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Author(s): Jyväsjärvi, Heikki

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Reviewed by Heikki Jyväsjarvi¹

Introduction

Now, if ever, is the time for us to focus on the development of human mind, thinking, feeling and acting. The challenges we are facing now and in the future are and will be very complex in nature. We have to solve ill-defined problems and in order to do that we have to seek for new perspectives outside the box of our own comfort zones. We would need to be able to see multiple truths and create solutions that integrate different theories, worldviews and thinking paradigms. We would also need to find common grounds between different disciplines and academic research traditions – not to aim for confrontations, however easy and safe that might be.

Development of adult thinking: Interdisciplinary perspectives on cognitive development and adult learning offers us a perfect example of this kind of multidisciplinary, holistic and integrative way of thinking. It seeks to find commonalities between these different research fields - developmental psychology, adult learning and wisdom research - presenting the history and possible future of research on development of adult thinking and learning. Continuing the great pioneer work of the previous milestones such as *Beyond Formal Operations* (Commons et al., 1984) or *Reciprocal Handbook of Adult Development* (Hoare, 2011) this edition will find its way to the bookshelves of those readers, students and scholars interested in the development of the human mind, adult thinking and learning.

Summary of the Argument

This book aims “to seek and offer an integrative view on the development of adult thinking and learning processes” (Kallio, 2020, p. 1). Editor Kallio acknowledges the large variety of range covering these issues and the fact that there’s no way possible or even reasonable to introduce all different approaches to these themes. Thus, editor Kallio and all of the authors in this book describe some of the fundamental models and theories aiming for a bigger picture, holistic overview of the development and learning of the human mind, reaching towards wisdom. All of the chapters approach the main themes from a slightly different perspective, thus offering a reader a multiperspective synthesis of these complex phenomena.

Integrative thinking, as defined in this book, is thinking “where an individual integrates ideas and even opposing perspectives, is able to form a synthesis based on these different perspectives”

¹ **Heikki Jyväsjarvi** is a doctoral student at the University of Jyväskylä, Finland. He's working on his dissertation titled "Teachers' Meaning Making Structures and the Role of Emotions in Reflection - A Constructive-developmental Approach."
heikkijyvasjarvi@gmail.com



(Kallio, 2020, p. 157). Editor Eeva K. Kallio and the authors are aiming for making such integration between different disciplines and theories and they succeed in this great endeavor beautifully. The reader gets a very thorough presentation of the history and present of these research strands covering the development of thinking and learning. I think it resonates also perfectly among the readers familiar with the writings of Ken Wilber – integrative thinking as a concept seems to come very close to integral thinking (cf. Wilber, 1995). One of the main goals in this book is also to show the commonalities and mutuality in development of adult thinking, different learning theories and wisdom research.

Representing developmental psychology, social psychology, education and philosophy the authors of this book have succeeded in creating a dialogue and speaking in mutual language to build the bridges between all these different disciplinaries and perspectives. They all seem to have a same goal; trying to find an understanding between the concepts, theories and models and thus build a bigger narrative, a meta-view to the development of the human mind. An interesting feature of this book is that all the authors are Finnish. Finland appears to have lot to offer to the research field of adult developmental psychology, adult learning and wisdom research.

About the Editor

Eeva. K. Kallio, PhD, is Adjunct Professor at the University of Jyväskylä and University of Tampere, Finland. She is also a senior researcher in the Finnish Institute for Educational Research (FIER). Kallio is the leader of Wisdom and Learning research team and founding member and Honorary President of the European Society for Research in Adult Development (ESRAD). Her research interests are mainly theoretical, and they focus especially on development of adult thinking and wisdom.

Summary of Contents

The Development of Adult Thinking is divided in three sections. In the first section the major developmental stage models on cognitive and moral thinking are introduced (Chapters 2-6). The second section (Chapters 7-10) deals with adult learning and knowledge construction presenting the major trends of this research area. The last thematic section offers some new perspectives and discusses the methods and insights for future research.

Adult Thinking

In chapter 2 editor Eeva K. Kallio presents the major theories and models in adult developmental psychology. She also links these theories with modern wisdom research. This chapter gives the reader a great overview of the theoretical themes presented in this book.

The starting point of modern research on adult developmental thinking is Piaget's theory on cognitive development in childhood and adolescence. Piaget's stage model is represented here with respect but also showing the limitations of it. The main focus in Piaget's theory is the development of causal thinking, in other words logical reasoning or hypo-deductive thinking. According to Kallio one of the limitations of this theory is that it isn't applicable to different domains other than scientific reasoning. To interpret all human thinking through the lenses of

Piaget's stage model is seen as one form of reductionism (all thinking is logical reasoning with its true/false- statements). William Perry's research on epistemic assumptions about knowledge was a very important step forward and it paved the way for so called Neo-Piagetian theories. According to Kallio: "Perry was the first one to study the development of adult cognition from different perspectives instead of logical reasoning only." (Kallio, 2020, p. 17).

Kallio has already re-labelled adult thinking as integrative thinking (Kallio, 2011) and here she suggests that the terms postformal and relativistic-dialectical thinking could be replaced by the term *contextual integrative thinking*. Kallio's arguments are well presented here when she elaborates the differences in ontological pre-understandings between Piaget's theory of hard logic and more flexible logic of post-Piagetian scholars. For a reader entering this book this hermeneutical discussion is very important. There are also two very informative figures (fig. 2.1 and 2.2.) on pages 21–22. The figure 2.1 shows the three different modes of thinking (single-perspective, multiperspective and contextual integrative thinking). It also shows the way the previous mode is transcended but included in the next "stage" or thinking mode (cf. Wilber 1995). The figure 2.2 sums up the main research traditions presented in this chapter and ontological pre-assumptions related to different domains of thinking.

Finally, Kallio links contextual integrative thinking with wisdom research. She notes that the field of wisdom research (as well as developmental psychology) is highly heterogenous and full of diverse models and classifications. Thus, she suggests that "Wisdom as an Ideal Goal" would be a suitable umbrella term under which various domains of psychological and developmental research could integrate in a more comprehensive way.

This chapter is truly an integrating endeavor. It shows the great diversity and even fragmentation of the research field on adult development but also makes clear how all the different viewpoints or paths somehow lead to the same direction – outlining the same phenomenon.

On Epistemologies

In chapter 3 authors Hannele Seppälä, Sari Lindblom-Ylänne and Eeva Kallio delve deeper into development of logical reasoning and epistemic knowledge – especially aiming at integrating these two main lines of research in adult cognition.

This chapter shows connections between aforementioned approaches with an example of a study on higher education students in Finland. The results of this study indicate the connection between logical reasoning skills and development of epistemic knowledge: "The findings suggest that good reasoning abilities reinforce the notion about the individual's own role in knowledge construction" (Kallio, 2020, p. 42).

As a conclusion the authors discuss how to enhance adults' thinking skills especially in the context of higher education. They emphasize the importance of encouraging students to take an active role in creating the learning process and allowing the students to doubt and question, share their views and thus "develop their thinking in dialogue and co-operation with others" (Kallio, 2020, p. 43).

Anna-Maija Pirttilä-Backman, Salla Ahola, and Inari Sakki continue to present the well-known Reflective Judgment Model by Karen Kitchener (1978) and Patricia King (1977) in chapter 4. They describe the development of personal epistemologies and Kitchener's and King's interviewing methods, comparing them to Perry's. According to King and Kitchener knowledge is seen as the result of critical combination and evaluation of standpoints and evidence at the highest stage of this model (Kallio, 2020; King & Kitchener 1994). Authors of this chapter introduce also some Finnish studies which have used King and Kitchener's methods and Reflective Judgment Model (e.g. Kajanne, 2003; Pirttilä-Backman, 1993; Pirttilä-Backman & Kajanne, 2001). These studies have been made in different educational levels and educational fields and there's been a strong connection between different theories of truth.

Moral Development

In chapter 5 Soile Juujärvi and Klaus Helkama discuss the moral developmental theories of Lawrence Kohlberg (1976) and Carol Gilligan (1982). Kohlberg's theory emphasizes the perspective of justice and Gilligan offers the perspective of care in her critique on Kohlberg's "male point of view". These parallel and maybe contradictory views are very interesting, and this kind of integrative approach is more than needed. Wilber (1995) argues very similarly that there's no use to make confrontations between Kohlberg's and Gilligan's theories. We need more both- and discussion to get a more holistic view on many dimensions of moral development. Here Kohlberg's and Gilligan's views on moral development are approached with an integrated perspective. The ethic of care is seen dealing with issues of micro-morality (close relationships) whereas justice of reason is focused on macro-morality (including also strangers beyond community). They are nevertheless often intertwined in moral conflicts of our everyday life. So, these two theories can support and contradict each other at the same time. They are also very much context dependent and the correlation between them is obvious – with variations among individuals of course. They get fused and integrated especially in postconventional moral thought in mature adulthood. As it seems to be the combining theme with all the articles in this book the authors see the development and integration of both moral perspectives - justice and care - as an essential component of wisdom.

Closing the first section of the book the authors of chapter 6 Jaana-Piia Mäkinieniemi and Annukka Vainio broaden the view of morality from Kohlberg's and Gilligan's views presenting recent theories of moral development. The authors note that the need for widening the views of morality has emerged from the fact that justice and care components couldn't cover all the moral issues especially in the domain of cultural psychology. Furthermore, they argue that there is a disagreement among researchers of what belongs to the moral domain.

Adult Learning

The second section of this book (chapters 7-10) addresses the perspectives on adult learning. In chapter 7 authors Mari Murtonen and Erno Lehtinen open the discussion with a very intensive overview of different theories of learning. Following the main idea of this edition, authors address learning as a complex and adaptive system with several levels.

This chapter presents also different philosophical perspectives on learning. I think that this part is very important because it addresses the epistemological and ontological issues of learning. Murtonen and Lehtinen continue discussing the theories on different levels (individual, social and cultural) of adult learning. At individual level the cognitive, motivational, metacognitive and regulation theories are presented in great detail. The authors aim to form a synthesis integrating these different theories which I find very interesting and ambitious. The authors present also a “warming trend” in educational theories when discussing the importance of different motivational, metacognitive and regulation processes of learning. Meta-cognitive and regulation skills are seen as very important factors when it comes to high-quality learning.

Metacognition, Tacit Knowledge and Expertise

In chapter 8 the authors Mikkilä-Erdmann and Iiskala combine the theories of conceptual change and metacognition. Their article illuminates the connection between these two theoretical approaches and the benefits of creating an interaction between them. The authors refer to the research on Finnish medical students and classroom teacher students (e.g. Ahopelto, Mikkilä-Erdmann, Olkinuora, & Kääpä, 2011; Ahopelto, Mikkilä-Erdmann, Anto, & Penttinen, 2011). The findings show that even high-performing students in higher education have misconceptions in basic phenomena such as cardiovascular system or photosynthesis. According to the authors conceptual change needs metacognitive skills and this meta-conceptual change is obviously time consuming. Learning environments (i.e. curriculum, learning materials, teaching and learning strategies) should support students’ metacognitive growth and metaconceptual awareness in order to create real revisional learning and students’ awareness in their epistemological systems.

Tacit knowledge is another concept that seems very hard to define. In chapter 9 Auli Toom and Jukka Husu aim to untangle the shared core questions on tacit knowledge and present a model in which the characteristics of tacit knowledge and expertise are intertwined into four different perspectives. In this model they elaborate expertise, tacit knowledge and knowing both from individual and collective perspectives. The nature of knowledge (from process to product) is also well presented in figure 9.2. (Kallio, 2020, p. 151). In discussion Toom and Husu ask whether we are in danger of losing something essential regarding the tacit knowledge of experts such as features like affectivity, spontaneity and interactivity.

For me one of the key chapters in this book is chapter 10. Authors Päivi Tynjälä, Eeva K. Kallio and Hannu L.T. Heikkinen create a great synthesis of modern research on adult thinking and expertise, wisdom research and Aristotelian forms of knowledge. One of the main concepts in this edition, integrative thinking, is the focal point here. This chapter introduces the theories of professional expertise and elaborate the term integrative thinking in more depth. It also presents different wisdom models and draws connections between development of expertise and wisdom. And finally, the authors illuminate the aforementioned research areas and theories with the philosophical background, Aristotle’s forms of knowledge and Habermas’ Theory of Knowledge and Human Interests. Figure 10.1 (p. 169) illustrates this synthesis in an illuminating way. It is simple and very informative, and I personally enjoyed how the emotional dimension is shown here.

Opening Discussion for Future Research

Beginning the last section of this book chapter 11 presents a critical review of research methodology used when studying epistemic assumptions, concepts of knowledge and knowing. The authors Hyytinen, Postareff and Lindblom-Ylänne elaborate the methods being used from the days of William Perry to the present. Although the self-reporting methods and quantitative questionnaires have been quite popular in the eighties and nineties, they have been critiqued recently. Many researchers have found that epistemic conceptions are characteristically abstract constructs and therefore very hard to be measured with these kinds of assessments. The students' interpretations of these concepts have been inconsistent with the researchers' intended meanings and assumptions. Thus, the authors suggest that mixed- or multi-method approaches would be needed. In figure 11.1 they present two main strategies when using these approaches. In sequential strategy the researcher uses the follow-up phase aiming to answer the unanswered questions of the first phase. In concurrent strategy the researcher uses two or more data collection and analytical methods simultaneously. Furthermore, the authors note that authentic methods have been found to be rich sources when collecting data because they provide an opportunity to deepen the understanding of the nature of thinking.

In chapter 12 the development of adult thinking is reflected through the lens of systems thinking. This systems perspective is almost obligatory given the main idea of this edition. As the authors note: "Its foundations lie in different systems theories that take a comprehensive and multidisciplinary view on exploring phenomena" (Kallio, 2020, p. 191). The aim of this chapter is to link systems approaches on the development of adult thinking. The authors present the three systems paradigms (closed, open and dynamic systems) which are presented in table 12.1. (Kallio, 2020, p. 196).

Kallio's (2015) critical reflections on Piaget's paradigmatic choices are very important here as they rise from the dynamic systems paradigms. Piaget's theory appears to be grounded in the closed systems paradigm (e.g. development of causal thinking has a final endpoint) whereas Perry's approach represents more open or even dynamic systems paradigm (e.g. complexity, self-transformability).

The authors Ståhle, Mononen, Tynjälä and Kallio then delve deeper into the third systems paradigm and the theories of Prigogine (1976) and Maturana & Varela (1980, 1992) in particular. Although these theories were first created in physical/chemical and biological domains, they have been found to be applicable to social systems as well. Prigogine's self-organizing system and Maturana and Varela's self-referential system are well introduced and elaborated here. The link between the dynamic systems theories and adult development thinking is very visible in the works of Sinnott (1998), whose theory of post-formal thinking is grounded in the dynamic systems paradigm. I find this linking and comparing Sinnott's theories with self-organizing and self-referential systems very illuminating.

Systems theories and these open and dynamic systems paradigms have a clear connection with the theories of development of thinking and learning. Future research on these domains would clearly benefit from systems approach. Now after reading this book once more I find this chapter the most useful for my own future studies.

This edited volume closes up with Tuominen and Kallio's critical philosophical reflection on the psychological models of adult cognitive development. The authors note that the psychological and philosophical approaches to logical contradictions and epistemological relativism differ from each other. While developmental psychology studies thinking in empirical subject, the philosophical logic deals with logical validity. I think it is very important to build these bridges between philosophy and cognitive psychology since they both approach the same phenomena, thinking and knowing, but with different perspective. This kind of critical reflection reveals some problems when describing adult cognitive development and we should definitely be aware of them. Especially the central concepts in developmental psychology, epistemology and relativism, have a different meaning in developmental psychology and philosophy. The differences in psychological and philosophical epistemology are elaborated with concrete examples and the authors show how the epistemologies of the students in Perry's research have quite different character than in traditional philosophical epistemology. "The truths" in Perry's studies are much more subjective beliefs on the way truth appears to the subjects in the study. Philosophy tends to approach the logic of truth in a more "philosophical" way and that creates some confusion with the concept of epistemology.

The discussion on dialectical thinking is very interesting and again I find some similarities with the writings of Ken Wilber here. The notion that things have their features only in relation to something else or things appear to be one thing but at the same time they are also something else depending on the context or a perspective sounds very integral to me. The works of pioneers in dialectical approach to developmental psychology, Riegel's (1973, 1976) and Basseches' (1984, 2005) are introduced here and especially Riegel's model of perspectives in four dimensions (Kallio, 2020, p. 214) comes very close to Wilber's four quadrant model.

Once again, the authors bring forth the limitations of Piaget's theories. The well-defined problems that were the basis of Piaget's research are based on the "old" machine paradigm and thus may not cover the ill-defined nature of human thinking and problems we are facing especially in today's world. We have to find more than true or false solutions to the challenges we are facing. We need problem solving that seeks for "the truths" from many different perspectives and shares also many contradictory truths. Of course, it's easier to think in simplified dichotomies choosing one from two opposite choices. And that is why we often tend to think in dichotomies. In dialectical thinking both solutions might be true or false at the same time and the problem might get solved integrating them or maybe finding a third solution. The discussion on contrary or contradictory opposites are very important here and again show the differences between the philosophical logic and classical views of cognitive psychology. As the authors note: "...one crucial difference between youthful and mature ways of thinking could be that latter can recognize which oppositions are which and whether some conflicting notions exhaust the logical space or not, while the former tends to see all conflicts as ones in which it is necessary to choose between two given options" (Kallio, 2020, p. 218).

This chapter shows how important it is to differentiate these two approaches (PhilEp and PsyEp) to epistemology. They argue that to avoid confusion we should aim for analysis of mature ways of thinking in terms of integration. Integration differs from epistemological relativism since "it does not require that one assumes different standards of truth for different views" (Kallio, 2020, p. 224). The ability to integrate different perspectives and standpoints along with different and sometimes

very strong emotions in complex situations is the kind of mature adult way of thinking that goes beyond formal cognitive thinking and so-called unrestricted relativism. I'm sure that this chapter and the whole edition opens up a very important discussion for the future. Now if ever is the time to critically seek new ground for future studies on development of adult thinking and life-long learning in adulthood. This book offers us many important perspectives and new insight on these important themes.

Conclusion

This edition succeeds to offer a thorough insight to the research on adult development and learning. It shows how closely intertwined all these themes are and how they share many commonalities. The biggest strength of this edition is that it succeeds to build some bridges between different disciplines and research strands. It really takes a multiperspective approach to development of human thinking and learning.

As I mentioned earlier, this book stands tall before the previous landmark books on neo-Piagetian adult developmental psychology. *Beyond formal operations* (Commons et al., 1984) was a kick-off for this research tradition. I personally find it pretty heavy to read and I think this edition is easier to approach. I find that Hoare's (2011) edition shares a lot of similarities with the book under review here. Development of adult thinking is very logically constructed and all the articles seem to continue where the previous one left off. This is one of its strengths compared to Hoare's edition. Also, the conceptual analysis regarding post-formal thinking, epistemological relativism and dialectical thinking (especially in chapter 13) stands out as one of the key merits of this book compared to others. The way the integrative thinking and integration of cognition and other elements of learning and developing are articulated and synthesized here is what makes this book a landmark and definite must-have alongside the aforementioned books.

The fact that all the authors are from Finland might be considered as one limitation of this book. The long-term contribution of this book depends on how widely it opens up the global discussion on these topics. I hope that this edition will be an inspiration to scholars around the globe and maybe have an internationally updated edition one day.

Development of adult thinking is a wonderful example of integrative thinking in action. It presents different theories and viewpoints from multiple areas of research. It aims to form a synthesis where these different perspectives can fuse and integrate to create a more holistic view of development, learning and wisdom. I recommend this edition to everyone interested in development of human thinking and learning. It is an important handbook for every scholar and student studying these phenomena.

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