

# On Operationalizing Aspects of Altitude

## AN INTRODUCTION TO THE LECTICAL™ ASSESSMENT SYSTEM FOR INTEGRAL RESEARCHERS

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The goal of this article is to introduce Integral researchers to the Lectical™ Assessment System (LAS). The LAS is a domain general measure of development that can be used to create a variety of psychographs as part of a unified methodological approach. In an introductory theoretical discussion, we situate the LAS within the Integral model, suggesting that it operationalizes key aspects of the construct of altitude. After a discussion of ideas from the history of developmental structuralism, we introduce the basic components of the LAS. We then address the validity of the LAS, summarizing the results of psychometric validity tests and comparisons to other developmental assessment systems. Finally, we demonstrate how to use the LAS to build a variety of psychographs, and then close with some reflections on what the LAS has to offer in the context of Integral research and practice.

### Introduction

Roughly a century ago, James Mark Baldwin first glimpsed the possibility of a thoroughgoing developmental and integral psychology.<sup>1</sup> Since that time, a science has been built. A lineage stretches from Baldwin through Piaget and Kohlberg to Case and Fischer. Adding other names to the list is easy. Important theoretical or empirical contributors include Armon, Commons, Damon, Turiel, Kegan, and Pascual-Leone. The tradition of cognitive developmental research and theory is as impressive as any.

This article is an introduction to a contemporary developmental assessment system that is indebted to this tradition. The article gives a brief overview of the methodology and research associated with the Lectical™ Assessment System (LAS), which is a *domain general* measure of development.<sup>2</sup> In essence, we claim that the LAS operationalizes certain key aspects of Wilber's construct of *altitude*, or a common metric according to which various lines or domains of psychological development can be aligned.<sup>3</sup> When the LAS is coupled with specific analytical accoutrements, it is capable of generating various types of psychographs via a unified methodological approach. The LAS uses *one method* to assess development in *many lines*.

This may seem a grand claim. However, by contextualizing the LAS within the Integral model, it will become clear that what we claim for the LAS is actually very specific.<sup>4</sup> It is a *ruler* that can be used to measure development in any domain that people speak or write about—which includes most (but not all) of the *lines* frequently mentioned in the Integral model. From here on out, keep in mind that the LAS can measure only those lines and levels that are *linguistically mediated*. The importance of this limitation will be elaborated later. We begin with an introductory theoretical discussion to situate the LAS within the Integral model, with a particular focus on the construct of altitude. We ask: to what extent can this construct be methodologically operationalized? To answer this, we look at some key ideas in the history of developmental structuralism, concluding that the LAS indeed operationalizes one key aspect of altitude,

*hierarchical complexity*. Along the way, we address the concern that the LAS might be, in effect, a form of *line absolutism*, e.g., that it is insensitive to context and domain specificity. We will see that this is not the case, because the LAS, like a ruler, is a metric devoid of content.

Following this theoretical discussion, we introduce the basic components of the LAS. Examining the *practice* and *method* of developmental assessment, we demonstrate that there are a variety of intuitively feasible ways to assess development. The LAS hones in on the most *general properties indicative of development*, which are those that have been refined in light of a century of cognitive developmental research. We also present descriptions of the levels specified by the LAS and how these line up with the levels specified by other developmental assessment systems.

After this whirlwind introduction to the LAS, we briefly present the results of extensive research efforts. First, we address concerns about the *validity* of the LAS, summarizing the results of psychometric validity tests and comparisons to other developmental assessment systems. Then we address issues of *utility*. As an example of what the LAS can do, we demonstrate how it can be used to build a variety of psychographs. Finally, we close with some reflections on what the LAS has to offer in the context of Integral research and practice.

## **The Integral Model: A Summary**

The great American philosopher Wilfrid Sellars once said that "the aim of philosophy, abstractly formulated, is to understand how things in the broadest possible sense of the term hang together in the broadest possible sense of the term."<sup>5</sup> Half a century earlier, another great American philosopher, C. S. Peirce, viewed philosophy in a similar manner.<sup>6</sup> With a nod to Kant, Peirce suggested that philosophy ought to proceed architectonically, i.e., with the goal of system building. Specifically, it ought to be concerned about *the principled classification of the sciences*. Few philosophers take up this task and, of those that do, fewer still meet with a general consensus concerning their model. The work of Ken Wilber is unique in this regard.<sup>7</sup> Decades of scholarship, research, and debate have yielded a philosophical orientation and a concomitant meta-disciplinary model, dubbed "Integral" because of its comprehensiveness. The approach is unrivaled in terms of its relevance, feasibility, and sophistication. The main features of this Integral model are presented below in terms amenable to the psychological discussions that are to follow.

The most general contours of the Integral model are very simple, hence the acronym "AQAL." This stands for "all-quadrants, all-levels" (and implies "all-lines, all-states, and all-types"). Without getting into too much detail, we will proceed to cover the most basic components, including the model's more complex face: Integral Methodological Pluralism (IMP). In essence, the Integral model is based on a kind of meta-philosophical position, like the two mentioned above, which is that we *ought* to try to build a framework that can encompass the most truths and insights from the most disciplines and endeavors, getting them all under one roof. This requires laying out certain highly abstract *orienting generalizations*.<sup>8</sup> These generalizations subsume, categorize, and differentiate an enormous variety of methods and findings. What follows is only a rough sense of the key parts of the Integral model.

The *quadrants* are basic. They represent the most general categories or divisions evident in human knowledge. To label the *quadrants* as *categories* is, technically speaking, to frame them in terms of an indelible philosophical ambition. From Aristotle through Kant and Hegel down to Peirce and Sellars, there was a project aimed at searching out the most *primordial distinctions* in terms of which to classify objects and forms of knowledge. Peirce, following Kant, marked a turn in this tradition, by looking for these categories in the implicit structures of methodologies and languages. Early on, he hit upon the idea that the categories should be aligned with the system of basic pronouns: “I,” “We,” and “It.”<sup>9</sup> This insight, as followed up more recently by Habermas, points to the heart of our everyday language use and suggests a set of “worlds,” each with unique and irreducible properties: the subjective world, the intersubjective world, and the objective world.<sup>10</sup> This three-fold distinction, refined in terms of linguistic analysis, ends up retrofitting a variety of perennial notions about certain great divisions in human knowledge, such as the Beautiful, the Good, the True; Art, Morals, Science; self, culture, nature.

Wilber notes that this set of “worlds” is really a system of perspectives or stances that can be taken up, including first-person, second-person, and third-person perspectives. The four-quadrant model brings these pieces together by graphically representing *the interiors and exteriors of individuals and collectives* (see figure 1).

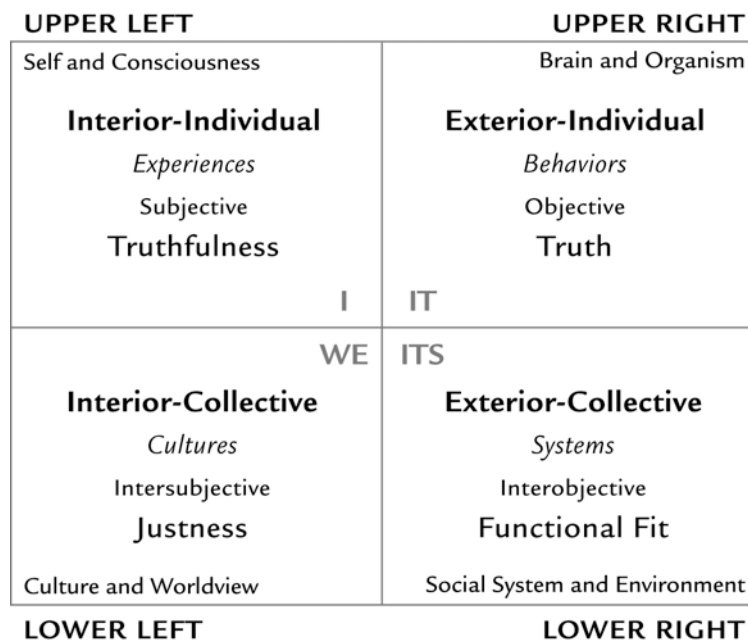


Figure 1. The Four Quadrants

Furthermore, Wilber suggests that if we think in a more complex way about the nature of these perspectives, we can scaffold *a principled classification of inquiry types*.<sup>11</sup> Integral Methodological Pluralism (IMP) is a further refinement of the category system outlined in the four quadrants. Through a more detailed analysis of the perspectives that yielded the four quadrants, Wilber derives a system of eight primordial perspectives, each with a concomitant methodological approach and domain of phenomena. The result is a taxonomy of methodologies

couched in terms of irreducible perspectival differentiations. We now have a graphical representation distinguishing *the insides and outsides of the interiors and exteriors of individuals and collectives* (see figure 2). Needless to say, this is a mouthful. The fundamental insight here is that there are a limited number of families of methodologies, and these can be arranged and differentiated in a principled fashion; that is, in terms of an analytically deduced system of basic perspectives.

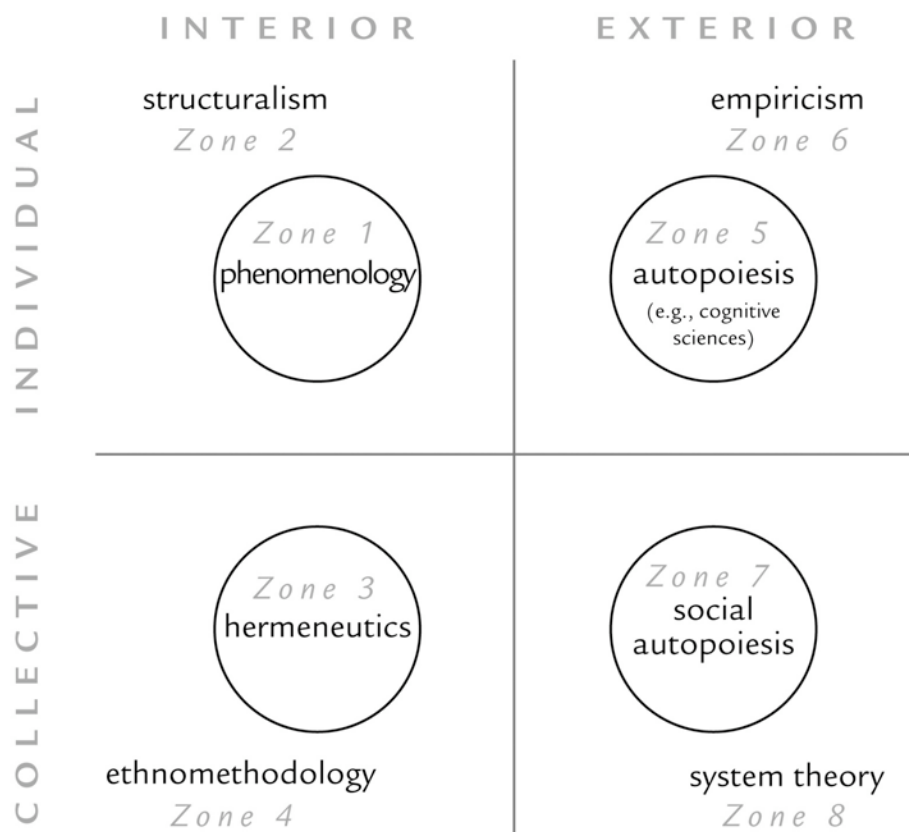


Figure 2. Eight Methodologies within the Quadrants, or Integral Methodological Pluralism (IMP)

Each *unique* and *irreducible* perspective discloses a horizon of phenomena, known as a *zone*. Each zone is, in effect, the condition for the possibility of a certain family of methodologies. Quickly, the eight zones and their related methodological approaches:

- Zone #1: Upper-Left quadrant: the inside of the interior of individuals: Phenomenology
- Zone #2: Upper-Left quadrant: the outside of the interior of individuals: Structuralism
- Zone #3: Lower-Left quadrant: the inside of the interior of collectives: Hermeneutics

- Zone #4: Lower-Left quadrant: the outside of the interior of collectives: Ethnomethodology
- Zone #5: Upper-Right quadrant: the inside of the exterior of individuals: Autopoiesis (e.g., cognitive science)
- Zone #6: Upper-Right quadrant: the outside of the exterior of individuals: Empiricism (e.g., neurophysiology)
- Zone #7: Lower-Right quadrant: the inside of the exterior of collectives: Social Autopoiesis
- Zone #8: Lower-Right quadrant: the outside of the exterior of collectives: Systems Theory

So that is the view of the whole. Now we will explain the other components of the model as they bear on psychology. We will be looking at the Upper-Left quadrant to discuss types, states, lines, and levels. All these also signify phenomena that occur in the other quadrants, e.g., types of social systems, levels in the development of cultures, etc. But our discussion will focus on the Upper Left in order to frame a more detailed discussion of one of the key zone-#2 issues: the relation between levels, lines, and the construct of altitude. This will set the stage for an introduction of the Letical™ Assessment System by clarifying what it means to *methodologically operationalize aspects of altitude*.

Types, states, lines, and levels can be easily grasped in terms of certain specific traditions in psychology. Briefly, the longest standing findings regarding types are those regarding the introversion/extroversion typology. Types are basically classifications of stable dispositions: personality types, masculine/feminine types, etc. As for states, there is a tradition in Western psychological research dating to the days of William James aimed at investigating states of consciousness, such as those that are induced via intoxication or meditation. States are transient alterations of feeling, mood, and capability. Importantly, states and types do not develop (although practitioners of meditation can develop their own capacity to access various states). For this reason, they are tangential to the purposes of this article. We can do developmental psychology and never really have to deal with these phenomena. What the Integral model suggests is *not* that we who research development should research states and types too, but rather that if we ever want to claim to have a comprehensive psychological model we cannot leave them out. Now, lines and levels, on the other hand, are at the very heart of this article, because they are the primary phenomena developmental psychologists are aiming to explain.

Lines are relatively independent forms of psychological functioning—reflecting both different ways of thinking and the different things we think about. Many readers may be familiar with Howard Gardner’s notion of multiple intelligences, which is a well-known example of something like lines (although the difference between lines and Gardner’s notion of intelligences is certainly a worthy topic of a separate article!). As Wilber’s extensive scholarship revealed, researchers have proposed upwards of a dozen distinct lines of development.<sup>12</sup> Consider the differences between moral reasoning and reasoning about the physical world. It is easy to imagine, and

research has confirmed, that someone advanced in their thinking about physics would not necessarily be advanced regarding issues of morality. These are distinct domains, different lines along which thought, action, and behavior develop. Understanding lines gets us part of the way towards understanding the *differential distribution of capabilities within persons*. As we will see, the idea that there are relatively distinct lines of development is a venerable one in the tradition of developmental psychology, and it is right at the heart of what this article is about.

A challenge in the study of lines lies in specifying exactly what they are, how to define them, and how many there are. It is reasonable to assume that to some extent they may reflect the evolved capacities of our brain and mind—we can cognize to solve problems, we can navigate our bodies in space, we can recognize emotions on the faces of conspecifics. But it is also reasonable to assume that lines reflect more the culture, tools, and domains humans have developed during the course of history—our music, poetry, morality, science, organizations, and so on. The stance we take in this article is the latter. We suggest that there are as many lines as there are types of things to understand. This covers many, if not most, of the lines commonly referred to in the Integral model. This definition will be expanded when we get to Fischer’s skill theory in the next section.

We cannot really understand lines without understanding levels. Levels are developmental milestones in the unfolding of particular lines. These developmental milestones have had various names: stages, levels, orders. But the common denominator is that lines develop in terms of a specifiable, and often invariant, sequence or hierarchical unfolding. With the notion of an Integral Psychograph (see figure 3) Wilber is attempting to graphically depict an individual’s developmental unfolding in a number of lines. A psychograph is a graphical representation of the *differential distribution of capabilities within persons* in terms of levels and lines. This person, for example, is more highly developed in mathematical capacity than musical capacity. Now, notice the y-axis of the psychograph, because that is what we are talking about next.

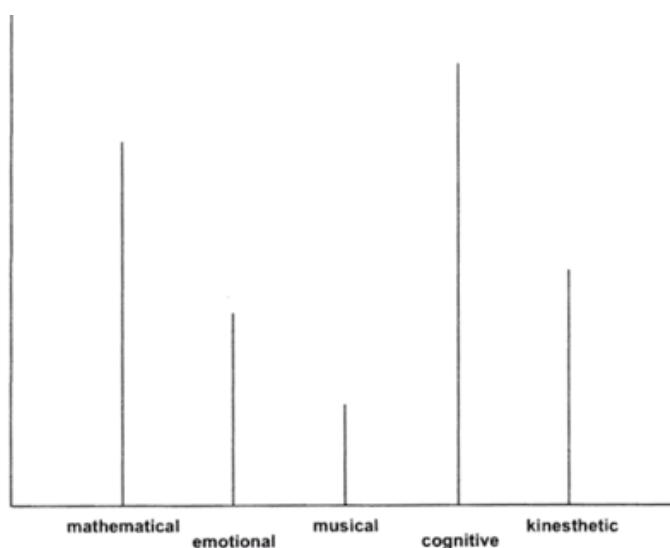


Figure 3. A Simple Psychograph

## Laying Bare the Core of Zone #2: Operationalizing Aspects of Altitude

The situation is this: given a number of developmental approaches, each dealing with ostensibly unique domains (i.e., lines) of development, how can they all be subsumed in a unified picture of development? That is, what is common across all these approaches that would facilitate *bringing them all together* while respecting their *very real differences*? What is abstract enough to frame this kind of unity in diversity? In answering this question, Wilber posits a construct that can be found even in his earliest writings: all the models make implicit reference to *a common developmental space*.<sup>13</sup> This gives us a picture of *many lines of development moving through one common space*, or *a universal developmental characteristic instantiated in particular domains*. This construct emerges front and center in Wilber's most recent writings, where it is explicated as *altitude*.<sup>14</sup> As Wilber puts it (it is worth quoting at length since he precisely defines the issue here):

So the dozen or so different developmental lines are indeed different, as you might expect and as research confirms. But what is so striking is this: place the developmental models and lines next to each other, as in the psychograph, and all the lines seem to be growing in the same direction, which might be described as increasing complexity (to put it in 3-p terms) and increasing consciousness (to put it in 1-p terms). But what is the actual gradient here? *What is the vertical or y-axis in the psychograph?*

In other words, is there one yardstick that can be used to measure the height of all the developmental lines? That has been the great puzzle to developmentalists for the last several decades.

There are two theories available that attempt to explain this, and AQAL uses them both. One theory, accepted by most developmentalists, is that the basic yardstick is the cognitive line, because alone of all the lines, there does seem to be a mechanism relating it to the others. Namely, research has continued to demonstrate that growth in the cognitive line is necessary but not sufficient for the growth of the other lines.... The other theory...is that the y-axis is consciousness per se.... In this view, all of the developmental lines move though the same altitude gradient—and that gradient is consciousness, which is the y-axis, or the "height" of any of the lines on the psychograph.... All of the lines can then indeed be aligned in the same psychograph, moving through the same altitude gradient (*as well as* moving through their own specific structures or stages, which still remain apples and oranges in that regard and cannot be reduced to each other—as, e.g., cognition cannot be reduced to values, or vice versa).<sup>15</sup>

The notion that there may be *one yardstick* or *ruler* that could be used to measure development in any line or domain is an important one. As an *orienting generalization*, it serves to organize and align the various existing developmental assessment systems. Like many of the other orienting generalizations that make up the Integral Model, altitude serves as a kind of *regulative ideal*, setting a trajectory for research and theory. Thus it is not an empirical concept; it is a meta-methodological concept that serves a *normative function*. Only if we posit that there is indeed

*one yardstick* (e.g., the y-axis of the psychograph) can we can move towards aligning different models and measures of development in a unitary developmental space. However, the concept of altitude fosters Integral Research by remaining *beyond* the specifics of individual models. Therefore, in principle, one cannot get a hold of and operationalize altitude, per se. At best, we can operationalize certain *aspects* of altitude. This is what the LAS claims to do. Specifically, the LAS claims to measure a certain *set of lines* within a limited *developmental range*. The scope of language determines the boundaries of this set and range, because the LAS assesses development by honing in on certain properties of altitude as manifest in linguistic performances.<sup>16</sup>

However, there are several theoretical issues that need to be squared away before we can claim to have operationalized these aspects of altitude. There is a delicate and important theoretical issue here. Wilber aptly notes the issue in Excerpt D from Vol. 2, where, after giving an overview of levels and lines and drawing attention to the psychograph, he says:

One thing we particularly cannot do is use the way the "levels" are formulated in one line to refer to the "levels" in the other lines. (This stream absolutism is as common as it is theoretically problematic.)... For example, terms that are used in the moral line include "pre-conventional," "conventional," and "post-conventional"... But, strictly speaking, you cannot use those terms to refer to the cognitive line (or any other line), because formal operational thought, for example, can adopt several different levels of morals. A person can be at the formal operational level of cognition yet be at moral stage 1, moral stage 2, or moral stage 3. Thus, somebody using formal rationality can in fact have a pre-conventional moral sense (e.g. Nazi doctor), a conventional moral sense (e.g., fundamentalist preacher), or a post-conventional moral sense (e.g. classical liberal), all of whom can be at the same cognitive level of development.

In other words, "levels/stages" are measures of something actually occurring in one of the lines; therefore, when those actual occurrences are formulated and some of their stages suggested, those stages necessarily are composed of the phenomena in those particular lines, and thus the very terms of the stages themselves (and their proposed deep structures) adequately fit only the particular line or stream of which they are measures.<sup>17</sup>

So, on the one hand we have the idea of altitude as a metric based on *something common* across all lines. Yet, on the other hand we have a clear warning against *line absolutism*, e.g., generalizing the stage-like properties from one line to others. The real tension arises because, as Wilber notes in the first quote, many developmentalists have thought that the cognitive line can, in some way, serve as a proxy for altitude. But how can this way of construing the cognitive line be reconciled with the obvious errors of line absolutism? The answer lies at the end of the first quote:

All of the lines can...indeed be aligned in the same psychograph, moving through the same altitude gradient (*as well as* moving through their own specific structures or stages, which still remain apples and oranges in that regard and cannot be reduced to each other....

The LAS defines and clarifies important aspects of this *altitude gradient*. A brief look at some important ideas in the tradition of developmental structuralism will clarify this matter.

### **A Century of Ideas about What Is Domain Specific and What Is Domain General**

James Mark Baldwin is undoubtedly the place to begin.<sup>18</sup> His monumental theoretical edifice, still neglected by most psychologists, suggests that certain relatively independent *modes of thought* progress through certain relatively universal *stages of growth*. The different *modes* are defined epistemically in terms of their respective *coefficients of control*. The term *coefficient of control* is one of the many coined by Baldwin during his pioneering efforts; it signifies the relation of thought to the invariant properties of the world that constrain, check, and control it. So the coefficients of control marking the cognitive/scientific mode are the invariant features of the physical world, whereas the coefficients of control marking the social/ethical mode are the invariant features of the social world.<sup>19</sup> The universal stages of growth, through which the various modes pass, are defined in terms of a *developmental logic*. That is, there is a *universal process of growth* allowing each stage to be characterized in terms of increasing differentiation, integration, complexity, and abstraction. So, modes are defined in terms of *what they are about*, whereas stages are defined in terms of *properties indicative of growth* (e.g., degree of complexity, etc.).

Not coincidentally, Piaget outlined a similar model, but with some major differences. Most notably, Piaget suggested that *one* underlying structure could account for all developmental changes.<sup>20</sup> This makes Piaget's theory, especially as it is commonly portrayed in textbooks and introductory psychology classes, perhaps *the* best example of line absolutism. Of course, his theory is more nuanced than most think. Interestingly, the process of *hierarchical integration*, also called *reflecting abstraction*, came to dominate Piaget's thinking towards the end.<sup>21</sup> Hierarchical integration is a *universal process applied to particular content*, and it is best characterized, again, in terms of increasing differentiation, integration, complexity, and abstraction. This idea allowed Piaget to make sense of a great deal of experimental data regarding micro-developmental phenomena in a number of domains.<sup>22</sup> That is, in various experimental situations, despite differences in the content of what was being thought about, developmental changes displayed a consistent pattern (e.g., increasing differentiation and integration). This idea appears again and again in his work.<sup>23</sup>

Around the same time, Heinz Werner, setting out with none of Piaget's substantive theoretical assumptions, observed the same thing.<sup>24</sup> He labeled it the *orthogenetic principle*. In light of research in a variety of different areas, including visual perception and mental illness, he saw that there was "one regulative principle of development...that wherever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchical integration."<sup>25</sup>

Roughly a decade later, Lawrence Kohlberg, brought all the pieces together in his influential essay, "Stage and Sequence."<sup>26</sup> Here Kohlberg summarized the tradition of which he considered himself a part. He codified the implicit commitments of this theoretical orientation, suggesting that those taking up a cognitive developmental approach employ three analytical lenses when investigating a cognitive-stage sequence: "(1) analyses of universal features of experienced objects (physical or social), (2) analysis of logical sequences of differentiation and integration in

concepts of such objects, and (3) analysis of structural relations between experience-inputs and the relevant behavior organizations.”<sup>27</sup> In these points, we see the initial suggestions of Baldwin. The objects of thought (i.e., 1), and how these objects affect the structural organization of behavioral responses (i.e., 3) can, and should, be seen as relatively distinct from the properties of concepts and sequences that are indicative of development, such as the degree of differentiation and integration (i.e., 2). Kohlberg understood his own work in the moral domain as taking up this kind of approach. Moral reasoning is distinct from, say, reasoning about the physical world; they reference different “worlds” and thus organize behavior along different lines. Nevertheless, there is something common between the two, such as certain very general properties of conceptual sequences.

Kohlberg had more to say about moral reasoning than about these domain general properties. It was Kurt Fischer who took up the latter task.<sup>28</sup> *Dynamic skill theory* builds upon the history of developmental structuralism sketched above.<sup>29</sup> It also draws upon other seemingly disparate research traditions, including emotion, culture, brain science, dynamic systems modeling, and ethology. It bursts the boundaries of zone #2, involving methodologies from zones #3, #4, and #6. But for our purposes here, we will focus on some of Fischer's original insights regarding *domain general properties indicative of development*. These were first outlined in 1980 as *recursive structural dynamics constitutive of the hierarchical organization of skills*. The LAS is based directly and explicitly on Fischer's work, so it is worth elaborating at some length here just how he rearticulated some the key issues of developmental structuralism.

To start, the concept of a *dynamic skill* is already a domain general one. In this context, we can think of *lines* as clusters of related skills. For example, the moral domain includes a variety of related skills, ranging from perspective taking to considerations of context. Thus, skill theory entails a fine-grained differentiation of abilities, suggesting there are as many types of skills as there are types of tasks. Because different tasks make different demands—understanding the context of a specific euthanasia dilemma is different from taking the perspectives of those involved—different skills occur *within* the same domain or line. Moreover, skills are sensitive to situations, which means that solving a problem in one situation does not ensure its solution in another. So, the image is of a web, not a ladder. We have numerous and multifarious skills developing at different rates, some in clusters according to type, topic, or situation, others isolated, or radically under-exercised, etc. But despite this diversity, all skills must be built. They do not come out of nowhere; they are constructed according to a process of differentiation and integration, and display increasing degrees of abstraction and complexity. By this point in the story, this should come as no surprise.<sup>30</sup>

This gives us a new view, building on Baldwin, Piaget, and Kohlberg, of what it means to analyze and understand development. In Baldwin's language, each skill is marked by a unique coefficient of control determining its content, whereas the growth of each skill is marked by common properties indicative of development. Even though different skills are built out of and in relation to *different stuff*, they are built via comparable processes of differentiation and integration.

Following Fischer's work, Michael Commons codified the construct of *hierarchal complexity*.<sup>31</sup> This construct analytically clarifies just what it means for there to be *developmental levels*

characterized by increasing complexity, abstraction, differentiation, and integration. Specifically, Commons, like Fischer, focuses on the idea of *task analysis* and the hierarchical organization of behaviors necessarily entailed by specific task demands. For example, the task of making a hypothetical conditional statement, such as an if/then statement (e.g., If it is raining, then I will bring my umbrella), is more hierarchically complex than the task of stating a simple proposition (e.g., It is raining). This is because the former *subsumes* the latter, which is to say, with reference back to Piaget and Werner: hypothetical conditionals *hierarchically integrate* simple propositions. In this process, the demands of higher-level tasks and performances *transcend and include* the demands of lower-level ones.<sup>32</sup> By analyzing task demands and performances, we can determine how many sub-skills are transcended and included *within* the skill we are analyzing.

This kind of analysis, especially in the context of Fischer's skill theory, allows for fine-grained developmental assessments of very specific skills. Focusing on the hierarchical complexity of the *skill structure* allows us to do developmental analyses regardless of the *skill type*; that is, we can measure the hierarchical complexity of a performance in any skill domain, because we focus on the domain-general properties of its structure. Fischer has applied this type of skill analysis in a wide variety of domains including, mathematics, self-understanding, epistemological reasoning, and moral reasoning.<sup>33</sup> He has also demonstrated within-domain differences in skill by focusing on the effects of context on performance.<sup>34</sup> It was out of this substantive body of empirical work that the general notion of a developmental ruler first emerged. And so, Fischer, Dawson, and Commons acknowledged that they were honing in on the domain-general *shape of development*.<sup>35</sup>

So far, we have selectively reviewed some key ideas in the history of developmental structuralism in order to clarify the construct of altitude. As Wilber put it in the quote above, we can align various skills along a common metric, and yet still admit they are "apples and oranges" with regard to their content. Baldwin first hit upon this, and we traced a line from him through Piaget, Werner, and Kohlberg down to Fischer, where we found an image of multifarious skills, each defined in terms of content and context, any of which can be measured in terms of a *common metric*, e.g., the general properties of the skill's structure. The LAS is an explication of this *common metric* implicit in the various models.

There is an important distinction here between *metrics* and *models*. Metrics can function accurately with respect to certain phenomena irrespective of how those phenomena are modeled. A thermometer is a good example of a metric. It can accurately measure the heat of a variety of materials regardless of the fact that these materials became hot as a result of different chemical and physical processes. We explain heat in terms of different *models* in chemistry and physics. But we *measure* heat in terms of the same general propriety detected by the thermometer. The LAS is a metric in this sense. It measures certain properties indicative development, but it does not attempt to explain the underlying developmental process. In contrast, Fischer's dynamic skill theory would be an example of a model. Models and metrics are necessarily interrelated, but they should not be conflated. In this context, their conflation bears on issues of line absolutism.

Domain general models of development differ from domain general metrics. As noted above, Piaget was looking to explain all development in terms of a specific model (assimilation, accommodation, equilibration, etc.). This model is unabashedly logico-mathematical and thus

slides into line absolutism when it is broadened in attempts to explain development in domains not amenable to logical formalization. But metrics do not make substantive explanatory claims. Thus, in many respects, broadening the application of a metric is less problematic than broadening the application of a model. As we will see in more detail below, domain specific assessment systems conflate model and metric by characterizing development in domain-specific terms. This limits the application of their measurement techniques. The LAS takes a radically different analytical strategy and characterizes development in domain-general terms, i.e., in terms of hierarchical complexity, which allows for the broad applicability and usefulness of measurement techniques. Moreover, as noted above, this differentiation of model and metric relieves concerns about line absolutism.

### **Excursus: How Researchers Using the LAS Differentiate between Lines**

To strengthen our case we would like to offer a quick note on how we differentiate lines. Wilber notes that lines are "relatively independent" but gives little clue into how they are differentiated.<sup>36</sup> When he posits that each line is an answer to one of life's fundamental questions, he offers a common-sense approach to parsing lines.<sup>37</sup> In general, Wilber seems rather agnostic about the exact number or characteristics of lines, comfortable with numbering them at "over a dozen" and grouping categories as basic as "cognition," as specific as "altruism," and as idiosyncratic as "death-seizure" together.<sup>38</sup>

Contrast this with the tightly defined approach of Howard Gardner, whose "multiple intelligences" Wilber often claims are synonymous with lines.<sup>39</sup> Gardner defines eight intelligences using eight rigorous criteria.<sup>40</sup> He is attempting to figure out how the mind works, our underlying information processing capacities that operate to create value in our lives and our cultures. Most notably in contrast to Wilber, Gardner focuses solely on aspects of the intellect or cognition. For example, he notes that there is no moral, creative, or emotional intelligence; all of which are categorized as lines by Wilber. Instead, Gardner notes that many of his eight intelligences are called upon to make each moral, creative, or emotional decision or product, and that each intelligence can be mobilized in moral, creative, or emotional ways (or their opposite).

The approach of skill theory falls closer to Wilber's way of differentiating lines than Gardner's. Skill theory takes a more common-sense approach, positing that there are as many lines as there are things to do or topics to reason or talk about. Each specific task can be considered a skill. However, that is not to say that there are not clusters or hierarchies of skills. If a very specific skill, say moral reasoning about abortion, calls on other skills, such as the ability to speak and reason in general, then the more general skills subsumes the more specific skill. So there are hierarchies and clusters of skills, which can be parsed via *skill analysis*. This is a grounded empirical method aimed at dissecting any specific activity into its component skills.

Therefore, our approach for creating psychographs involves making targeted distinctions between skills based on the particular requirements of the assessment. For example, if someone is interested in creating a "leadership" psychograph, then we break down the abstract concept of leadership into its component tasks and skills. For example, the task of setting strategic direction for the company requires decision making skills, while the task of hiring team members requires the skill of reasoning about leadership capacity. Each of these skills can then be measured using

the LAS. This aligns the different skills along the same developmental continuum (see figure 8 later in the article for a graphical representation of such a psychograph).

If a person is instead interested in a general psychograph that covers the "big questions" of human life, we follow a similar process. For example, the LAS could assess many of the lines listed in Wilber's chart in *Integral Spirituality*, although it would require some research to determine the component skills.<sup>41</sup> For example, cognition is too broad to measure in any meaningful way (at least using a developmental approach; a general intelligence test may be meaningful to some). So, the first step would be to figure out a task that taps into the vague construct of "cognition" in a meaningful way. For the Integral community, which thinks of the cognitive line as "What am I aware of?", this may involve a qualitative interview on that very question. For a different community, however, a different research instrument may be more appropriate—again, depending on the purposes and goals of the assessment. Cognition for what purpose? Why? When? Under what conditions? And so on.

Devising appropriate tasks for some of these broadly defined lines is no easy feat (while devising tasks for more concrete skills is much simpler). Yet *every* developmental assessment involves some kind of task, so this challenge is not unique to the LAS. What *is* unique to the LAS is how the targeted differential analysis of skills can be lined up on a *single* developmental axis. With this background in place, we can now turn to the LAS.

## **Introducing the Lectical™ Assessment System**

### **On Generic Properties Indicative of Development**

The clearest way to introduce the LAS is to look at some data. Table 1 contains the type of data that cognitive developmental psychologists typically face. These are spontaneous linguistic performances gathered via clinical interview processes. In such interviews, subjects are prompted by specific questions to focus their thought on some facet of some domain. These examples are from interviews conducted with individuals at various ages from 4 to 64. They are presented to help with the introduction of the LAS; as we proceed we will make continual reference to the properties of the linguistic performances presented here.

To begin, it is worth noting that there is an intuition regarding the *order* of the examples presented. It is very clear to most people that the examples are ordered from least developed (1) to most developed (4). Research currently underway at Harvard and the Developmental Testing Service has demonstrated that this is a robust and interesting intuition.<sup>42</sup> If you present a group of typically socialized individuals with examples like those above and ask them to *sort the examples developmentally* (i.e., in the order in which they think it would have been possible for a single individual to make the statements over the course of a lifespan), there is *always* a remarkable degree of consensus regarding the order. Moreover, the order agreed upon by the group is *almost always* the correct order, as determined by experts at developmental assessment. This finding has been replicated with hundreds of people in dozens of groups and in extremely various contexts using a wide variety of examples (for example, asking subjects to sort as many as 15 examples in domains from physics to ethics).

Protocol #	Transcripts
4	[From your perspective, what are the qualities of a good leader?] I think a leader... is a person who reframes what is believed to be appropriate or possible. There's a lot woven into that statement. You're working to effect some collective goal, to help the people of the organization achieve something, to leverage their efforts. Leadership is service, which in this case, means helping people make meaningful sense of, and become personally involved with, a coherent sense or statement of what the organization's about and to guide them in the co-creation of a new statement or better statement, a refined statement that subsumes individual goals into collective goals. (ID: 0058)
3	[What do you think makes a good leader?] Someone who follows the rules and sets boundaries. Someone who does what they have to do in order to move forward. They also try not to make a bad example out of what they are doing. Good attitude in all things. Nice personality, get to know everybody, helps everybody. Does not exclude anybody. A leader needs to let people know where they're going and know what they should or should not do. (ID: 10107)
2	[What makes a good leader?] If you can trust the leader. [And why is it important to trust the leader?] So you know that you don't have to lie or something. [Why is lying bad?] Because it can get you into more lies. [Ok...is there anything else you can think of about a good leader?] Being honest. [And why is that important?] Because you need to be honest. Because if you lie, something bad might happen. [What do you mean?] Like you can't stop lying. (ID: 0171)
1	[Okay, what do you think is a good leader?] It's someone who is in charge or in front of a line or something. [What would make someone a good leader?] Not screaming and crying. [Not screaming and crying, why is that?] Because then you would be making a fuss. You aren't supposed to make a fuss. It's bad. (ID: 1083)

Table 1. Four Examples of Reasoning in the Leadership Domain

These findings are extremely suggestive. The goal here is to explain the LAS as a refinement of this intuition. Roughly speaking, we begin with an undeniable *intuition of altitude* that must be refined into a measurement system. As a clarifying example, think of the days before rulers, scales, and thermometers. Length, weight, and heat were all common perceptible properties of objects before we devised systems of weights and measures. After a certain stage in anthropogenesis (i.e., after the general emergence of concrete-operations), most of us could sort objects from longest to shortest and heaviest to lightest, etc. That is, we were aware of these universal properties before the invention of the ruler and the scale. Entire civilizations and economies were built around what we would now consider to be relatively *informal* measurement systems. It was only recently that the scientific codification of weights and measures was finalized.<sup>43</sup>

We suggest that we have comparable intuitions regarding some properties indicative of psychological development, which for the first time are beginning to be refined into scientific systems of measurement. This is akin to claiming that intuitions about the development of others

are a part of our capabilities for everyday language use and interaction. Think about how we automatically change the way we speak and act towards children, or better, how we adjust our words, behaviors, and expectations over the course of interactions with strangers as we come to get a sense of their capabilities. In order to communicate and cooperate effectively, we make informal holistic measurements of the relative maturity, intelligence, and competence of those with whom we are engaged. A developmental assessment system would, in effect, mobilize and refine these already existing capabilities in order to codify a more reliable and intersubjectively valid set of measurement criteria; just as rulers and scales refined our pre-existing abilities to detect length and weight.

When one reads through table 1 with an eye to detecting developmental differences, *some kind of intuition*, common across individuals, allows us to make *judgments* about which examples belong where in the developmental hierarchy. When asked to justify these judgments, individuals typically suggest that they have honed in on certain properties of the examples. Here is a fairly representative list of the kinds of properties that are intuitively taken as being indicative of development: *length, vocabulary, sophistication, maturity, degree of egocentrism, requisite experience entailed by statements, soundness, perspective-taking, abstraction, complexity, etc.* Honing in on one of these, say *length*, would allow you to justify arranging the examples in table 1 in a particular order: 1 is shorter than 2, which is shorter than 3, which is shorter than 4. Or take *maturity*: 4 seems more mature than 3, which seems more mature than 2, which seems more mature than 1. So, ostensibly and intuitively, there are many properties of linguistic performances that are indicative of development. But more than a century of cognitive developmental research has winnowed down the list, suggesting that there are only a few that can be applied to serve as domain general and objective measures.

The essential insight here, which can be traced back to the origins of developmental structuralism (e.g., Baldwin), is that there are *layers of structure* (see figure 4).<sup>44</sup> Any linguistic performance has *conceptual content*, which is simply what was said. If we look at the conceptual content, we see only the particular views expressed and other non-structural properties such as length and vocabulary. Beneath this mere content we find the *surface structure*. This is the layer of structure targeted by most developmental assessment systems. It is here we find rich, evaluative, and domain specific criteria such as maturity, soundness, degree of egocentrism, or appeals to the experience or knowledge entailed by statements. For example, Kohlberg's assessment system involves recognizing certain key concepts as being indicative of underlying socio-moral perspective-taking capabilities.<sup>45</sup> In the same way, Spiral Dynamics involves methods for moving from explicit conceptual content toward implicit underlying values structures.<sup>46</sup> These and similar assessment methods characterize their stages in *domain specific* terms. They are targeting the *domain specific surface structure*. Even properties like maturity and soundness are tied to domain specific evaluative criteria because, for example, what makes for a good moral judgment differs from what makes for a good aesthetic or scientific judgment. It is differences in surface structure between domains that Wilber noted in the quote above as being like "apples and oranges," which is why one cannot use Kohlberg's insights into moral development to assess development in other domains. Socio-moral perspective taking is indeed a structural property indicative of development, but only in the moral domain.

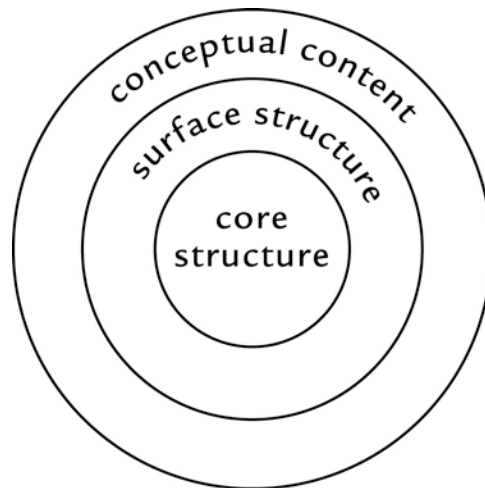


Figure 4. The Layers of Structure

The LAS targets the *domain general core structure*. Targeting the core structure means targeting *universal properties indicative of development*. This involves *looking through* the domain-specific surface structure towards more general properties and assessing development in those terms. As Wilber suggested above, and as our review of key ideas in developmental structuralism revealed, *complexity* is one such ubiquitous index of development. *Abstraction* is another.<sup>47</sup> An assessment system that characterizes its stages in terms of these properties can assess development in any domain. So, honing in on the *abstraction* and *complexity* of the linguistic performances in table 1 allows us to justify a developmental ranking: 4 is more abstract and complex than 3, which is more so than 2, which is more so than 1. Below, we will explore how to *analyze* differences in abstraction and complexity in light of the measurement criteria codified by the LAS. However, a bit more groundwork needs to be laid before that will make sense.

Importantly, privileging these universal properties over domain-specific properties does not entail that the latter are in error or do not deserve attention; in fact, quite the opposite is the case. As we will see, the LAS can measure development in any domain, but it leaves the substantive and evaluative domain-specific properties out of its measurement criteria. This allows for objectivity, but it also requires that LAS be supplemented by domain-specific considerations.

It is also worth noting here that this way of thinking about *layers of structure* dovetails with Wilber's theorizing about structures. Beginning with the *Atman Project* running through *Transformations of Consciousness* and up to *Integral Psychology*, Wilber has posited a variety of structures. To summarize briefly, he suggests several classes of structures: levels/lines (which we have been discussing), enduring/transitional, and deep/surface.<sup>48</sup> There are also what he calls *basic structures*. *Enduring structures* are those that remain intact and continue to function even after they have been outmoded by newer structures; they are *subsumed*. *Transitional structures*, on the other hand, are those that disappear once they are outmoded; they are *replaced*. *Deep structures* (or *deep features*) are those that are relatively universal, being common across groups of various sizes. Lines are generally considered to be *deep structures*. *Surface structures* (or *surface features*) are those that are relatively local, unique to particular groups or individuals. The *basic structures* are, roughly speaking, *deep enduring levels*. As should be clear from the

discussion above, the core structure targeted by the LAS is closely related to these basic structures, which are closely related to the construct of altitude.

### **An Outline of the Core Structure Targeted by the LAS**

The core structure targeted by the LAS is best understood in terms of Fischer's skill theory. Based on the research of Fischer, figure 5 displays the full range of well-researched capabilities, from birth through adulthood.<sup>49</sup> The LAS only focuses on linguistic performances, which emerge midway up the model. Thus Fischer's *model* covers the full spectrum, while the LAS *measures* only the range of levels that are linguistically mediated. Nevertheless, Dawson and colleagues have shown using psychometric techniques that there are continuities of shape and transition phenomena across the full range of capabilities covered by Fischer's model.<sup>50</sup> This suggests that even though the LAS targets language, given appropriate methodological adjustments (such as those employed by Piaget in his research of sensorimotor stages), the general constructs and suppositions apply to non-linguistic behaviors as well. Thus, following Fischer, the LAS represents development in terms of a hierarchy composed of *tiers* and *levels*. To explain this hierarchy of levels and tiers, it is easiest to adopt the terminology of a particular domain. Below we have adopted Fischer's largely cognitive terminology for ease of exposition and because the LAS was developed in light of this particular model.

Reflexes, actions, representations, abstractions, and principles are the tiers, which signify large-scale reorganizations of thought and action. *Reflexes* are the most basic building blocks, the instinctive, semi-conscious, self-correcting, "circular reactions" of early infancy. *Actions subsume systems of reflexes*. They are controlled and intentional physical interventions into an environment, which are organized in pre-verbal sensorimotor structures. *Representations subsume systems of actions*, reorganizing them by re-presenting them as conscious internal (e.g., mental) constructs. They are the concrete categories, images, and languages typical of childhood, early adolescents, and some educationally or mentally disadvantaged adults. *Abstractions subsume systems of representations*, reorganizing them by abstracting increasingly general and ostensibly intangible properties. They facilitate the kind of context-transcending thought processes that characterize the functioning of most literate adults. *Principles subsume systems of abstractions*, reorganizing them in terms of overarching and dialectically rich conceptual elements. They facilitate the construction of theoretical frameworks and postconventional worldviews and are rarely found in typical adult populations, e.g., those without extensive graduate-level education or equivalent reflective experience.

Within each of these tiers there are a series of levels. The levels represent the increasingly complex coordination of the conceptual elements made available at that tier. These elements are first found as single *concepts*, which are then linked in linear *mappings*, and then into increasing complex *systems* until a large-scale reorganization becomes necessary, at which time a new tier emerges and the within-tier levels repeat. So at the *abstractions* tier, for example, single abstractions initially are found, then more complex linear relations, or mappings, between abstractions are formed, followed by systems of multivariate relations between abstractions. When these systems become rich enough, and conditions are conducive to transformation, these systems of abstractions are subsumed via *principles*, and a new tier begins. So, what we have is 13 levels moving through 5 tiers, from reflexes to principles, a hierarchy of increasing abstraction and complexity.<sup>51</sup> Two additional levels, principled mappings, and principled

systems, are currently being studied and may be added to the system if the data warrant their inclusion.

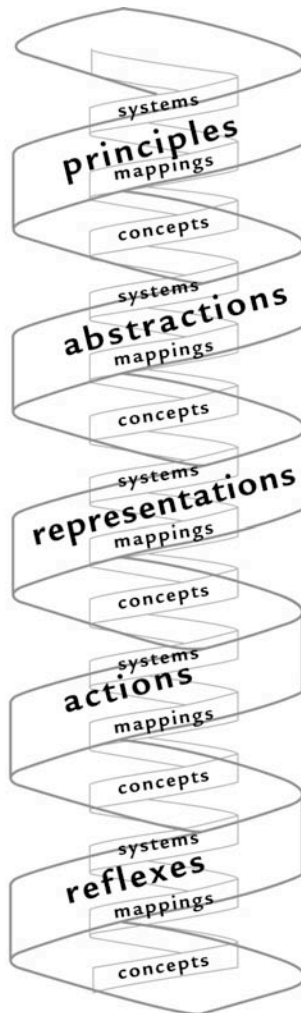



Figure 5. Tiers and Levels of Development

These higher levels are rare, so data is hard to find, but initial findings suggest that the lexicon indicative of these highest levels is variable and idiosyncratic, involving the construction of neologisms embodying extremely abstract conceptions. This linguistic heterogeneity at the highest levels suggests that these levels are not firmly established in the Lower-Left quadrant and are being pioneered by certain exemplary individuals and communities. Wilber posits levels beyond those modeled by Fischer and measured by the LAS.<sup>52</sup> The degree to which these higher-levels are trans-linguistic and should be understood as structures (as opposed to states) is an open question, thus the applicability of the LAS to these level is also an open question.

Table 2 displays how these levels line up with other developmental assessment systems. Correspondences were either derived through empirical research or by determining the hierarchical complexity of the level descriptions.



	Skill levels (Fischer)	GSSS (Commons)	SISS (Kohlberg)	GLSS (Armon)	RJ (Kitchener & King)	SOI (Kegan)	SD (Beck)	Perspective (Cook-Greuter)
14	principled systems	cross-paradigmatic					coral	cosmic
13	principled mappings	paradigmatic	stage 6		stage 6 & 7		global holistic	global/6th person
12	single principles	meta-systemic	stage 5	stage 5	stage 5	interindividual	systemic-integrative	5th person
11	abstract systems	systemic	stage 4	stage 4	stage 4	institutional	relativistic	4th person
10	abstract mappings	formal	stage 3	stage 3	stage 3	interpersonal	individualistic achiever	3rd person
9	single abstractions		stage 2				absolutist	
8	representational systems	concrete		stage 2		imperial	power gods	2nd person
7	representational mappings	primary	stage 1				magical-animistic	
6	single representations	pre-operational		stage 1		impulsive		1st person
5	sensorimotor systems	sentential						
4	sensorimotor mappings	nominal						
3	single sensorimotor actions	sensory-motor						
2	reflexive systems	circular sensory & motor						
1	reflexive mappings	sensory & motor						
0	single reflexes	calculatory						

Table 2. Displaying the LAS with Other Systems

Now, as mentioned many times, the LAS can only assess linguistic performances. What follows is a brief account of how it works. We dissect linguistic performances into their components, separating concepts (conceptual elements) from their organization (logical structure). We then provide guidelines for assigning a *degree of abstraction* to the concepts and a *degree of complexity* to the organization. The LAS outlines a very simple developmental pattern of recursive *hierarchical integrations*, accounting for and clarifying how it is that some linguistic performances are more developed than others.

Lectical™ level	Order of abstraction in conceptual elements	Logical structure
Single Representations	Concepts are 1st order representations. These are concepts that are 'containers' for concrete instances, coordinating systems of sensorimotor schemes.	The logical structure is definitional. It defines one aspect of a single representation.
Representational Mappings	Concepts are 2nd order representations. These are concepts that use or modify sets of 1st order representations.	The logical structure is linear or a mapping. It coordinates one aspect of two or more representations.
Representational Systems	Concepts are 3rd order representations. These use or modify sets of 2nd order representations.	The logical structure is multivariate or systemic. It coordinates multiple aspects of two or more representations.
Single Abstractions	Concepts are 1st order abstractions. These integrate systems of representations into single abstractions.	The logical structure is definitional. It identifies one aspect of a single abstraction.
Abstract Mappings	Concepts are 2nd order abstractions. These use or modify 1st order abstractions.	The logical structure is linear or a mapping. It coordinates one aspect of two or more abstractions.
Abstract Systems	Concepts are 3rd order abstractions. These use or modify 2nd order abstractions.	The logical structure is multivariate or systemic. It coordinates multiple aspects of two or more abstractions.
Single Principles	Concepts are 1st order principles. These integrate abstract systems into single principles.	The logical structure is definitional. It identifies one aspect of a principle coordinating abstract systems.

Table 3. A Refined Vocabulary for Dissecting Properties in Linguistic Performances

Table 3 lays out the kind of precise language needed to really dig into analyses. Let us return to example 1 from table 1 to employ the LAS and clarify how it works. Example 1 reads as follows:

[Okay, what do you think is a good leader?] It's someone who is in charge or in front of a line or something. [What would make someone a good leader?] Not screaming and crying. [Not screaming and crying, why is that?] Because then you would be making a fuss. You aren't supposed to make a fuss. It's bad. (ID: 1083)

In using the LAS, we separate the conceptual elements and the logical structure in order to determine their relative degrees of abstraction and complexity. The figures below clarify this. Figure 6a is a surface-level map of example 1 that includes the important concepts. Figure 6b clarifies how complex the conceptual elements are and how the logical structure is organized. Figure 6b shows what the LAS allows us to do. The figure re-represents the linguistic performance by employing the measurement criteria provided by the LAS. Just for contrast, compare figure 6a and b to figure 7a and b, which is a map of the most developed protocol in table 1. There is not space here to give a detailed account of how to characterize the differences in terms of the vocabulary of our model. Nevertheless, the differences in both the abstraction of the conceptual elements and the complexity of logical structure should be clear.

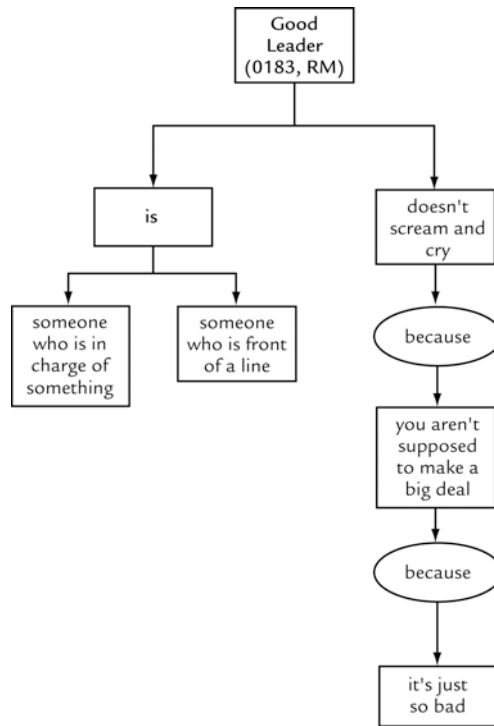


Figure 6a. Map of Example 1

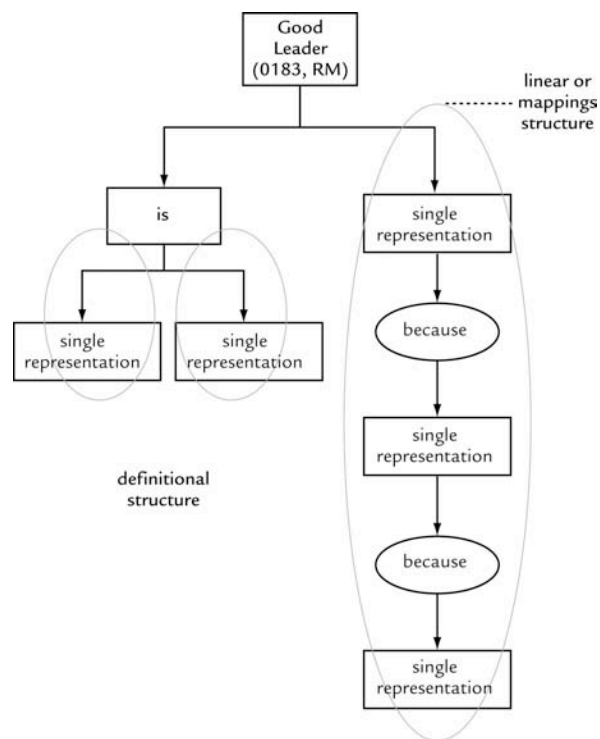


Figure 6b. Map of Example 1 as Dissected by the LAS

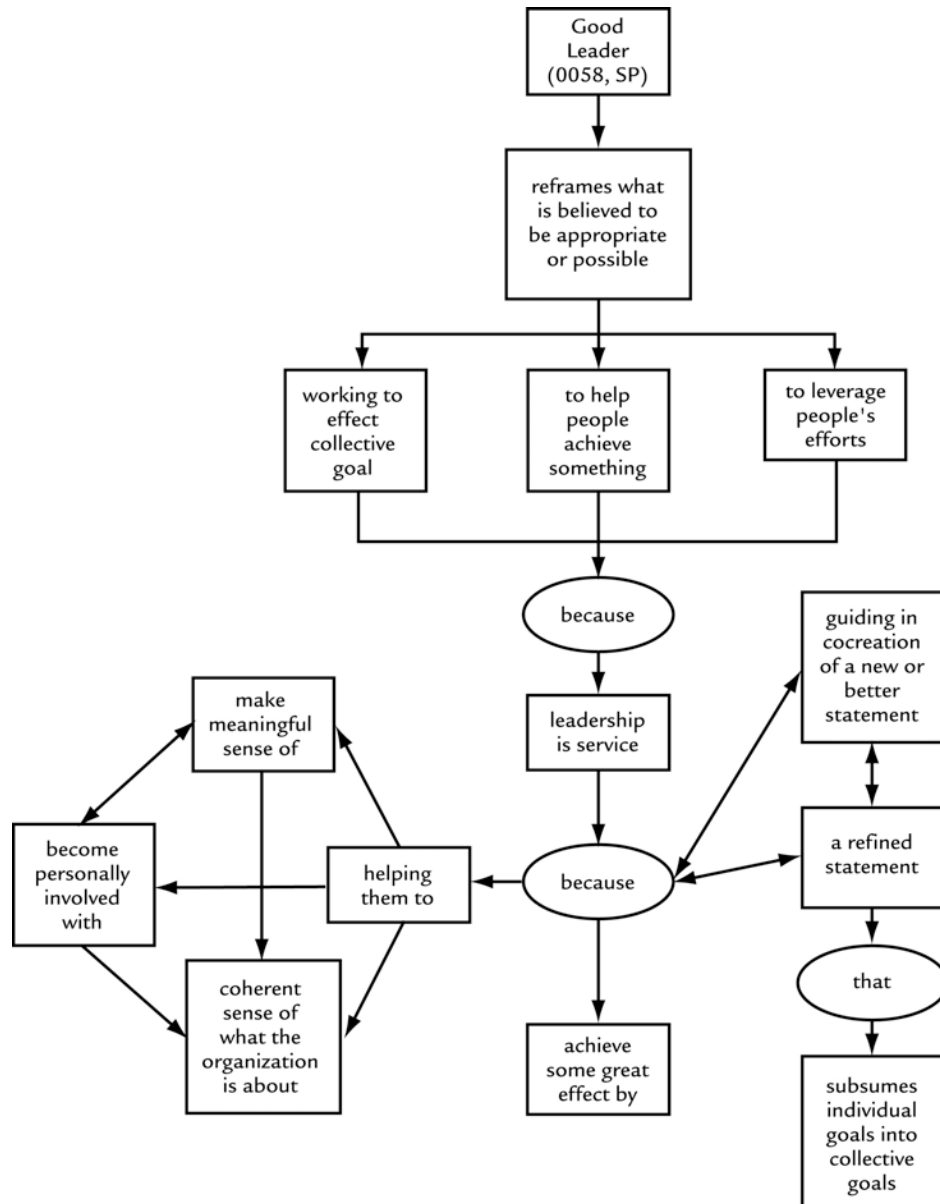


Figure 7a. Map of Example 4

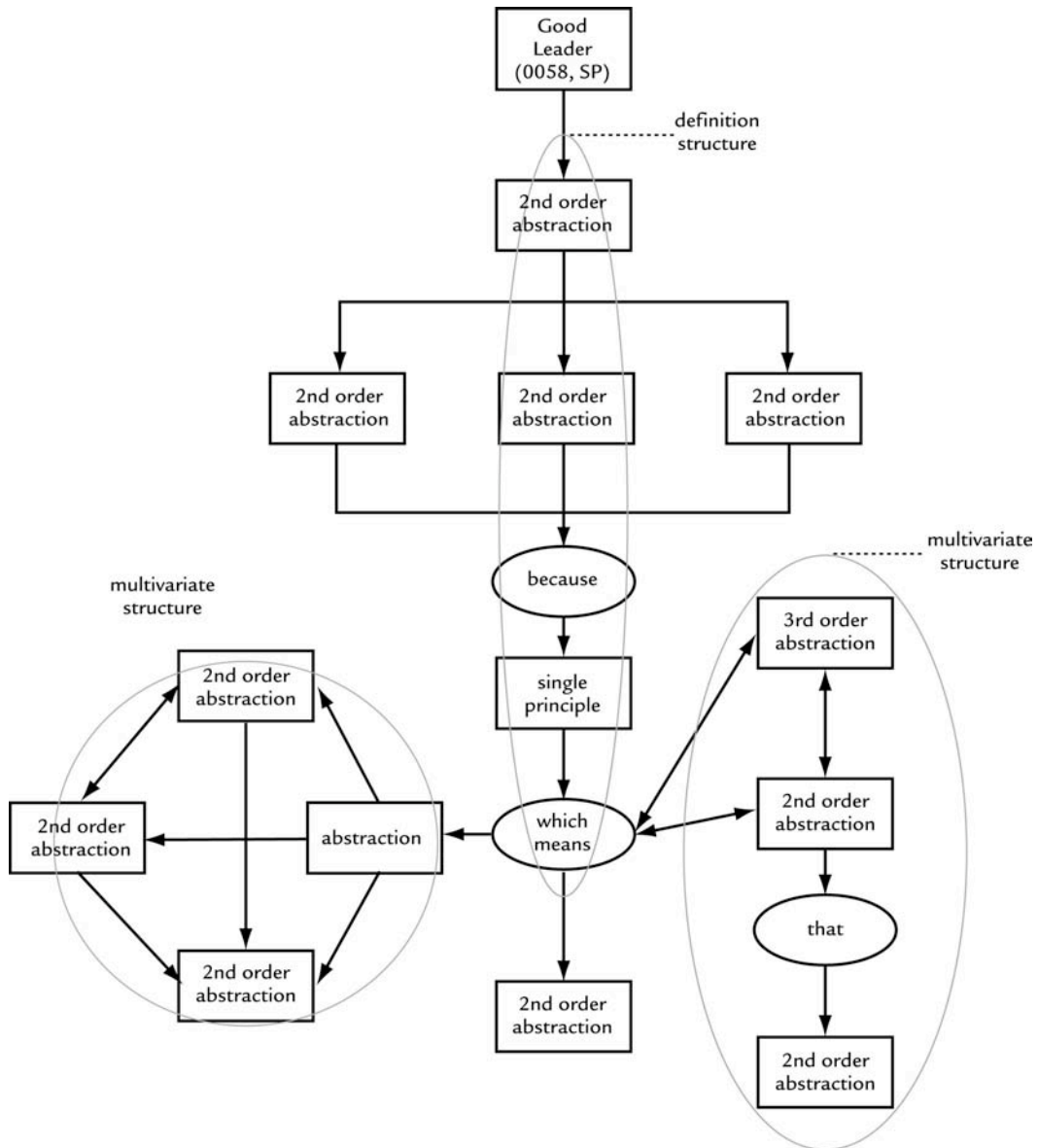


Figure 7b. Map of Example 4 as Dissected by the LAS

### Concerning Validity: Research About the LAS

We now turn to the validity and reliability of the LAS as a developmental metric. The goal here it to offer further evidence that the LAS is what it claims to be. We intend to show that based on years of empirical research, the LAS has (1) exhibited high inter-rater reliability; (2) corresponds extremely well with the scores assigned by other developmental metrics, suggesting other metrics actually measure the same *latent dimension*. This section will unpack each of these findings in turn.

### **Inter-Rater Reliability**

The necessary “first step” in showing that a developmental metric is, in fact, measuring *something* is to demonstrate that trained raters can agree on score assignment. If raters consistently fail to agree, it suggests that the metric is poorly developed or idiosyncratic. The LAS and its precursor, the Hierarchical Complexity Scoring System, have been shown to have a high inter-rater reliability rate of 80-97% agreement within half a developmental level, which equals or exceeds levels reported for other metrics.<sup>53</sup> Certified Lectical Analysts are currently required to maintain a minimum 85% agreement within 1/3 of a level with a Master Lectical Analyst.

### **Comparisons Between Scoring Systems and the Latent Dimension Hypothesis**

The LAS has been compared to several other developmental metrics, such as Kohlberg’s Standard Issue Scoring System for morality; Armon’s Good Life Scoring System for evaluative reasoning about the good; Perry’s Scoring System for epistemological understanding; and Kitchener and King’s Reflective Judgment Scoring System.<sup>54</sup> These studies have shown that the LAS can be used reliably to score the domain-specific performances typically scored with these systems. That is, scores awarded using the LAS *line up with* scores awarded by the domain-specific systems. The fact that raters using very different systems assign equivalent scores suggests that the metrics are *measuring the same thing*. Dawson suggests that this *latent dimension* is hierarchical complexity. Here, we suggest that they are all honing in on altitude.

In addition to studies of cross-system inter-rater agreement, Dawson has also demonstrated evidence of a shared latent dimension using a technique called *Rasch modeling*. Rasch modeling was developed to address issues of objective measurement in the human sciences. The key difference between Rasch modeling and typical statistical modeling (such as multiple regression) is that Rasch modeling focuses on whether the data fit the model, rather than whether the model fits the data. We aren’t trying to find the best model to describe the data we have, but assessing whether the data we have were gathered by an assessment that meets the criteria for objective measurement—e.g., constant distance between units, universal applicability, invariant order, and so on.<sup>55</sup> We are attempting to assess the assessment. Rasch modeling rescales data in a way that allows us to compare across metrics as well as assess the difficulty of individual items (or in the case of developmental metrics, the “difficulty” or distance between developmental levels).

Dawson and her colleagues applied Rasch modeling to several large data-sets: for example, LAS scores compared to Kohlberg scores; LAS scores compared to Kohlberg and Armon scores; and LAS scores alone.<sup>56</sup> In the comparison with both Kohlberg’s scores and Armon’s scores, the correlation between the domain-specific system and the LAS, after being rescaled using the Rasch model, was 0.92. Thus the vast majority of the variance between systems ( $R^2 = 0.85$ ) was accounted by the psychometrically refined construct of hierarchical complexity. These findings support Dawson’s contention that these assessment systems are best understood as unintentionally measuring the same *latent dimension*, i.e., altitude as manifest in hierarchical complexity.

Overall, research has shown that the LAS is a reliable and objective measure. Not only has it been shown to be more reliable than other measures, there is evidence that domain-specific measures indirectly tap a common latent dimension, which the LAS taps directly. As we will see,

there are advantages to cutting out the middleman, as it were, and using the LAS to assess hierarchical complexity directly.

### Concerning Utility: Putting the LAS to Use

Because the LAS is a domain-general measure, it is a powerful methodological instrument with broad applications. Below we focus on how to use it to build psychographs for the linguistically-mediated lines. But the LAS has been used to do many things, such as assess the distribution of capabilities within groups, generating organizational developmental profiles; study the development of knowledge in a variety of domains, producing rational reconstructions of learning sequences; and design developmentally sophisticated curricula, which can be linked with developmental assessments, thus creating developmentally customized learning environments.<sup>57</sup> Most of these applications have been the result of research conducted by the Developmental Testing Service, LCC for the federal government.<sup>58</sup>

### Building Psychographs: Diachronic, Synchronic, General, and Focused

The psychograph presented above in figure 3 is only one type of psychograph. There are actually several classes of psychographs, and the LAS can be used to build any psychograph targeting lines that are linguistically mediated. The typical psychograph, as found in figure 3, is *synchronic* and *general*. It is a snapshot at one point in time of the distribution of capabilities across several domains. Figure 8, on the other hand, is a *diachronic* psychograph that is *focused* on the domain of leadership. It follows an individual through time, tracking the development of different capabilities *within* the leadership domain. There are also *diachronic general* psychographs (following several domains through time) and *synchronic focused* ones (one time snapshots of the distribution of capabilities *within* a domain).

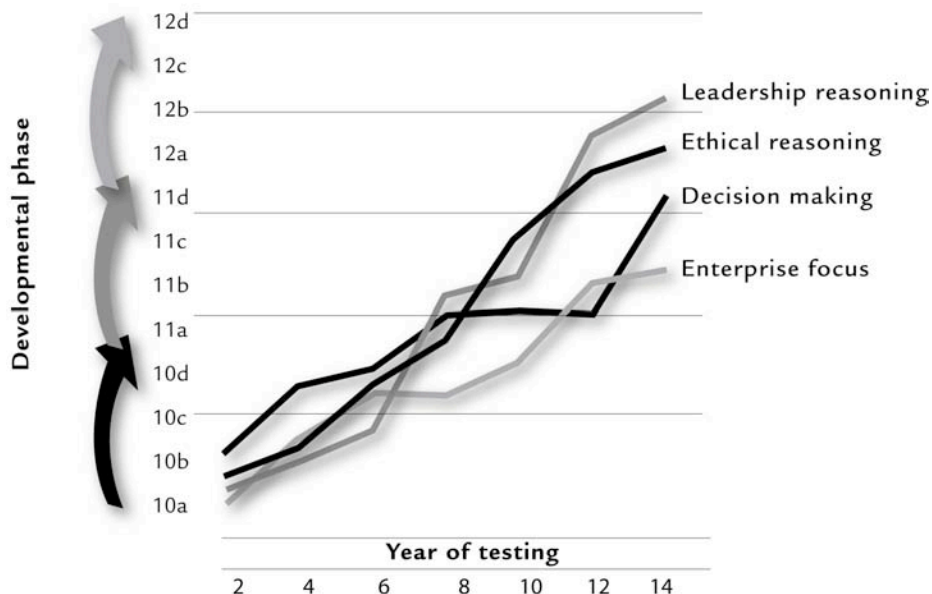


Figure 8. A Diachronic Psychograph Focused on Leadership

Using the LAS to build any one of these psychographs follows roughly the same procedure. First an individual must be given a multidimensional assessment targeting some set of different capabilities. For a *general* psychograph, this would be a set of rather disparate capabilities ranging across domains, whereas a *focused* psychograph would subdivide a single domain into several distinct but related skills, targeting each separately. In either case, different capabilities are assessed via different tasks. Typically, these tasks are open-ended questions and dilemmas aimed at exposing how individuals think. So for a *focused leadership psychograph*, the assessment might include: (1) a workplace dilemma targeting *decision-making*; (2) a set of questions about the nature of the leadership targeting *leadership reasoning*; (3) an ethical dilemma about leadership targeting *ethical reasoning*; (4) an exercise in strategic planning targeting *enterprise focus*.

After the results of the multidimensional assessment have been collected, the analytical process begins. As explained above, the LAS dissects linguistic performances, exposing the core structure, which allows us to place any given performance at some point in the developmental hierarchy. When we use the LAS to analyze an individual's performance on a multi-dimensional assessment, we generate a unique score for each different task. Each distinct capability is analyzed separately but *with the same ruler*. Thus, we can align the different performances along a common metric, giving us the data needed to build a psychograph. If we are producing a *synchronic* psychograph, one round of analyses is sufficient and we need only be concerned about the best means of graphically representing the findings. A *diachronic* psychograph, on the other hand, requires that we re-test the same individual repeatedly using the same assessment and then compile the cumulative results into one figure.

The LAS streamlines the construction of psychographs because a single method is used to analyze the results of a single multidimensional assessment. Moreover, because one ruler is used to measure development along many lines, it is easy to align and compare performances from disparate domains. That is, operationalizing aspects of altitude means literally utilizing the dimension specified by the y-axis of the psychograph during analyses. This makes for cleaner and simpler processes of construction and interpretation. It also allows the various classes of psychographs to be built using roughly the same procedure. Of course, what we do with the psychographs we build is another issue entirely. And it is to this issue that we now turn.

## **Conclusions: The LAS in Integral Research and Practice**

Over a century of research and theory in cognitive developmental psychology has yielded a *ruler* that can be used to assess development in any domain. As a ruler, it is *independent* from what it measures and thus *empty* of particular content, making it innocent of charges concerning *line absolutism*. This ruler has been tested and put to use in a variety of ways. What this means in the context of the Integral model is that we are capable, to a certain extent, of *methodologically operationalizing* key aspects of altitude.

For certain types of endeavors this is invaluable. Take education as an example. Bringing sophisticated models of human development to bear on educational practice is clearly one goal for Integral Education. But this is easier said than done. Most developmental models have only *very general* things to offer, such as imperatives to increase perspective taking capabilities or

balance challenge and support. However, the LAS and its analytical accoutrements offer more than advice. As explained above, we can radically streamline the construction of psychographs. At DTS we have found ways to nest these psychographs in sophisticated curricular frameworks, creating customized educational environments that support optimal development along a variety of lines.

There are similar implications in areas such as Integral Leadership and Integral Business. Again, bringing sophisticated models of human development to bear on issues of practice is one key element. And again, this is easier said than done. A leadership profile, such as the one presented above (see figure 8), which targets and measures a collection of competencies, is much more informative than a holistic assessment providing only a single score (e.g., "You are a stage 7 leader"). The former allows for differentiated professional development and personal growth initiatives that target specific areas of weakness or strength, whereas the latter allows for only *very general* recommendations, such as suggestions that one "be more reflective."

There are also important implications for research and theory in human development. To mention one important set of issues: the use of a domain general assessment system allows for a clearer differentiation between *structure* and *content* in human development research. This makes it possible to more carefully characterize the nature of the levels and lines that interest us. For example, it is possible to precisely specify a *structural* definition of Second Tier (i.e., single principles reasoning) in a variety of domains. Given this, we can then differentiate the *structural essence* of Second Tier from the particular *content* associated with certain exemplary but contingent manifestations. The mere use of particular catch-phrases or the espousal of particular views would no longer serve to signify Second Tier. Instead, we would *look through* this content towards the underlying *structure* to see if Second-Tier capabilities are in evidence. It would also allow us to understand the range of views that can be manifested within the scope of certain structural parameters, which is one way of getting at issues of *horizontal health*, i.e., there is more than one way to be Second Tier and some forms are better than others.

Of course, after all this has been said the integrally informed reader should still wonder how the LAS fits into a research agenda that employs *multiple methodologies*. It should be obvious that the LAS has nothing to offer or say regarding a great many important things. Indeed, one might argue that the LAS lacks a certain phenomenological or hermeneutic sophistication. Understanding cognitive complexity is only a part of the story; zones #1, #3, and #4 still have much to offer. After all, a sample of a person's reasoning about leadership dilemmas elucidates nothing of what it is like to be that person, what it's like to be led by him, the felt-sense of him as a person, or the *goodness* of his views. These are important concerns, so by way of a conclusion we offer some suggestions about the potentials for expanding the LAS beyond zone-#2 and nesting the LAS in Integral Research efforts that implicate various methodologies.

Firstly, the LAS, although firmly a zone-#2 method, could conceivably be used to assess data typically associated with other zones. As Habermas and Wilber demonstrate, methods from developmental structuralism can be fruitfully applied in the analysis of social and cultural phenomena.<sup>59</sup> For example, public documents such as constitutions, legal codes, newspapers, and political speeches can be assessed in developmental terms, yielding zone-#4 and zone-#8 methods for the study of social and cultural evolution. Thus the LAS could be employed to

assess the complexity of institutional cultures and practices, trace the development of religious belief structures, or analyze discourse patterns and media forms in the public sphere. Clearly, outlining the feasibility of these uses are well beyond the scope of this article.

Concerning more Integral Research endeavors, there are many things that could be said about using the LAS in conjunction with methods from the other zones. Most important in this regard are the psychometric properties of the LAS. Because the LAS is an objective domain-general measure of development it remains, like a ruler, unbiased by fluctuations of content and context. This makes it ideal for measuring the effects on individual development due to interventions, such as, for example, meditation (zone #1), education (zone #3 and #4), and psychopharmacology (zone #6). Unlike other developmental assessments that measure only one line, the LAS can be used to target specific skills and generate customized developmental profiles, which allow the results of interventions to be more accurately and reliably assessed.

The ruler-like properties of the LAS also allow it to function as a fixed dimension along which disparate data from multiple-methods can be aligned. That is, it serves as a fixed point of reference in zone #2 that can be correlated with results from methods in other zones. Fischer has already made headway in this regard, using a single scale of cognitive complexity to align and integrate research efforts in dynamic systems modeling (zone #8), growth cycles in brain activity (zone #6), and intersubjectively mediated learning processes (zone #4).<sup>60</sup> One can imagine using roughly the same procedure to align the results of methods targeting the insides of the interiors of individuals and collectives (zones #1 and #3). Thus we could integrate phenomenological and hermeneutic methods along a common developmental metric, yielding rich experiential disclosures of the *hierarchically nested lifeworlds* we inhabit.

Needless to say these reflections merely scratch the surface. But the goal of this article has been only to introduce Integral researchers to a certain tool, giving a sense of how it works and how it can be useful. Although Integral Methodological Pluralism would have us supplement this tool with others when we pose questions that implicate multiple methodologies, we have sought only to make clear the existence of a valuable addition to the Integral tool box. The Lectual™ Assessment System has the potential to be of great service to Integral Research by streamlining the construction of psychographs, which are a key element of Integral Theory.

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## NOTES

<sup>1</sup> Baldwin, *Thought and things: A study in the development of meaning and thought or genetic logic*, 1906/1975

<sup>2</sup> Dawson-Tunik, "The Lectual™ assessment system," 2005

<sup>3</sup> Wilber, *Integral spirituality: A startling new role for religion in the modern and postmodern world*, 2006

<sup>4</sup> The term "Integral model" is used here to refer to all the most important aspects and principles of Wilber's meta-disciplinary philosophical framework, including especially AQAL and IMP; see next section.

<sup>5</sup> Sellars, "Philosophy and the scientific image of man," 1963/2007, p. 369

<sup>6</sup> Peirce, *Collected papers*, 1931

<sup>7</sup> Wilber, *Sex, ecology, spirituality: The spirit of evolution*, 1995

<sup>8</sup> Wilber, *Sex, ecology, spirituality: The spirit of evolution*, 1995

<sup>9</sup> Peirce, "I, it, and thou: A book giving instruction in some of the elements of thought," 1861

<sup>10</sup> Habermas, *The theory of communicative action vol. 1: Reason and the rationalization of society*, 1984

<sup>11</sup> Wilber, *Integral spirituality: A startling new role for religion in the modern and postmodern world*, 2006

<sup>12</sup> Wilber, *Integral psychology: Consciousness, spirit, psychology, therapy*, 2000

<sup>13</sup> Wilber, *Integral psychology: Consciousness, spirit, psychology, therapy*, 2000

<sup>14</sup> Wilber, *Integral spirituality: A startling new role for religion in the modern and postmodern world*, 2006

<sup>15</sup> Wilber, *Integral spirituality: A startling new role for religion in the modern and postmodern world*, 2006, p. 65

<sup>16</sup> This is a very important limitation of the LAS: the limits of language are the limits of what we can measure. Although this may suggest that the LAS can only assess the cognitive-related lines, it is not clear that language use is coterminous with what we consider to be "cognitive." Clearly, if we equate language use with cognition, then "cognition" subsumes a great many lines that Wilber typically lists as separate (e.g., ideas of the good, morality, worldview, etc.).

<sup>17</sup> Wilber, "Excerpt D: The look of a feeling—The importance of post/structuralism," 2003

<sup>18</sup> Baldwin, *Thought and things: A study in the development of meaning and thought or genetic logic*, 1906/1975

<sup>19</sup> There are other types of controls as well, including the internalized controls that check logico-mathematical thinking. But we are trying to tell a simple story here.

<sup>20</sup> Piaget, *The essential Piaget: An interpretive reference guide*, 1977

<sup>21</sup> Piaget, *The principles of genetic epistemology*, 1972, *Studies in reflecting abstraction*, 2001

<sup>22</sup> Piaget, *Studies in reflecting abstraction*, 2001

<sup>23</sup> Piaget, *The essential Piaget: An interpretive reference guide*, 1977 and *The origins of intelligence in children*, 1975

<sup>24</sup> Werner, "The concept of development from a comparative and organismic point of view," 1957

<sup>25</sup> Werner, "The concept of development from a comparative and organismic point of view," 1957, p. 126

<sup>26</sup> Kohlberg, "Stage and sequence: The cognitive-developmental approach to socialization," 1969

<sup>27</sup> Kohlberg, "Stage and sequence: The cognitive-developmental approach to socialization," 1969, p. 18

<sup>28</sup> Fischer, "A theory of cognitive development: The control and construction of hierarchies of skills," 1980

<sup>29</sup> Fischer, "A theory of cognitive development: The control and construction of hierarchies of skills," 1980; Fischer & Bidell, "Dynamic development of psychological structures in action and thought," 2006

<sup>30</sup> Moreover, this whole story should be no surprise to those familiar with Wilber's Twenty Tenets. Note Tenet 12 (especially a, b, and c: Wilber, *Sex, ecology, spirituality: The spirit of evolution*, 1995 pp. 74-78), where the directionality of all developmental processes is characterized in terms of increasing complexity, differentiation, and integration.

<sup>31</sup> Commons & Richards, "Applying the general stage model," 1984a and "A general model of stage theory," 1984b; Commons et al., "Hierarchical complexity of tasks shows the existence of developmental stages," 1998

<sup>32</sup> Again the Twenty Tenets should come to mind. Note Tenet 5 (Wilber, *Sex, ecology, spirituality: The spirit of evolution*, 1995, p. 59), where it is suggested that all holons transcend and include their predecessors.

<sup>33</sup> Fischer, Hand & Russell, "The development of abstractions in adolescence and adulthood," 1984; Fischer & Kennedy, "Tools for analyzing the many shapes of development: The case of self-in-representations in Korea," 1997; Kitchener & Fischer, "A skill approach to the development of reflective thinking," 1990; Fischer, "Illuminating the processes of moral development: A commentary," 1983

<sup>34</sup> Fischer & Biddell, "Dynamic development of psychological structures in action and thought," 2006

<sup>35</sup> Dawson-Tunik, Commons, Wilson & Fischer, "The shape of development," 2005

<sup>36</sup> Wilber, *Integral psychology: Consciousness, spirit, psychology, therapy*, 2000, p. 28

<sup>37</sup> Wilber, *Integral spirituality: A startling new role for religion in the modern and postmodern world*, 2006

<sup>38</sup> Wilber, *Integral psychology: Consciousness, spirit, psychology, therapy*, 2000, p. 28

<sup>39</sup> See Wilber, *Integral spirituality: A startling new role for religion in the modern and postmodern world*, 2006

<sup>40</sup> Gardner, *Intelligence reframed: Multiple Intelligences for the 21<sup>st</sup> century*, 2000

<sup>41</sup> Wilber, *Integral spirituality: A startling new role for religion in the modern and postmodern world*, 2006, p. 60

<sup>42</sup> Stein, Dissertation research, in prep.

<sup>43</sup> Interestingly enough, in 1878, it was C.S. Peirce who established a universal standard for the meter based on wavelengths of light.

<sup>44</sup> Note that our terminology about structures is slightly different from standard AQAL terminology. See the last paragraph of this section for some clarification. Basically, for us the core structures are the basic structures specified by the AQAL model, while what we call surface structures are the relatively deep structures of AQAL.

<sup>45</sup> Colby & Kohlberg, *The measurement of moral judgment, vol. 2: Standard issue scoring manual*, 1987

<sup>46</sup> Beck & Cowan, *Spiral dynamics: Mastering values, leadership and change*, 1996

<sup>47</sup> In this context abstraction should be understood in a technical sense, i.e., as being the result of hierarchical integration. As noted during the discussion of developmental structuralism, hierarchical integration is a kind of chunking or condensation process in which the many (differentiation) become one (integration). Thus abstract concepts are those that integrate various less abstract ones. Unfortunately, the term abstraction also signifies one of the levels in Fischer's model. There are only so many words to go around, so pay attention to context and usage.

<sup>48</sup> See Wilber, *Integral psychology: Consciousness, spirit, psychology, therapy*, 2000, chap. 1, nt. 7.

<sup>49</sup> Fischer, "A theory of cognitive development: The control and construction of hierarchies of skills," 1980; Fischer & Biddel, "Dynamic development of psychological structures in action and thought," 2006

<sup>50</sup> Dawson-Tunik, Commons, Wilson & Fischer, "The shape of development," 2005

<sup>51</sup> Dawson-Tunik, "The lectical™ assessment system," 2005

<sup>52</sup> Wilber, *Integral spirituality: A startling new role for religion in the modern and postmodern world*, 2006

<sup>53</sup> Dawson, "Assessing intellectual development: Three approaches, one sequence," 2004; Dawson & Gabrielian, "Developing conceptions of authority and contract across the life-span: Two perspectives," 2003; Dawson-Tunik, Commons, Wilson & Fischer, "The shape of development," 2005

<sup>54</sup> Dawson, Xie & Wilson, "Domain-general and domain-specific developmental assessments: Do they measure the same thing?" 2003; Dawson, "Layers of structure: A comparison of two approaches to developmental assessment," 2001; Dawson, "Assessing intellectual development: Three approaches, one sequence," 2004; Dawson, "New tools, new insights: Kohlberg's moral reasoning stages revisited," 2002a

<sup>55</sup> Fisher, "Objectivity in measurement: A philosophical history of Rasch's scalability theorem," 1992

<sup>56</sup> Dawson, Xie & Wilson, "Domain-general and domain-specific developmental assessments: Do they measure the same thing?" 2003; Dawson, "A comparison of three developmental stage scoring systems," 2002b; Dawson-Tunik, Commons, Wilson & Fischer, "The shape of development," 2005

<sup>57</sup> Dawson-Tunik & Stein, National leadership study results, 2004; Dawson & Stein, *National decision-making curriculum: A framework*, 2004, and *Decision-making curriculum: Results of the pre-and post instruction developmental assessments with control group*, 2006

<sup>58</sup> The detailed reports, most of which are available to the public, can be found here:

<http://lectica.info/references.html>.

<sup>59</sup> Habermas, *Communication and the evolution of society*, 1976, and *The theory of communicative action vol. 1: Reason and the rationalization of society*, 1984; Wilber, *Up from Eden: A transpersonal view of human evolution*, 1981

<sup>60</sup> Fischer & Biddel, "Dynamic development of psychological structures in action and thought," 2006

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