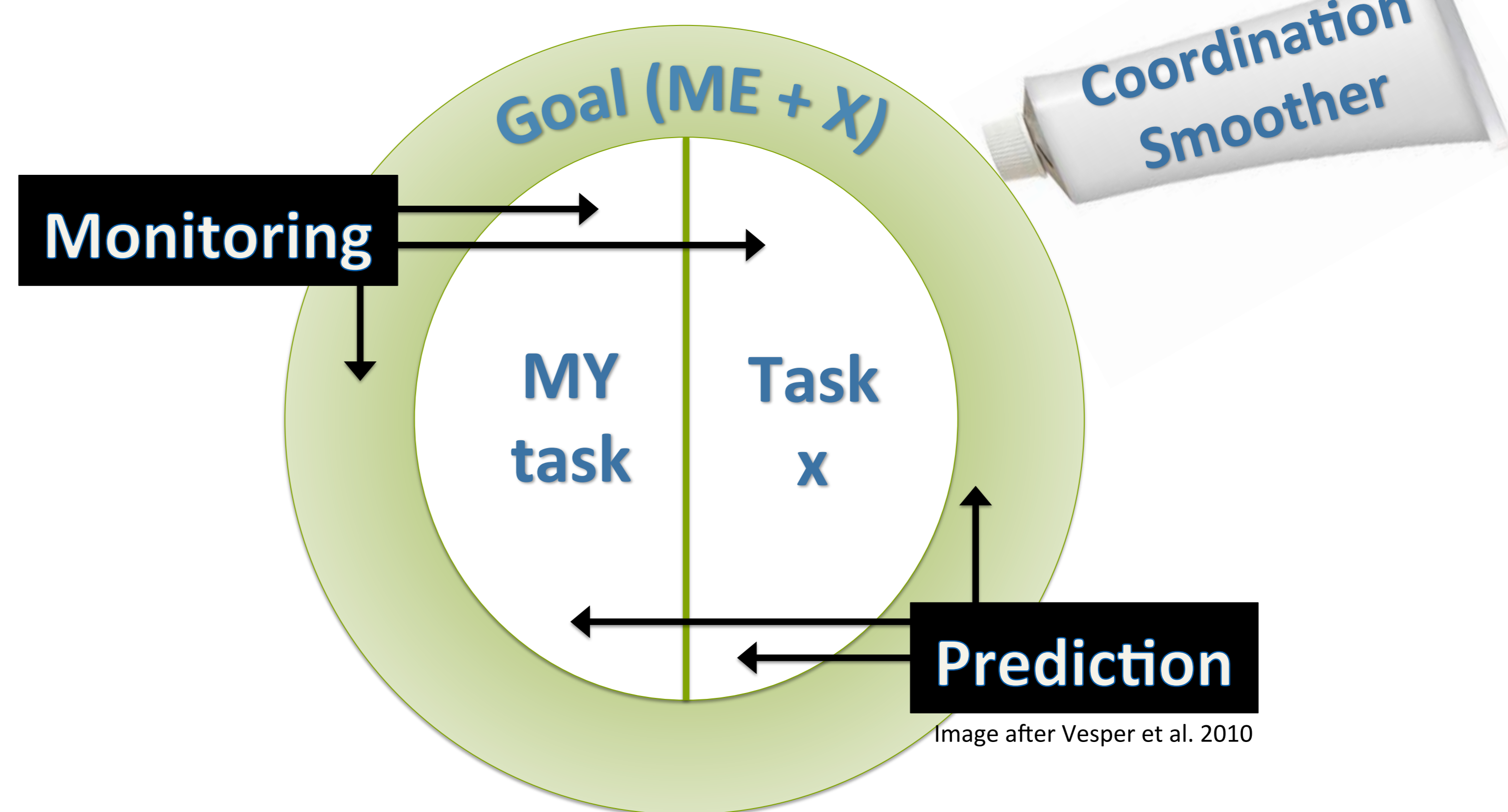
## Further Questions

Can the Minimal Architecture account for both contributive and distributive action coordination?

Can the Minimal Architecture account for the difference between other agents that are inside or outside the personal space?

Can affordances connect the different theories on joint action?

Are affordances sufficient to function as the coordination smoother, background, or common knowledge?



## Facilitation in Planning Theories

The **Background** consists roughly “of the set of capacities, dispositions, tendencies, practices, and so on that enable the intentionality to function” (Searle 2010:155), a set of non-representational capacities (Searle 1983). Searle distinguishes between deep background (biological make up), such as walking, grasping, perceiving, and a pre-intentional stance (the solidity of things) and a local background which is cultural, social, and also pre-intentional. He calls this background our embeddedness, but how this influences our acting is not explained.

Bratman assumes an interdependence in shared intentionality that seems to suggest that I cannot form my intention “that we J” until you do, and vice versa. Elements in a common environment provide structures to get started together. The assumption that the other intends ‘the same’ is grounded in **common knowledge** of social environments (Bratman 2014). Bratman does “not try here to say what common knowledge is. But it may be that it involves some external situation in the environment of the agents that functions as what Lewis calls a ‘basis for common knowledge’.” (1999:111 f8)

## Affordances: a Solution?

Tollefsen, Dale & Paxton (2012) argue for the importance of alignment. Their idea is that the degrees of freedom are reduced through self-organizing dynamical systems, which organize (e.g.) muscle groups into coherent, functional units. The other is part of the context that reduces the degrees of freedom in both individual and joint action. Abramova and Slors (2015) further use this idea and couple it to direct social perception and affordances. They try to conceive of the social cognitive processes in perceptual (rather than inferential) terms to get out of the recursive loop that is implied in the idea that joint agency is always built on a shared action plan.

Affordances are action possibilities offered by the environment. These possibilities are determined by features of the environment and features of the organism (Chemero 2003). Rietveld and Kiverstein (2014) distinguish between the landscape and field of affordances. A field is a situation specific set of the landscape. Abramova and Slors argue that the other can be part of this field and can change the landscape as time evolves. The other therewith influences my action possibilities directly. We need not always represent the other, but we sometimes do.

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