Sculpting the space of actions: explaining human action by integrating intentions and mechanisms
Keestra, M.

Citation for published version (APA):

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: http://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (http://dare.uva.nl)
Figures

Figure I. Representation of an explanatory mechanism responsible for Φ-ing and some of its possible modifications, as discussed in Part I. Page 371-372.

Figure II. Representation of an explanatory mechanism involved in development or learning as accounted for by neuroconstructivist theories, as discussed in Part II. Page 373-374.

Figure III. Representation of explanatory mechanisms responsible for Φ-ing in a novice and an expert in a particular situation with their distinct sculpted spaces of actions, as discussed in Part III. Page 375-376.
First level of decomposition: task $\Phi$-ing decomposed in component parts and operations

Second level of decomposition: component $\gamma$-ing further decomposed in components

Figure I. Representation of an explanatory mechanism responsible for $\Phi$-ing and some of its possible modifications, as discussed in Part I.

Simplified representations of the explanatory mechanism responsible for the task - or explanandum phenomenon - $\Phi$-ing at two different moments in time, $t_1$ and $t_2$. Between those moments several kinds of mechanism modification have occurred at different levels, as was discussed in chapter I.5. Mechanism modifications represented here are: increased (bold) and decreased (striped) interactions between components; a new feedback relation (yellow) between $\gamma'$ and $\gamma$; new influence (blue) of component $\gamma'$ on component $\gamma$; new interaction (blue) between $\Psi$-ing and $\Phi$-ing, yielding an - indirect - influence of new input to $\Phi$-ing. These mechanism modifications are together responsible for modifications of the cognitive and behavioral outputs of $\Phi$-ing. Note that vertical red dotted lines represent constitutive relations between mechanism levels and that green dotted circles represent the context within which components figure.
Figure II. Representation of an explanatory mechanism involved in development or learning as accounted for by neuroconstructivist theories, as discussed in Part II.

Simplified representations of the explanatory mechanism responsible for the task Φ-ing, in this case: singing. According to the neuroconstructivist theories of development and learning discussed in chapter II.2, two (partly overlapping) phases of learning can be distinguished. Mechanism modifications are involved in this (see figure I). The first phase of proceduralization is characterized by improved performance of Φ-ing, enabled by the modularization (blue circle) of some mechanism (sub-)components which enables their faster and stable processing, enabling increased (bold) and decreased (dotted) interactions between components at another level. This also facilitates additional interaction (blue) between tasks Φ-ing and Ψ-ing (e.g. acting). The second phase of explicitation is then characterized by increasing explicit control of Φ-ing, again facilitated by additional interactions (blue) between tasks. Due to representational redescriptions, multiple representations involved in the task (curved dotted arrows) are available to the agent, leading from an implicit and simple representation to more complex, hierarchically structured and explicit representations of the music piece. Note that vertical red dotted lines represent constitutive relations between mechanism levels and that green dotted circles represent the context within which components figure.
Figure III. Representation of explanatory mechanisms responsible for \( \Phi \)-ing in a novice and an expert in a particular situation with their distinct sculpted spaces of actions, as discussed in Part III.

Simplified representation of the explanatory mechanisms responsible for the task - or explanandum phenomenon - \( \Phi \)-ing in a novice and an expert respectively, in this case the task of determining an action in a particular situation, as was discussed in chapter III.4. With his increased expertise, the expert’s responsible mechanism has become modified (see figures II and III). Corresponding with that process, the space of actions from which an action will now be determined by the interacting (sub-)components of \( \Phi \)-ing has become sculpted in the expert, which is not the case for the novice’s space of actions. Red dots represent preferred action options that maximally comply with his motor expertise (vertical axe), with his distal intentions (horizontal axe) and with the situational conditions (diagonal axe). Green dots represent suppressed action options that comply only minimally. Blue dots refer to action actions that are neither preferred nor suppressed. The novice’s space of actions contains only a few of those blue dots. Note that vertical red dotted lines represent constitutive relations between mechanism levels and that green dotted circles represent the context within which components figure.