

Narrative in HCI: Interactions, Play, Games, Stories, Fictions and Envisioning Futures Using Activity Theory

Tim Marsh
Griffith Film School
Queensland College of Art
Griffith University
Brisbane, Australia
t.marsh@griffith.edu.au

Bonnie Nardi
Donald Bren School of Information
& Computer Sciences
University of California
Irvine, USA
nardi@ics.uci.edu

ABSTRACT

In this short position paper, we outline some of the findings following research on A. N. Leontiev's (1981) original activity theory including powerful and largely sidelined concepts, and propose extensions to bridge conceptual gaps. In particular, this work has focused on framing of activity through *lenses* and *spheres*, and on the relationship between object(ive) and motive and how they *coincide* or *merge* [1]. These provide fresh perspectives to reason about and inform design of today's rapidly evolving human technologically-mediated interactions and gameplay for experience and to provide a framework for writing, design fiction and inspiration for envisioning of future interactions and technologies. To illuminate this approach we have been focusing on the creation, modelling and shaping of narratives, scenarios, stories - in-game or interactions with and between applications and multiple platforms / transmedia.

Author Keywords

Activity theory, design, analysis, engagement, user experience, interaction, gameplay, games, games for learning, improvisation, interactive storytelling, transmedia, narrative, scenario, story, design fiction

INTRODUCTION

Research in activity theory applied to HCI has received considerable attention. However, this work is far from integrated in part due to the many and varied readings, interpretations, and proposals for extensions. In this position paper we describe our research focused on A. N. Leontiev's (1981) original activity theory contained in his first book and identify important and useful aspects and

Paste the appropriate copyright/license statement here. ACM now supports three different publication options:

- ACM copyright: ACM holds the copyright on the work. This is the historical approach.
- License: The author(s) retain copyright, but ACM receives an exclusive publication license.
- Open Access: The author(s) wish to pay for the work to be open access. The additional fee must be paid to ACM.

This text field is large enough to hold the appropriate release statement assuming it is single-spaced in TimesNewRoman 8 point font. Please do not change or modify the size of this text box.

Every submission will be assigned their own unique DOI string to be included here.

concepts that can be adapted and extended in an attempt to move activity theory from task / objective based to design and evaluation of human-computer interactions for user experience through engagement.

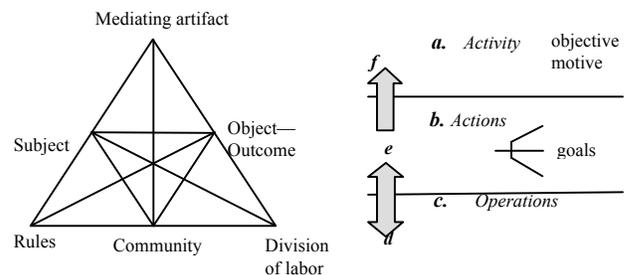


Figure. 1: Engeström's (1987, 1990) expanded triangle (left) and A. N. Leontiev's (1981) original hierarchical framework of activity (right)

BACKGROUND

Two main versions of activity theory currently co-exist, each with their roots in the work of Lev Vygotsky: A. N. Leontiev's [2, 3] original hierarchical framework of activity and Engeström's [4, 5] expanded triangle incorporating collective activity (figure 1). Interest from HCI and CSCW has primarily been on Engeström's [4, 5] version largely because of its expansion to analyze social/collective activities. As widely reported, Leontiev's (1981) activity theory focuses on individual activities. While this has been identified as one of its major limitations, Leontiev does however describe in detail *division of labour* and *connections* and *relations* to social activity (e.g. hunting).

While discussions comparing and contrasting these two approaches are not the focus and scope of this short position paper, it is interestingly to note that A. N. Leontiev's activity theory representing a Marxist psychology / philosophy developed in, and for, The Union of Soviet Socialist Republics (USSR/CCCP), focuses on individual activities. Whereas, Engeström's expanded triangle of activity theory developed in, and for, Western pluralist societies, focuses on collective activity. We have been exploring these issues and the extension of Leontiev's activity theory to capture individual in social activities.

A. N. Leontiev's work covers a broad range of subject areas and centers around organisms, intention, psyche and development. This lays the foundation for the work that he is best known for on human activity and its decomposition into a hierarchical framework of activity, actions and operations and characterized respectively by objective, goals and conditions.

Object(ive) and Motive: Coinciding and Merging

Activity is directed towards achieving an objective (as denoted by "a" Figure 1). The objective is a process characterizing the activity as a whole. The objective is closely related to motive, and the motive is the intention that stimulates and drives a user to interact / play. In activity theory, the objective's outcome and motive have to be considered in the analysis of "activity proper" [2].

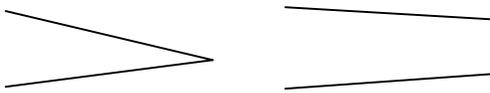


Figure. 2: Object(ive) *coincides* with motive (left) and object(ive) *merges* with motive (right)

There are two ways to reason about the relationship between objective outcome and motive, as illustrated in figure 2: (i) the first and widely published [6] way using Leontiev's (1981) original activity theory is the degree to which the outcome from objective "*coincides*" with motive. When the outcome from objective coincides with motive, it is fulfilled or complete and the activity ends, and as Leontiev (1981) states, this identifies "activity proper"; (ii) the second alternative way that we propose to assess the relationship between objective outcome and motive is through the degree to which objective outcome "*merges*" with motive which we argue also identifies "activity proper". This reading and interpretation of the relationship between objective outcome and motive has to our knowledge received very little if any attention nor has it been previously used in the assessment and design of activity. Merges implies two important aspects, firstly, the actions or processes undertaken are heading in the right direction and secondly, merges doesn't necessarily suggest an end point (as in: objective outcome coincides with motive) but suggests that as long as actions are contributing to the merging, then motive is being fulfilled or satisfied. So for example, if a motive to interact or play with technology is to be stimulated, entertained or "experienced" and the outcome from carrying out/performing processes provides just that, then the objective outcome merges towards motive. If this condition is maintained then users could hypothetically continue to be engaged in interaction or play indefinitely (or at least until some other need arises, from disruption or fatigue, etc.). This has far reaching implications for using Leontiev's (1981) activity theory for design of interaction and play for experience.

Lenses

The hierarchical structure is dynamic with shifts between activity, actions and operations orchestrated according to activity theoretical concepts and determined by situations and circumstances (of interaction and gameplay). Its power comes from its lens-like ability to focus on any level of abstraction from high-level descriptions of activities to zoom in to any level of detail/complexity. So providing a flexible and dynamic framework that supports design, development and analysis of interaction and gameplay.

Activity is made up of a combination of actions (Figure 2, "b"). The action level contains the heart of the narrative/scenario. As described in [6], this can incorporate text descriptions, graphics, storyboards, etc. to describe the interactions and gameplay. Actions are performed with conscious thought and effort, and are planned and directed towards achieving a goal. While actions have been considered similar to what the HCI literature refers to as tasks [7], Leontiev (1981) also refers to actions as processes. Herein we refer to actions as processes to provide a wider view of actions beyond tasks or task-based so that the goal of processes can be considered as experience. Actions/processes may themselves be made up of sub-processes directed towards sub-goals, and sub-processes can be made up of sub-sub-processes, and so on. This depends on the level of complexity in a narrative, scenario, and story of interaction/gameplay. Actions are performed by a combination of operations. Operations are performed with little conscious thought or effort in the use of physical interactive and virtual in-game artifacts triggered by conditions of actions ("c"). Users' shifts in focus between action and operation levels provide an indication of learning and reflection, focus shifts and breakdown and design opportunities ("d") [8, 9].

Spheres

Engagement infers positive characteristics, synonymous with quality of user experience in interaction and gameplay [10, 11]. While engagement typically implies flow-like interaction and gameplay with one application or game on a single platform, observation of real-world technology use also reveals additional and alternate patterns of engagement in interaction and play with a range of digital platforms, shifting between applications on one or more platforms. In this position paper we focus on engagement as a means to reason about quality of an experience, whether fun or enjoyable, stimulating, thought provoking, or difficult, scary, and darker experiences that are either pleasurable or a necessary part of a wider whole cultural experience [12].

Considering the relationship between objective and motive provides powerful ways to reason about people engaged in activity. If the outcome from objective coincides or merges with motive (that stimulated users to perform actions/process of an objective), then they are engaged in activity. Activity should not be considered as a holder or

container for action/processes and operations, but is defined by objective and motive that identifies user engagement in activity – we refer to this as sphere of engagement as illustrated in figure 3 (i).

During interaction with a product, technology or platform (tablet, notebook, desktop, smart phone, etc.), activities are created, ended, fulfilled or postponed. Users can become engaged in several applications (on-line, social media, game) in an interactive session/encounter. If the motive for interacting/play with each application is different, then activities representing each application are separate as depicted by the spheres of engagement in figure 3 (ii). But if the overall motive that stimulated a user to interact-play with a computer-based platform is shared between applications/activities (e.g. entertainment, stimulation) then they may dip-in and out of, switch or shift between applications/activities while at the same time remaining engaged (irrespective of kinds of user experience or types of entertainment). Here the sphere of engagement encapsulates more than one application/activity, figure 3 (iii).

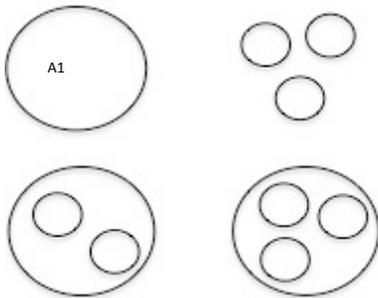


Figure 3: Sphere(s) of engagement - clockwise from top left: (i) User-player engaged in activity (A1); (ii) Engaged in separate activities; (iii) Encapsulating one or more applications / platforms; (iv) In-game / mediated activity and out-of-game / unmediated / real world activity

It's easier to appreciate spheres of engagement with many apps each represented by an activity that share a motive and are supported on one platform (tablet, notebook, desktop, smart phone) but what about applications (on-line, social media, games, video calls) supported on more than one platform? Likewise, we argue that if each activity shares a motive such as to be entertained or stimulated, etc. then the user / player can remain engaged in interaction /gameplay switching between apps and platforms and likewise a sphere of engagement is created/develops (figure 3, iii). Here the sphere of engagement encapsulates the real-world environment where the game is situated (figure 3, iv). This perspective has implications for design and analysis of in-

game and off-game, and mediated and non-mediated activities encapsulated through sphere of engagement.

NARRATIVE IN HCI

As well as task driven, today's interaction and gameplay is more free-spirited, unconstrained, non-linear, emergent, and of an improvised nature driven by user experience. Where users and players craft their own narratives, in-game and with and between applications and delivery platforms, by playing, selecting, searching, and creating. In this respect, users and players have been likened to editors, authors, designers and composers [13, 14]. A perspective similar to the "cut-up" technique attributed to Dadaists' poetry, practiced by artist writer Brion Gysin and William S. Burroughs [15] and various musicians like David Bowie and Kurt Cobain, whereby storylines, lyrics and points of view are created, cut-up into pieces and arranged "any which way" – a creative process that shapes narrative, meaning and experience. Similarly, like the cut-up, interruptions from email, messaging, or social media, provide anticipation that heightens experience and engagement. In many ways the "cut-up" and interruptions are similar to techniques used in filmmaking (e.g. French New Wave, Russian montage) that subvert the Hollywood style, and Brechtian and improvisational theatre, where devices are used at unpredictable moments in a production/performance to shape and heighten experience and engagement.

The activity-based narrative/scenario approach and associated concepts, provide a flexible framework for analysis and design of user / player interaction and gameplay with one or more applications on one or more platforms. For example, with users / players constructing their own narratives of user experience by shifting from app to app on one or more platforms according to tastes, interests, preferences, individual and group cultures and sub-cultures, as well as serendipitous and improvised on-the-fly interaction, and provides support for future interactions and gameplay. For example, increased interest from leading computing, software and social media corporations in emerging wearable platforms (e.g. VR / AR headsets, and watches) that can provide support for many apps on one platform. In addition, the hierarchical framework and concepts can model, describe, reason about and trace user / player interactions and gameplay it can also inform design for transitions between applications. Extending this idea, the activity-based narrative/scenario approach could be used to inform the design of devices for orchestrating or persuading user-player "cut-ups" between apps and services to heightened experiences and engagements.

Design Fiction

As well as users / players constructing their own narratives, we are exploring the approaches described herein for the design of future imagined narratives, interactions, play and games. This is a similar approach to that of "design fiction"

attributed to Bruce Stirling [16, 17] concerning the development of “fantasy prototypes” and receiving increased attention in HCI [18, 19]. As well as design of future imagined fiction using text descriptions, artwork, and storyboards, we are exploring the development of prototypes such as, film, machinima, games, and transmedia to provide inspiration for future technologies.

CONCLUSION

By considering the relationship between *object(ive)* and *motive as merging* [1], we have made steps forward towards activity theory being a more practical and theoretical approach for design and evaluation of human-computer interactions for user experience and so address a call suggested by Kaptelinin & Nardi (2006). Key advantages of our approach are on the one hand, it is sufficiently flexible to support narrative at any level of complexity, while on the other hand provides a standard template, language and concepts with which to frame narrative in HCI design and analysis. These provide fresh perspectives to reason about and inform design of today’s rapidly evolving human technologically-mediated interactions and gameplay for experience, and to provide inspiration for envisioning of future interactions and technologies.

REFERENCES

1. Marsh, T. and Nardi, B. Spheres and Lenses: Activity-Based Scenario/Narrative Approach for Design and Evaluation of Entertainment through Engagement, 13th International Conference on Entertainment Computing ICEC 2014, pp. 42-51 (2014).
2. Leontiev, A. N.: Activity, Consciousness, and Personality. Prentice-Hall (1978).
3. Leontiev, A. N.: Problems of the Development of the Mind. Moscow: Progress (1981).
4. Engeström, Y.: Learning by Expanding: An activity-theoretical approach to developmental research. Helsinki: Orienta-Konsultit (1987).
5. Engeström, Y.: Activity Theory and Individual and Social Transformation. In: Perspectives on Activity Theory-Learning in Doing Social, Cognitive and Computational Perspectives, Part 1: Theoretical Issues, edited by Y. Engeström, R. Miettinen, and P. Punamäki. Cambridge, UK: Cambridge University Press, pp. 19-38 (1999).
6. Marsh, T.: Activity-Based Scenario Design, Development and Assessment in Serious Games, Gaming and Cognition: Theories and Practice from the Learning Sciences, IGI Global (2010).
7. Nardi, B.: Context and Consciousness: Activity Theory and Human-Computer Interaction. Cambridge, Massachusetts: MIT Press (1996).
8. Winograd, T. and Flores, F.: Understanding Computers and Cognition: A New Foundation for Design. Norwood, NJ: Ablex Publishing Corporation (1986).
9. Bødker, S. Through the Interface – A Human Activity Approach to User Interface Design. Hillsdale, NJ: Lawrence Erlbaum Associates (1991).
10. O’Brien, H.L. & Toms, E.G.: What is user engagement? A conceptual framework for defining user engagement with technology. Journal of the American Society for Information Science & Technology, 59(6), 938- 955 (2008).
11. Schoenau-Fog, H., Louchart, S., Lim, T., & Soto-Sanfiel, M.T.: Narrative Engagement in Games – A Continuation Desire Perspective, Foundations of Digital Games (2013).
12. Marsh, T. and Costello, B.: Experience in serious games: between positive and serious experience, Serious Games Development & Applications, SGDA2012 (2012).
13. Danzico, L.: The Art of Editing: The New Old Skills for a Curated Life, XVII.1 Interactions, Jan/Feb (2010).
14. Marsh, T.: Users as editors and curators: activity framework for cultural media interaction design, Cultural Computing: Art, Culture and Technology, Workshop, ICEC2010, 9th International Conference on Entertainment Computing (2010).
15. Burroughs, W.S. and Gysin, B.: The Third Mind (1978).
16. Sterling B. Shaping Things. MIT Press Cambridge Massachusetts (2005).
17. Sterling B. Design Fictions. Interactions. Vol 16. Issue 3 (2009).
18. Kirman, B, Linehan, C., Lawson S. and O’Hara, D., CHI and the future Robot Enslavement of Mankind: A Retrospective. AltCHI CHI 2013 (2013).
19. Blythe, M. Research through design fiction: narrative in real and imaginary abstracts, Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, pp. 703-712 (2014).
20. Kaptelinin, V. and Nardi, B.: Acting with Technology: Activity Theory and Interaction Design, MIT Press (2006).