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Integrative Thinking is the Key: an Evaluation of Current Research into the Development of Adult Thinking[i]

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Abstract

Post-formal relativistic-dialectical thinking has been widely claimed to be a new developmental stage of intellectual development. Other theoretical models come very close to post-formal thinking with overlapping features, such as the study of wisdom and epistemic understanding, as well as models of expertise, critical thinking and skepticism. No coherent theory exists in fields of post-formal and relativistic-dialectical thinking, though scholars have claimed that there is some similarity between the models. While empirical evidence of interconnectedness between them exists, a major difficulty lies in the theoretical definition of concepts. We critically assess the definitions of relativism and dialectical thinking and show these to be ambiguous and weakly defined terms. Instead we argue that the notion of 'integrative thinking' should be used instead of 'post-formal' or 'relativistic-dialectical thinking'. Integration can be additive or transformative. Transformational integration of various psychological domains seems to be the core component in models of adult cognitive development.

Keywords: theoretical analysis, integrative thinking, adult development, development of thinking, post-formal thinking, relativistic-dialectical thinking, epistemic understanding,wisdom

Integrative Thinking is the Key: an Evaluation of Current Research into the Development of Adult Thinking

Research on adult thinking has aroused keen interest in the topic in different fields of research during the last few decades. Indeed, scholars from separate traditions of thought have introduced different conceptualizations pertinent to this topic. However, there seems to be at least some consensus as to the characteristics of the phenomenon under study, and this has been shown in meta-theoretical analyses (Gurba, 2005; Hoare 2006a; Kramer, 1983; Marchand, 2001). Moreover, the richness of adult cognition has been described from various perspectives, viewpoints and models. For this reason, I will first briefly describe and define the major lines of research within the field.

The most general way of expressing the focus of a study is to simply take the study of adult thinking as referring to the study of mature cognition and intellectual capacity with its possibilities, boundaries, and limits. This kind of approach under a very general rubric of adult cognition is obvious, for example, in information-processing theories, focusing on intelligence capacities in general and their progress and decline during the lifespan (Schaie & Zanjani, 2006). Secondly, and more importantly here, adult thinking is studied from a developmental psychological perspective, which is mostly based on Piagetian theory, but also on some other major psychological theories; especially those of William Perry (1970) and C.G. Jung (1981).

These numerous adult thinking models, based on a developmental psychological perspective, are labelled in terms of *relativistic* and *dialectical* thinking, but these words are also very often conjoined in the form of *relativistic-dialectical* thinking. According to

Kramer (1983), three features are thus included in thinking: (1) the realization of the relativistic, non-absolute nature of knowledge, (2) an acceptance of contradiction, and (3) integration of contradiction into an overriding whole. In this tradition, it is also common to describe adult cognitive development with the concept of *post-formal* thinking, as synonymous with relativistic-dialectical thinking (for various forms of use, see Bassett 2006). Post-formal thinking is supposed to be the highest stage of thinking in adulthood, as the theoretical basis is connected to the idea of a stage-like developmental progress of cognition during the lifespan. What is taken to be the highest stage is either supposed to be hierarchically or non-hierarchically linked to previous development, forming either a so-called hard or soft stage, level, or phase of development (Alexander & Langer, 1990; Marchand, 2001).

The connection between the models of relativistic-dialectical thinking and the study of wisdom has been pointed out by many scholars. During recent decades, research on wisdom has become increasingly important, especially in the field of gerontology. The word *wisdom* has many meanings: it is a complex phenomenon and several different conceptualizations have been made (Bassett, 2006). According to Yang (2008), several models of wisdom can be classified; namely (1) wisdom as a personality characteristic, (2) as a positive result of development, (3) as a collective system of knowledge about the meaning and conduct of life, and (4) as a real-life process that is completed after certain effects are generated. According to Kitchener, King and DeLuca (2006, p. 73), wisdom can be defined as “expert knowledge involving good judgment and advice in the domain, fundamental pragmatics of life”, or as including the notion that “knowledge is uncertain and that it is not possible to be absolutely certain at any given time.” According to Ardelt

(2009), "[a] wise person might have integrated the feminine and masculine aspects of wisdom" (p. 9). Kunzmann and Stange (2006, p. 306) see "[…] the core concept of wisdom to be the notion of a perfect, perhaps utopian integration of knowledge and character, mind and virtue." They also claim that wisdom facilitates an integrative and holistic approach to life in various fields. For the purposes of this article, it is, however, interesting to note that perhaps the most prominent proponents of wisdom, Baltes and Staudinger (2000), see relativistic-dialectical post-formal thinking as a cognitive sub-component of wisdom, indicating that the relationship between these constructs is supposed to be close. Kunzmann and Stange (2006) also note the close link between wisdom and post-formal relativistic-dialectical thinking (p. 311, chapter "Wisdom as post-formal stage of cognitive development").

The third very important branch of study concerned with adult thinking skills is research on epistemic understanding, understood as the study of assumptions about the certainty of knowledge claims, argumentation, and the limits of knowledge; for example, addressing questions such as what is knowledge and how can it be argued for (Kitchener, King & DeLuca, 2006; see also Baxter-Magolda, 2004). Many different models and approaches of epistemic understanding exist (Limon, 2006), the first of which was the model proposed by Perry (1970). Limon (2006) claims that the following traditions among the current conceptualizations of epistemological understanding exist: (1) developmental models (similar to Perry's, although not mentioned by Limon); (2) construction of a system of beliefs, and (3) personal epistemology/epistemological resources models. The first tradition mentioned (i.e. developmental models of epistemic beliefs) is the closest candidate to the subject of this article. According to Kitchener, King

and DeLuca (2006, p. 83), the central defining feature of their epistemological framework is that "[…] thinking becomes more complex, differentiated, and integrated over the life span." According to Kuhn and Weinstock (2002, p.123), "[the] developmental task that underlines the achievement of mature epistemological understanding is the task of coordination of subjective and objective dimensions of knowing […] Finally, the two are coordinated, with a balance achieved." Thus Kuhn and Weinstock's (2002) model focuses on the integration of a subjective and an objective view of knowledge. The highest achievement of epistemic development is not solely to critically evaluate different perspectives, but also to create a meaningful, self-referential conclusion from them.

The traditions in the study of critical thinking (Phillips & Bond, 2004) and the development of doubt and scepticism (Chandler, Boyes & Ball, 1990) are also related variations on the theme of the development of epistemic beliefs. As is the case with post-formal relativistic-dialectical thinking and wisdom, no coherent body of theory of epistemic cognition exists (Niessen, Abma, Widdershoven, van der Vleuten & Akkerman, 2008; see also Limon, 2006 and Hofer & Pintrich, 2002).

To complicate this issue further, there are also other traditions of research, similar in nature to those mentioned above, which focus on adult human cognition or learning processes in various forms. The study of expertise (reflective practice) as a form of learning in adulthood is an established branch of research, especially in the field of educational psychology (Merriam & Clark, 2006). The more one is a novice, the more dependent one is on external, learned academic knowledge: furthermore, the more experienced one is, the more academic knowledge becomes integrated with pragmatic silent experience. According to a brief definition of expertise, with practical experience

one is able to make judgments in complex, contradictory situations based on tacit knowledge (Bereiter & Scardamalia, 1993). Practical knowledge is, thus, integrated with theoretical knowledge. It has to be noted that, as scholars of wisdom, Baltes and Staudinger (2000) have linked their model of wisdom with the notion of expert knowledge.

On the face of things, the diversity and lack of uniform terminology used to describe adult thinking has resulted in some confusion and fragmentation. However, scholars discuss the connections between the aforementioned traditions in their scientific papers and seem to be aware of the closeness of the relationship between them (Baltes & Staudinger, 2000; Commons & Bresette, 2006; Kitchener, King & DeLuca, 2006). Preliminary empirical research on the interconnectedness between the three first-mentioned models (post-formal relativistic-dialectical thinking, wisdom, and epistemic understanding) suggests that they share common features and, thus, gives us reason to assume that they deal, at least partially, with the same phenomenon. As an example, scholars have identified a connection between wisdom and relativistic-dialectical beliefs (Lyster, 1996; Kramer, 2003). A large study, in which the problem-finding ability, dialectical reasoning, relativistic operations, and reflective judgement (epistemic development) were evaluated at the same time (Yan & Arlin, 1995), has been conducted: the study revealed that there is a unifying commonality – non-absolutistic relativistic thought – between the mentioned models. Furthermore, Kitchener, King, and DeLuca (2006, p. 81) claim that “relationships between [the] Reflective Judgement Model, and skill levels are apparent.” This refers to Kitchener and King’s epistemic model of

epistemic development (RMJ), and to Fischer's skill theory (the latter has been explicitly labelled as a neo-Piagetian model by the author, see Rose, Todd & Fischer, 2009).

Hence, there is at least some empirical evidence of the closeness of some models of post-formal relativistic-dialectical thinking, epistemic understanding, and wisdom. However, systematic research on the common factors between the numerous models has not been carried out. One important question also remains; namely what is the nature of the interconnection between the models in the aforementioned fields? As has been already pointed out, there is some empirical research indicating that at least some models do indeed seem to be interconnected. Thus, some similarities (or at least correlations) seem to exist between the models.

Relativistic-Dialectical or Post-formal Thinking: Historical Roots of the Terminology

The remaining discussion focuses specifically on post-formal and relativistic-dialectical thinking and, when pertinent, on the features of some of the closely related traditions mentioned above. Two names are of considerable importance in research on the development of adult thinking: Piaget (Inhelder & Piaget, 1958) and Perry (1970).

Historically, the first to consider is Piaget, whose contribution was mainly the description of the early phases of development in childhood. Strictly defined, the focus of his theory is on evaluating logical-causal thinking: how well-defined, closed-system1

[1] According to Churchman (1971) and Wood (1983), it is possible to differentiate separate types of problems: well- and ill-structured, and also open and closed system ones. The ill-structured problem refers to problems and tasks that cannot be solved with a high degree of certainty, because the given information is not complete (also called open system problems); in well-defined problems, in contrast, there is a fixed and complete space in which one possible solution resides (called closed system problems).

natural scientific problems can be solved, and how it becomes possible to find mechanical cause-effect relationships between variables (Inhelder & Piaget, 1958). As Piaget pointed out, this form of thinking is suitable only in domains understood to be natural scientific and technical, covering problems in physics, chemistry, mechanics, biology, and so on (Inhelder & Piaget, 1958; see also Lourenco & Machado, 1996). The highest form of this kind of reasoning is called formal reasoning, in which the core is the ability to handle causal reasoning in its highest forms. The concept of post-formal thinking has emerged in scientific discussion during recent decades. It has been claimed that what is at stake is a more complex form of adult thinking than formal thinking and a new stage after formal thinking. Nowadays, there are numerous models claiming to describe this new form of thinking (Commons & Bresette, 2006; Marchand, 2001).

Perry (1970) was the first to re-define the nature of the study of adult cognition. This line of research can be defined as research into conceptual change, contrasted with the concern of Piaget's theory on the study of operational-logical cognition. Perry's research focused on the development of epistemological assumptions in young adulthood (in addition, the model focuses on identity formation and moral development). He found that, in epistemic understanding, the progress through stages can briefly be described as follows: a) dualism – there is assumption that knowledge is given from outside by authorities and its truth status is absolute; b) relativism – referring to understanding different viewpoints and their evaluation; c) commitment – forming a subjective conclusion or a synthesis on the basis of reflected viewpoints.

Similar three-phase-models describing adult cognition have gained wide currency since Perry's theorization, labelled as models of post-formal thinking. According to

Kramer (1983), all of the so-called post-formal models of thinking, regardless of the domain of thinking, explicitly or implicitly include similar three-phase-constructs, but with different labels. Kramer's (1983) conclusion is that these three phases are *absolutism*, *relativism*, and *dialectical thinking*. In the case of absolutistic thinking (which is correlated with formal thinking in the Piagetian theory), one is not able to broaden one's own perspectives, which is possible in relativism and dialectical thinking. In addition to the mentioned psychological features, Kramer (1983) has analysed the aforementioned construct from a philosophical standpoint. There seem to be different world views as background assumptions between formal and post-formal thinking: in the first case, mechanistic and static, and in the second, contextualist and dynamic. Thus, it is claimed that there is a radical change of metaphysical and epistemological presuppositions with the emergence of new thinking forms during the transition from youth to adulthood.

It seems that the concept of post-formal thinking originally sprang from Piaget's theory, meaning literally the phase after formal thinking, but the identification and designation of the phases is derived from Perry's ideas. As a phenomenon, post-formal thinking can, thus, be seen as a combined construct emerging from two different traditions in the study of cognition; namely research into operational-logical thinking and the investigation of conceptual thinking.

Relativistic-Dialectical Post-formal Thinking in Different Domains

In the domain of logical thinking, some scholars have stayed close to Piaget's theory and modified it so that the highest forms of thinking are labelled as post-formal stages. This is

especially so in the case of Commons and his group (e.g. Commons, Richards & Kuhn, 1982; Commons & Bresette, 2006), who have explicitly continued the tradition of studying solely logical thinking skills. Commons has described the further development of causal thinking as progress towards more complicated causal structures: named systematic, meta-systematic, paradigmatic, and cross-paradigmatic reasoning. This model has also been called General Stage Theory (GST). The focus of the theory has since shifted towards the construction of a new assessment method called the Model of Hierarchical Complexity (MHC). According to Commons (Commons & Bresette, 2006), MHC is a scoring instrument that is content- and context-free, applicable to any performance in any domain. The focus, here, is on the analysis and scoring of the hierarchical complexity of behaviour, and, in this process, the sequences of the stages of complexity similar to those in the GST model are introduced (Commons & Bresette, 2006; for other, related developmental assessment models see Dawson-Tunik, 2006; Fischer, Yan & Stewart, 2003).

Commons' model of reasoning in its original form (GST) is based on closed-system logic with well-defined problems using causal reasoning (MHC is, in contrast, merely a method for developmental stage assessment). According to Commons and his colleagues, the highest forms of logical reasoning are integrative: lower-level causal systems or paradigms are integrated in a meta-system or cross-paradigmatic ones, and the contradictions between competitive lower-level models are thus solved (Commons & Bresette, 2006).

Critics, however, have claimed that such models do not take into account the intermediate variables of the personality, self, context, history, or social life; instead, they

rely too heavily on purely abstract systems, limited in their applicability to different domains of adult life (Alexander & Langer, 1990; Labouvie-Vief & Diehl, 2000; Sinnott, 1998).

In the following, I focus on the models that have widened the scope of Piaget's theory of causal thinking by advancing, and even going beyond, the line of epistemic understanding begun by Perry (1970). In addition to logical cognition, several other personal, social, and environmental factors have been taken into account in the new psychological models: the strengthening of the role of autonomy and self-authorship, mature perspective taking as socio-cognitive development, emotional development, and the integration of pragmatic knowledge into theoretical knowledge.

Piagetian theory is, thus, expanded by including different domains under the rubric of adult cognitive development. Firstly, the development of autonomy and the strengthening of the self that takes place in adulthood is a slow and continual process. Adult autonomy includes the capacity for self-governance and how one conducts oneself (Kegan, 1994). The complexity of adult life is handled with the sophisticated forms of cognition that start to emerge: formal logic, as such, is not enough. Hence, adult thinking, at least to some extent, detaches itself from external influence and from following the regulations imposed by others – in other words, it becomes autonomous (Labouvie-Vief & Diehl, 2000). Kegan (1994) has called this mature capacity 'self-authorship', which has a coordinative and integrative function across several psychological domains; Sinnott (1998) calls this 'self-referential thought'.

Using pure causal logic in well-defined problems leads to solutions that obey the laws of logic. Following the logical rules is not denied, but one is able to question the

relevance of using them uncritically in domains of social action and experience – for example, when phenomenologically describing one's subjective feelings and tacit knowledge rising from the experiences of everyday life. Thus, there are multiple solutions and methods (Sinnott, 1998). Here, the idea of subjectivity indirectly becomes a part of thinking and knowledge formation. Adults are more sceptical than young people about the possibility of pure objective knowledge, and they are aware of the fact that personal preferences, values, attitudes, world-views, and life experiences, as well as many other similar factors, influence thought processes and the human mind (Labouvie-Vief, 1994).

Secondly, socio-cognitive development, for its part, is tied to the development of logical thinking through understanding the relative nature of knowledge-formation, as already mentioned in the case of Perry's model. Acting in social groups, the demands of working life, as well as the new developmental tasks of adulthood, force the individual to tolerate, evaluate, and reflect upon the different points of view, frameworks, and worldviews expressed by others (Sinnott, 1998). Thus, socio-cognitive perspective taking becomes part of adults' development of knowledge, and this becomes important for many reasons: in a globalized world, cultural diversity, different religions and values meet, and the ability to adapt becomes increasingly important. The ability to understand complex relationships and deal with ill-structured problems with no clear-cut objective solutions implied, is relativistic thought, which is assumed not only to be the central feature of adult thinking in the models of post-formal thinking, but also in the models of epistemic understanding and wisdom (Baltes & Staudinger, 2000; Kitchener, King & DeLuca, 2006; Kramer, 1983).

Thirdly, the integration of the development of affects and emotions into cognitive development is highlighted. The major proponent of this tradition has been Labouvie-Vief and her associates (Labouvie-Vief, 1994; Labouvie-Vief & Diehl, 2000). Labouvie-Vief's critique focuses on our culture's explicit prizing of intellectual capacity, as is the case in Piaget's theory. Other parts of the human psyche, mainly prominent in childhood, have to be repressed as irrational material, and are labelled as infantile and immature from the adult's perspective. These psychological features include, for example, imagination, mythological-symbolic language, emotional expressions, and primitive affections. Along much the same lines as Jung's (1981) individuation theory, Labouvie-Vief considers the integration of these two fields necessary in adulthood. Such reference to the integration of emotions (mythos) and reason (logos) repeats the theme of attempting to reconcile two parallel, opposite or contradictory, and seemingly different psychological frameworks; although, in this case, the integration is intra-psychological (Labouvie-Vief, 1994).

The fourth important feature in post-formal relativistic-dialectical thinking models is the integration of theoretical knowledge with practical knowledge. It has been claimed that the highly abstract nature of formal reasoning is not in accordance with the everyday pragmatic problem solving of adults (Cavanaugh, Kramer, Sinnott, Camp & Markley, 1985). In adulthood, the important point of transition is when one moves into working life, with the subsequent expansion of one's social life and new roles. Causal thinking, based on logical reasoning, is understood as something that is only applicable to a limited extent. In everyday life, problematic situations may well require different solutions based on practical experience (Cavanaugh et al., 1985). Briefly, formal thinking is considered to

be limited in its applicability within domains lacking clear-cut logical solutions. It is acknowledged that expertise and specialization, for example in one's profession, cause changes in thought patterns. Research outside the post-formal relativistic-dialectical thinking tradition seems to indicate that higher-order mental capacities are indeed needed for professional competence in adulthood (McAuliffe, 2006; see also Hoare, 2006b).

Conceptual Difficulties in Using the Concepts of Relativism and Dialectical Thinking

Some critical objections are necessary in relation to the of use philosophical concepts as a part of psychological nomenclature. Using the terms relativism and dialectical thinking is a problematic issue and is highly dependent on which philosophical tradition one comes from. The fields of psychology and philosophy have to be differentiated more clearly and distinctly.

As a concept, the term relativism has many different meanings, and it is not always clear to which meaning the reference is being made in current psychological research. The term relativism refers to a philosophical assumption that there are no universal truths (Pojman, 1999), or, in lay terms, 'anything goes'. Philosophically, two main types of relativism exist: cognitive and ethical, the first of which is of importance here.2 In cognitive relativism, knowledge, thinking, or the justification of knowledge claims, are considered to be relative. In some models of post-formal relativistic-dialectical thinking, as is the case with Commons' model, which focuses on causal reasoning, relativism is implicit: one has to compare and evaluate parallel causal-formal

[2] According to ethical relativism, there are no universal ethical principles but they are dependent on the context, such as culture and history (Pojman, 1999).

systems with each other. Thus, the separate causal models are relative in comparison to each other, until confusion is overcome by creating an innovative new model, a meta-system. Similar relativism is assumed to exist in further development after meta-systematic thinking, as in the case between competitive paradigms, solved in cross-paradigmatic theory (Commons & Bresette, 2006). In other models, as in Labouvie-Vief's (1994), different intra-psychological domains are seen to be parallel and equal ways of forming and acquiring knowledge (as intuitive feelings and logical thinking), and they are, thus, relative forms of knowledge.

An important question remains: from which standpoint are knowledge and thinking relativized in adult reasoning models; from a logical, subjective, or socio-cultural viewpoint? In addition, it has to be noted that these standpoints are not exclusive to each other (Pojman, 1999). Commons' GST model focuses on the causal thinking domain, and reasoning is relativized from a logical standpoint with other concurrent models aiming to explain the same phenomenon. The other post-formal thinking models have gone beyond causal reasoning. In Labouvie-Vief's model (Labouvie-Vief & Diehl, 2000) relativism is understood as co-existing in different forms of 'logic': the logic of emotion and volition and the logic of intellect, which may differ from each other. Relativism is, here, seen from a subjective standpoint.

Close to the aforementioned way of analysing relativism is Leadbeater's (1986) differentiation of the three possible versions of relativism: subjective (individualistic), objective (paradigmatic), and conceptual (ideological). In subjective relativism, truth is relative to the individual, and in objective relativism it is relative to the immediate context in which the claim is made. In conceptual relativism, reference is made in the

wider context and milieu of history, culture, or ideology. Leadbeater concludes that these distinctions have to be analysed more carefully in the models of adult relativistic-dialectical models. For example, Labouvie-Vief is a proponent of subjective-individualistic relativism, and Perry of objective-paradigmatic relativism (Leadbeater, 1986). Nowadays there are numerous models of post-formal relativistic-thinking, and also models of close domains of wisdom and epistemic understanding. The sense in which the term relativism is used in these models is problematic, because they lack philosophical analysis of the assumptions and the terms are used as a 'given'. Possibly the only exception is Kramer's (1983) analysis, which includes theoretical analysis of the philosophical assumptions of post-formal models. (Another exception is Basseches (2005) in regards to the question of dialectical thinking, see below).

There are similar conceptual problems with the term dialectical thinking in post-formal models. The word *dialektikos* comes from the Greek word "to argue"; it has historically been a form of argumentation through question and answer (Yan & Arlin, 1999). It has been noted that the term has been used in various contexts and meanings throughout the course of history; there is no one general meaning. The word was created in the ancient Greek philosophical schools, and one of the first to use it was Zeno of Elea. Philosopher Heraclitos has also been named amongst the first dialecticians. They claimed that opposites are the essential nature of reality and that there is a unity of opposites. As everything is existent and non-existent at the same time, polarities are interdependent on each other.

The term dialectical reappears again in the philosophical works of Hegel (1979) and Marx (2000). It is in the works of these philosophers that the term comes to refer to

the scheme of thesis-antithesis-synthesis as a metaphysical ontological process schema. In the Hegelian sense, there is a presupposition of idealistic monism, which is based on the movement and change of contradictory elements, and lastly on forming unity as synthesis. History is a teleological, dialectical process of ideas. Almost as an antithesis, it was Marx who assumed that matter rather than ideas are the core and base of reality. Matter is in a constant process of change and exists in contradiction at all levels of reality, for example, between the economic classes in the form of a class struggle. In other words, the issue here is one of two forms of dialecticism – idealistic and materialistic – between which there are major differences, such as how the concept of 'whole' is understood (Reese, 1982). There is also another kind of dialecticism beside the ontological – namely the epistemological – that is a method of reasoning through oppositional arguments (Baxter & Montgomery, 1996). Reese (1982) has commented on the aforementioned puzzling definition problem : "The term *dialectics* is often used nowadays as though it had only one 'correct' modern understanding, or one true meaning [but] the term has multiple meanings" (p. 423).

Whether or not the theorists of post-formal thinking are aware of the multiplicity of meanings of the term is up for question. One exception to this is Basseches (2005), who has clearly defined the way in which he uses the term dialectical in his model of post-formal thinking. He states that the model is based on the post-Hegelian (not pre-Hegelian) concept of dialectics, and he differentiates between epistemological and ontological dialecticism. It has to be noted that, in the field of epistemic understanding research, the term used instead of dialectical thinking is *evaluative thinking*, which is a psychological one (Kuhn & Weinstock, 2002). In this way, the conceptual problems

connected to the term dialecticism are avoided. In the research of wisdom, however, the terms relativistic-dialectical and post-formal thinking are used as concepts referring to the cognitive component of wisdom and, in this way, are tied to the philosophical problems previously mentioned.

Even if these questions are answered, the nagging conceptual question remains; is it possible to classify three alternative philosophical assumption systems (absolutism, relativism, dialecticism) as a hierarchy-like succession, developmentally linked to each other in a definitive order? Dialectical thinking has been classified as the highest level, stage, or phase in cognitive development, absolutism the lowest, and relativism somewhere in between (Basseches, 2005; Kramer, 1983; Sinnott, 1998). A hierarchy such as this is value-laden, from the lowest to the highest. Here, it would be reasonable to ask whether or not dialectical thinking is a more advanced way of thinking than absolutistic or relativistic thinking. Philosophical assumption systems are parallel possibilities of perceiving reality. Different systems of thought are alternative and equal viewpoints. All philosophical points of view or positions are equally valid, which is the basic premise of the Western civilization and free society.

Attention must be drawn to one important critical point. Most commonly, ill-defined, open system tasks and questions have been used in measuring adult cognition – either post-formal or relativistic-dialectical – and epistemic understanding or wisdom's cognitive components. Wood (1983) has demonstrated that ill-structured tasks may have different problem structures and, hence, are not directly comparable to each other in this perspective. Consequently, there is also a need to analyse and clarify the tasks used in measuring the aforementioned abilities.

There is one further critical point to add. In this case, the argumentation is not conceptual but empirical, and comes from the study of epistemic understanding and wisdom. It is not evident whether the aforementioned higher thought forms can justifiably be claimed to be those emerging as late as in adulthood (as is commonly claimed in regards to post-formal thinking: a question of a new developmental stage in adulthood, e.g. Commons et al., 1982; Sinnott, 1998). For example, Baltes and Staudinger show that the first signs of wisdom already appear during the high school years (Baltes & Staudinger, 2000; Kramer, 2003). A puzzling question regarding the relationship between age and epistemic belief development has also been discussed by Hallett, Chandler, and Krettenauer (2002), with results indicating that the first signs of epistemic development can be found during earlier development than adulthood. These results indicate that it may be incorrect to define the forms of cognition under discussion as a mature intellectual capacity. According to an alternative interpretation, it may be a continuous, gradual progression during the lifespan (see also Hofer & Pintrich, 2002).

One may argue that the concept of post-formal thinking is reasonable for the sake of the different logic used beyond formal operations. For example, Basseches (2005) and Sinnott (1998) have proposed that what is at stake is a question of new logic in adulthood. To claim that contradiction is the most distinctive form of adult thought is a common claim among scholars in the field.

It is not possible to solve socio-emotional, ill-defined problems with binary, right-or-wrong logic, which thus demands the use of post-formal thinking (Basseches, 2005; Sinnott, 1998). The focus of Piaget's theory is, however, on the hierarchical development of binary operations and causal thinking, not on the other forms of thought. Alternatively,

as Basseches (2005, p. 51) puts it: “Formal operational thinking as described by Piaget can be understood as efforts at comprehension that rely on the application of a model of a closed system of lawful relationships to the phenomenal world.” As an advocate of dialectical thinking, Basseches points out that there are two different approaches to reality and knowledge: formalistic and dialectical. Any phenomenon can be described and understood with both approaches. Basseches goes on to claim, however, that dialectical thinking is that which makes it possible to overcome the limitations of formalistic logic. Formal closed systems are not adequate for problems focus analyzing multiple and open systems. He, as almost all theorists of post-formal thinking, has also argued that dialectical thinking is a post-formal level of development (2005, p. 58). Moreover, it is stated that formal thinking is, therefore, a prerequisite for dialectical thinking.

If it is claimed that post-formal thinking is a new stage after formal thinking, as a continuation of progress in development, a serious flaw emerges: the object of study is not the same as in Piaget’s original theory. The focus of study has changed from well-defined binary problem-logic to ill-defined logic, which may even be called a *category error* in philosophical terms (Ryle, 1949). The phenomenon under study is not the same, as they are categorically different.

Riegel, the first advocate of dialectical post-formal stage (1975, p. 62), states: “examples […] confirm that a dialectical interpretation of early development is possible,” but at the same time states that it is question of a new stage after formal operations in adulthood. If contradictory, open-system and ill-defined problem-based thinking is already possible in some forms in earlier development, why is it necessary to suppose it

also to be the stage after formal operations? It seems more reasonable to assume two separate lines (causal and dialectical) of development parallel to each other, a matter which definitely needs further clarification.

It has been shown that there are many theoretical and empirical difficulties in using the terms post-formal relativistic-dialectical thinking, as well as in the closely related concepts of wisdom and epistemic understanding. All of the three fields of study are in a diffuse state, and there are some major theoretical questions that have not been resolved or thoroughly analysed.

Integrative Ability: the Core Component?

There are two possible ways of trying to solve the dilemma of the diffuse nomenclature of research within the field. Firstly, the simplest way to redefine it is as a study of the *development of adult thinking skills.* This is the simplest solution, if one keeps the focus on the qualitative changes of cognition during the lifespan, and especially in adulthood.

If there is a need to specify the field or the specific domain of cognition under study, there is one apt candidate available. The most descriptive term for naming the field of study could simply be the term *integrative thinking*. What follows is a further analysis of the concept. The term integration comes from the Latin term *integrationem*. This refers to the restoration of wholeness and has a sense of renewal, the whole being more than its parts (Rosch, 1998). In the earlier discussion of post-formal thinking, integration has been defined in the following way:

> "Integration [is] a synthetic form of thinking … that integrates several opposing systems into an abstract whole that contains all particulars" (Alexander & Langer, 1990, p. 27).

The integration of mental actions is possible in various domains in different post-formal models; namely logical, intra-psychological or inter-social ones. In the logical domain, Commons and his group (Commons & Bresette, 2006) have explicitly stated that coordinating and integrating lower-level systems lead to a new, higher and more complex form of logical thinking. In Labouvie-Vief's model (1994), intra-psychological integration is claimed to exist as the integration of emotion, cognition, and will (see also Pascual-Leone, 1990). The concept of integration is also used in the field of the development of epistemic understanding, as in the coordination of the different sources of knowledge, as expert knowledge and one's subjective experiences (Limon, 2006), and several subcomponents of the psyche are integrated (e.g. emotion, thinking, and conation) in wise action (Yang, 2008).

As a term, 'integrative thinking' is not a new innovation. It has also been used in some other scientific disciplines; for example, in the fields of nursing science (Westra & Rodgers, 1991), medicine (Rosch, 1998), economics (Benson & Dresdow, 2009), psychotherapy (Dryden, 1992), interdisciplinary studies (Sill, 1996), education (McLoughlin & Mynard, 2009), and educational psychology (Dixon, 2008). As an example of how integration is used in other disciplines, Westra and Rodgers (1991) have analysed the concept of integration in the field of nursing. They found that the concept of integration was used to refer "to a process of combination in which two or more elements are merged into a new entity" (p. 278). The interaction of the elements is crucial here, and the components found in this process are combination, interaction, and unity.

Several expressions come close to the term integration, and terms such as add, connect, merge, bond, unite, fuse, link, associate, mix, combine, coordinate, synthesize, or create might possibly be used instead. In what sense is integration used in the research on adult cognition? One possible naïve hypothesis is that integration merely links or associates particles together. Adding things together is more of a mechanical action. Whichever definition of integrative thinking is used, it seems to mean something more than purely mechanically combining things together. There seems to be some further factor that must be included in cognition for it to warrant the term as integration. Integration seen as mechanistic linking can be called *additive integration*. It is also reasonable to claim that things in this case are united, associated, or connected together without any profound qualitative change.

The term *integrationem* presupposes renewal and something that has not existed before it is born. The term synthesis is often used synonymously with ways of thinking in which elements are integrated. In a synthesis, lower-level objects are formulated in a new way and steps are taken to create something new from them. Integration, in which the synthesis of elements is included, can be called *transformational integration*. The models of post-formal relativistic-dialectical thinking, as well as the models of wisdom and epistemic understanding, definitely have this kind of key element included in them. This is due to the presupposition that the act of integrating lower-level elements with new ones includes developmental progress and change.

Conclusions

To summarize, there seems to be a chaotic profusion of models that try to describe adult cognition, although their common features have been acknowledged in various analyses. The post-formal relativistic-dialectical models have gained considerable attention and acceptance in psychological literature during recent decades.

Several counter-arguments for using the terms post-formal relativistic-dialectical thinking have been shown to exist. The conceptual problems described are briefly: (a) the imprecise way of showing from which viewpoint relativism is seen; (b) in the case of dialectical thinking, clarification has to be made regarding the tradition (idealistic vs. materialistic, pre-Hegelian vs. post-Hegelian, also differentiation between epistemological vs. ontological dialecticism); (c) the question of a hierarchical vs. non-hierarchical assumption of philosophical belief systems (as in the case of absolutism, relativism, and dialecticism); (d) possibly different internal structures of ill-defined problems used in measuring within the field, and (e) confusion about whether it is really solely a question of adult development or of life-span development, too.

The terms relativism and dialectical thinking are obviously philosophical concepts, but their use has also spread in psychological descriptions of cognition. In a very strict sense, the terms relativism and dialectical thinking are not appropriate for describing cognitive development in psychology. In this analysis, two other major psychological-educational traditions have been taken into account; namely epistemic understanding and wisdom, which claim that there is inter-connectedness between them

and post-formal thinking. In conclusion , the same critique is, thus, also applicable to these traditions, due to the same reasons.

It is important to clarify the nomenclature of the cognitive component shared in these models. This article suggests that the most apt candidate as a common factor would be the term ‘integrative thinking’. Specifically, integration is understood as a transformative quality, because it is a question of developmental phenomenon. Under the rubric of integrative thinking, it is possible to specify the domain(s), in which the aforementioned developmental forms of cognition manifest themselves, as, for example, epistemic, logical/causal. or socio-cognitive ones.

Hence, the nomenclature will be simpler and unified in this way, and the confusion in the field may be avoided. By using the term integrative thinking, one avoids the use of the debatable, un-clarified terms. Indeed, under the umbrella of integrative thinking, various models could be brought together as a totality. From a philosophical standpoint, the term is neutral. It is merely a concept that can be used in empirical psychological research without problematic connections to complex philosophical theories.

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