The Zone of Proximal Development of Psychological Assessment

HESSELS, Marco G.P.

Abstract

In this chapter the author makes some critical comments on research on dynamic assessment and discusses the advancements, especially in modern measurement theory and computers, that allow researchers to construct better dynamic assessment instruments.

Reference

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Marco G.P. Hessels, Erasmus University, Rotterdam

I will start this contribution with showing you a picture of, presumably, a gifted boy. The picture shows a young boy with his face turned to the ground, who is pushing against a school door on which the sign "PULL" is attached. The school sign reads "School for the gifted". As you can see he is obviously not using his full potential. Perhaps it is his first day in a new school and he does not know the way exactly yet. Perhaps the school is known to him, because he has been attending the school for some years now, but he is being sleepy and absent minded. Another possibility is that this child cannot read yet: the word "pull" has got no meaning. Just some symbols on the door, for grown-ups. Or perhaps this is not a gifted child at all. He is just a boy who took the wrong entrance: his primary school is around the corner.

In all instances, the problem of how to get into the right school needs to be solved and something is preventing this: The school is fairly new to the child and the fact that the doors open towards the outside has not been (over)learned; the boy is having a bad day because he stayed up late last night to see Mark McGwire hit his sixty-second homerun; he is just not able to read the instructions; or, as in the last example, the child does not know the way at all to his school. The problem of getting into the right school is not solved at this moment, but perhaps it can be solved (Although I know enough children that would like this problem to remain unsolved).

Most of you will have noticed the analogy I am making with the problems children and adults face when they have to solve problems in standard testing situations. We all know that a lot of factors, next to the one we actually want to measure, can cause them to not solve these problems. Problems that they are quite able to solve when they are given the opportunity to try again or when they are taught how to solve these.

Once researchers and practitioners recognized that standardized tests did not always allow children to show their real capacities, the search for and the development of new assessment instruments and procedures began, and especially learning potential or dynamic assessment. The birthday of one of the pioneers in this field, Prof. Guthke, is the reason we are all here today. And I can really say he is
a pioneer, because when he published *Zur Diagnostik der Intelлектуellen Lernfähigkeit*, I was still in primary school. I am still a rookie in the business, as you can see.

I guess you all know what is meant when we talk about learning potential or dynamic assessment. If not, you will probably hear it being explained more than once today. Those among you with a high learning potential will know after they have heard it once, those among you with a low potential may never learn what it means at all. When we talk about potential, we talk about latent resources that are not yet addressed, but that can in principle be made available. Like Allen in this picture (taking an extra brain out of his inside pocket while doing an exam), addresses his latent resources.

When we look at the literature on learning potential we see a wide variety of approaches, procedures and methodologies, but all with one general aim: to provide better and/or more specific information than standard tests. And we (the researchers in this domain) all think we do better than the standard tests. We do not only think so, we *know* it. We even write it down on paper and we publish it. After all, in today's academic world, it is 'publish or perish'.

What I mean to say is that we are all very enthusiastic about our work in this area. And of course: intuitively, it *must* be better what we are doing! It seems to me, however, that sometimes we are not enough critical towards our own work. We want it so much to work, that we know what we have done works, even before we have seen the cool and cold statistical figures. Besides, what is more frustrating for a researcher than to find out that his approach or what he has developed does not work, and as a result, he has got nothing to publish. I think, however, that this is one of the flaws of psychological research and of research in the social sciences in general. We only tell about what works, but seldom we try to publish about what did not work. In my opinion, this leads to a situation in which we often try to invent a new wheel, of which we could have known that it doesn't roll as well as we thought it would, if we had been able to read about this wheel, that somebody else had already invented before us.

As you can see, I am somewhat critical about the research that has been, or is being carried out in the field of learning potential. I immediately add, it is not only this field of research. What we also tend to forget is that standard testing procedures often have a very long history of research. Moreover, what I think has been very important is that methodology and statistics were on their side and perhaps still are. In other words, even though standard test do not always have a
very solid theoretical basis, they usually have a very well documented methodological and psychometric basis. Also, they have proved their usefulness in a lot of situations and, to use an understatement, it would be somewhat silly not to make use of that anymore.

But what does this mean for us: the enthusiastic researchers that want to do better. Was it all so bad as I seem to imply? Have we been trying to invent a better wheel for nothing? Are we not taken seriously?

As you and I all know, not only do we criticize standard testing procedures, others criticize ours too and practitioners rarely apply our procedures! The dynamic approaches are often time-consuming, and we (the practitioners) already do not have enough time. The lack of standardization of the training or help that is incorporated in the testing procedures, with the danger that different psychologists will obtain different results with the same child. Too much is dependent on 'das Fingerspitzengefühl' or the adaptiveness of the psychologist. Prof. Guthke and his collaborators wrote this last year, so it must be true.

Another, very important issue is the reliable measurement of the constructs we want to measure as well as the change that has taken place as a result of the training: the measurement of the zone of proximal development.

This is the moment that I return to the title of my contribution today: The Zone of Proximal Development of Psychological Assessment. What is our Zone of Proximal Development? What is the current state of the psychological assessment procedures we developed and what is the Zone of Proximal Development of these when we are given help? Moreover, what kind of help do we need and who is going to give it to us? Does psychological assessment have a Zone of Proximal Development at all?

These questions are not easy to answer. We know more or less what we can expect of today's psychological assessment procedures: how reliable they are, what they imply and what not, what they predict and to what extent. The question is whether they can be improved and how much? A lot, or is relatively little improvement to be expected? And relative to what?

As you can see, I am asking a lot of questions. Do I have answers? I will try to give some, and maybe speculate a bit, as the before mentioned over-enthusiastic researcher.

First of all, we need to remember that social and psychological processes are different from basic scientific or chemical processes in
the sense that there are no laws, or at least we do not know of any, that govern behaviour always exactly in the same way. Like heating a chemical substance leads to increased speed of molecules and expansion of the substance (like mercury in a thermometer), and cooling down leads to the original situation: it can be predicted exactly. Since there are no laws that exactly specify psychological behaviour, we will never be able to exactly predict the outcomes of our interventions, or to predict for instance short term or long term learning on the basis of an assessment procedure. But knowing that we will always remain imperfect, we can of course try to improve ourselves. And despite the criticisms, I think that learning potential research has proved to be a viable approach, although the critics will immediately say that I am biased. Well, maybe I am and maybe my intuition that learning potential assessment must be better also shouts too loud in my ears. However, I do recognize the shortcomings of our research too and I see some of the current practical limitations. On the other hand I also see that time is on our side and we are offered new possibilities. From my point of view, two things are especially important: the methodological and statistical research of the last decades and the enormous growth of the power of personal computers in the last ten years.

One of the great advancements in methodology and statistics is the introduction and evolution of modern measurement theory, as well as different types of statistical modeling. Research in modern measurement theory, that is, item response theory, has expanded rapidly since the beginning of the 1980's. The model that is most known, is the model of Georg Rasch which was first introduced in 1960. Item response models have various attractive properties, such as measurement on a true interval scale on which both persons and items can be represented, the construction of item banks (i.e. large sets of items that all measure the same construct), and computerized adaptive testing (i.e. the computer adapts the test to the capacities of the child, which makes that relatively few items need to be administered while obtaining a high reliability). Such procedures have already been implemented with regard to training of psychological abilities (e.g. Embretson, 1987; Pennings & Verhelst, 1993) as well as school subjects (the Dutch Institute for Test Development, Cito).

I recall that I have had several discussions with Prof. Guthke about these models and the opportunities they might have for learning potential research. I remember that during one of these discussions he once called me a Raschist, which I didn't mind. It was spelled correctly.
Along with these measurement models, the development of structural equation models and hierarchical linear models seem to offer us new ways to model training and learning.

Next to methodology and statistics, computer technology has advanced rapidly. Personal computers have become more and more powerful, both with regard to computation as well as with regard to graphics. Also, the development of for instance computerized tests with attractive graphics has become much easier with special programming tools. Furthermore, the growing possibilities of multimedia PC's can also make testing much more easy and attractive. Multimedia PC's can thus become (and are already becoming) important tools in assessment, but also in training children certain skills. Government initiatives to provide schools with more and more powerful PC's (as we have in The Netherlands) are of course more than welcome contributions.

To answer my questions of 'what the zone of proximal development is', 'who is going to help us' and 'to what extent learning potential procedures can be improved': I think that with the help of modern methodology and modern technology new assessment instrument can be developed, that are standardized, that have a solid methodological and psychometric basis, that are not as time consuming as they are now, easy to administer and that are attractive to children and adults. The help we need must first of all come from methodologists that make us find our way in the labyrinth of measurement theories and statistical models and who help and learn us how to apply these. Secondly, we are in need of computer experts that help us with constructing the programs and computer graphics. The third source of aid is (what else), the people that decide about the money. With respect to the latter, the growing interest in multimedia experiments, both within the government as within commercial publishers, gives reason for hope.

Of course, it sounds all very simple and I sound very optimistic. You know I am biased. I realize very well that constructing new tests with large item banks, as well as designing new training procedures is not a very simple thing to do. It is time consuming and it is expensive. However, I do think that we need to innovate our tests and approaches, by making use of recent developments in methodology and computers, to show that we are not just inventing the same new wheel, but a wheel that really rolls better. Then we can show that learning potential research is not just one of the viable alternatives to standard psychological testing.
REFERENCES


