ENACTIVE ANALYSIS OF CLIMBERS' ACTIVITY IN LEARNING SITUATIONS

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Abstract

The aim of this study was to characterize the role of experience in the learning process of beginner climbers. Using an enactive approach of climbers' activity, we focused our analysis on their experiences while previewing and climbing different routes during a learning protocol. The data collection consisted of a 13-session protocol (including pre-, post- and retention tests) in which climbers performed nine climbs per session. Each trial was video recorded and the video recordings were used to collect climbers' experience using self-confrontation interviews, which were carried out immediately after each session. The in-depth analyses of climbers' experiences identified phenomenological clusters (i.e., categories of experience), which temporal emergence highlighted meaningful sequences and characterized the climber's own worlds. These results suggested that climbers are sensitive to functional features of the environment, such as the layout of the holds, in which they perceive opportunities for actions (i.e., affordances), thus shaping their activity. Considerations about the transformative effects of the interviews on activity and learning are addressed. Also, the perspective of an articulation of data of experience with behavioral data is mentioned.

Keywords: Climbing, Learning, Enaction, Phenomenology

Résumé

Cette étude visait à caractériser le rôle de l'expérience dans le processus d'apprentissage en escalade chez des grimpeurs débutants. Utilisant une approche énactive de l'activité des grimpeurs, nous avons centré notre analyse sur leurs expériences lors de la visualisation et l'escalade de différentes voies durant un protocole d'apprentissage. La collecte des données consistait en un protocole de 13 séances (incluant pré-test, post-test et test de rétention) durant lequel les grimpeurs ont réalisé neuf ascensions par séance. Chaque essai a été filmé et la vidéo a été utilisée pour collecter l'expérience des grimpeurs lors d'entretiens d'auto-confrontation, qui ont été menés immédiatement après chaque séance. Les analyses approfondies des expériences des grimpeurs ont identifié des clusters phénoménologiques (i.e., des catégories d'expérience), dont l'émergence temporelle a mis en lumière des séquences significatives et ont caractérisé les mondes propres des grimpeurs. Ces résultats suggèrent que les grimpeurs sont sensibles à des caractéristiques fonctionnelles de l'environnement, telles que l'agencement spatial des prises, dans lesquelles ils perçoivent des opportunités d'actions (i.e., affordances) façonnant ainsi leur activité. Des considérations sur les effets transformatifs des entretiens sur l'activité et l'apprentissage sont adressées. Egalement, la perspective d'une articulation des données d'expérience avec des données comportementales est évoquée.

Mots clés : Escalade, Apprentissage, Enaction, Phénoménologie

Introduction

The aim of this study was to characterize the role of experience in the dynamics of learning in climbing. To do so, we sought to track changes over time in a holistic manner by analyzing climbers' activity in ecological settings. The term "activity" refers to the entangled processes that are part of human behavior, that is, actions and cognitions emerging from the interactions between the climber and the environment (e.g., the layout of the climbing holds on the wall). Specifically this study focused on the pre-reflective part of activity (i.e., the climbers' experiences) in order to understand how climbers bring forth a world in which they act, explore and learn between attempts, and between sessions. To conduct such investigations, we root this work in the enactive paradigm (Varela. Thompson & Rosch, 1991) considering the following core-ideas: (1) activity is fundamentally embedded in the environment, (2) activity emerges from a structural coupling with the environment instead of being prescribed by any mental representation, (3) activity is embodied (i.e., the bodily dimensions are key components of perceptions, actions, and cognition); (4) the structural coupling with the environment is regulated by a sense-making process, which means that the agent generates meaning (Di Paolo, Rohde, & De Jaegher, 2011); (5) a part of the activity raises experience, which phenomenologically reveals the meaningful embodied and situated elements that make up agents' enacted worlds. In climbing, the enactive approach has already provided valuable insights into the understanding of ice climbers' experiences (e.g., Adé, Seifert, Gal-Petitfaux, & Poizat, 2017; Seifert et al., 2014); this perspective is therefore relevant to (1) characterize climbers' enacted worlds in learning situations and (2) study the dynamics of the learning processes as meaningfully experienced by the climbers.

Methods

Four novice climbers volunteered to participate in the study. They followed a leaning protocol, which was composed of 13 climbing sessions: a pretest, 10 practice sessions (2 sessions per week), a post-test and a retention test five weeks after the post-test. During the practice sessions, participants climbed three different routes: a control route and two other routes, which changed every two sessions. Participants performed three trials on each route per session and were prompted to climb the route as fluently as possible, avoiding stops and saccades. Before each trial, participants had 30 seconds to preview the climbing route. Each climbing trial (including the preview) was filmed. Immediately after each practice session, climbers did an 1-hour self-confrontation interview using the video recordings. The aim of the self-confrontation interview was to restore climbers' stream of experience while previewing and climbing the routes, following the chronology of the events. To do so, the researchers used verbal prompts to document specific components of activity, such as: "What are you doing at this moment?" (actions undertaken by the climber); "What do you perceive? What draws your attention?" (focalisations), "What are you trying to do?" (concerns and involvement in the situation). Generalizations, and retrospective interpretations were avoided. The data treatment consisted of a characterization of phenomenological clusters emerging from climbers' experiences while previewing and climbing the route. Three typical phenomenological clusters, which were labeled as follows: concerns, focalisations and actions were documented by an in-depth analysis of climbers' courses of experiences. To restore their temporal dynamics, their chronology of emergence was also respected.
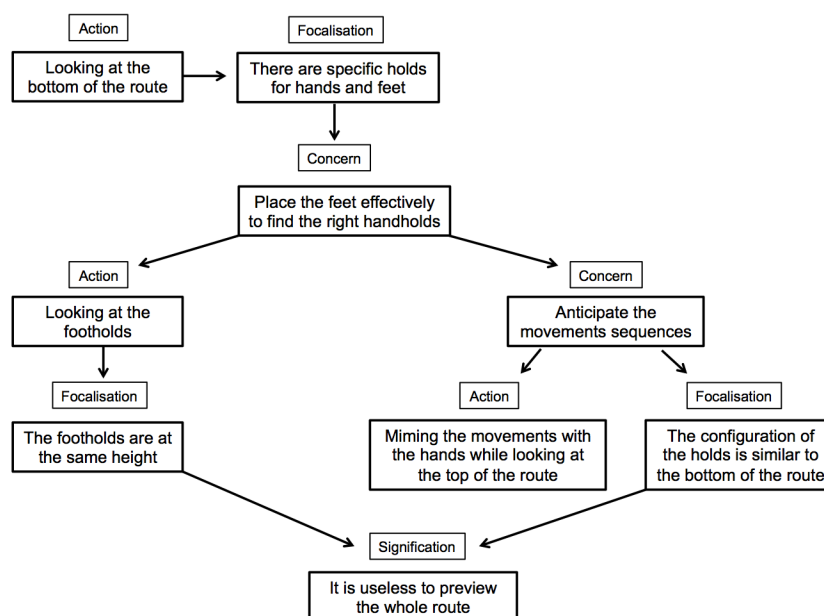
Results

Figure 1. Succession of a climber's phenomenological clusters during the preview of a route during the pre-test.
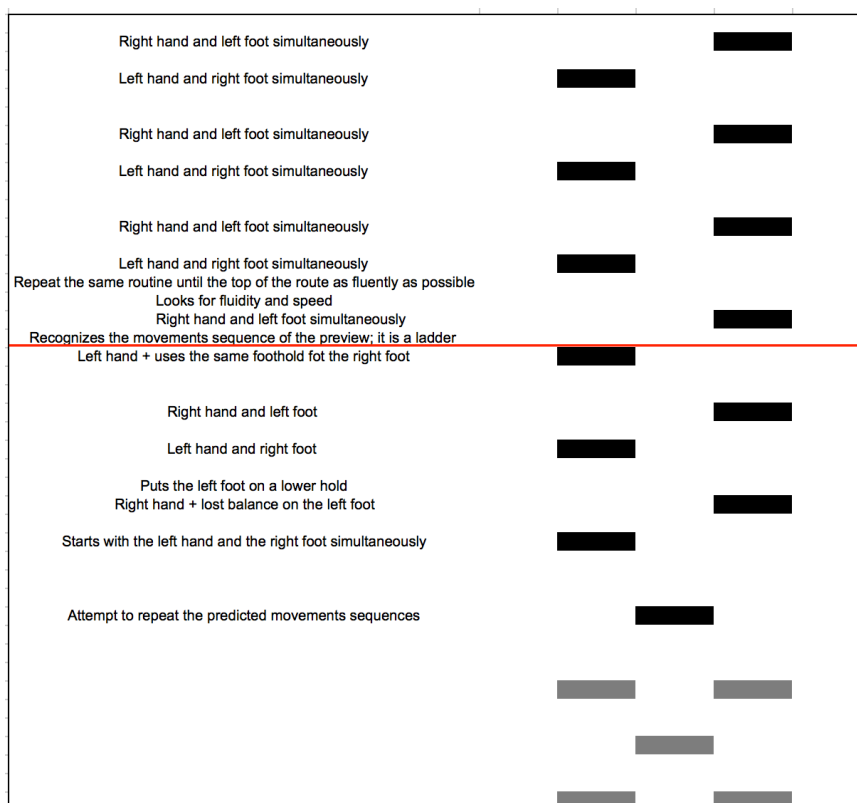

Figure 2. Depiction of a climber's experience during the climb. The layout of the holds is drawn on the right. The grey squares refer to footholds, while the black ones refer to handholds. In the first part of the route, the climber had issues of balance, which prompted him to adapt his feet placement; in the second part of the route (above the red line), the climber recognized the expected the movements sequences he repeated during the preview and sought to apply it as fluently as possible. Note that this route belongs to the pre-test; other routes of the practice sessions will be presented during the presentation

Discussion

These experiences showed that climbers' stream of activity is made of meaningful sequences, which embed actions, focalisations, concerns and meanings, highlighting that the sense-making process is fundamentally shaped by the interactions between the climbers' activity and their environment. Precisely, climbers' perception of their environment is mainly guided by the layout of the holds, in which they seek to find the most efficient movement sequences to climb the route as fluently as possible. Importantly, our results also suggested that the preview provide (1) a resource plan for effectively adapting to the issues enacted in situation (Suchman, 2006) and (2) an opportunity to detect affordances and movements sequences (Seifert, Cordier, Orth, & Courtine, 2017). As a practical perspective, this study explored some propositions for designing optimal practice environments that help beginner climbers enhance their adaptive sensori-motor strategies by inviting them to safely explore novel and functional behaviors. Specifically, proposing handholds layouts, which would – more or less implicitly – invite climbers either to (1) alternate (i.e., grasping the holds with the right and left hand successively) or (2) repeat (i.e., grasping the holds the same hand subsequently). In addition, the handholds layouts along the route would invite climbers to find an effective movement sequences vs a hold-by-hold exploration and hence, scaffold their exploration of the environment while previewing and climbing. Furthermore, conducting self-confrontation interviews after each practice session has transformative effects on climbers' activity – and hence, learning – and they can be considered as a learning situation per se. Indeed climbers, when seeing and commenting upon their activity, are invited to put more intelligibility on embodied processes and, in doing so, develop a reflective practice on their activity (Hauw, 2009). As a further perspective, these results could be associated to behavioral indicators, through the articulation of phenomenological data (i.e., first-person data) and behavioral data (third-person data), such as visual fixations in order to assess the visual-motor exploratory strategies during climbing and route previewing.

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