Recent Research Supporting a Specific-motive-based Model of Competence

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Background
Precipitated by chance attendance at a seminar led by Rene Mottus
His team had accidentally discovered that much better predictions of changes in “personality” with age could be made from individual items extracted from Big 5 questionnaires than from either factor scores or carefully selected clusters of items deemed to measure “facets” of personality.
Here are some of the results
Table 1. *Correlations between actual ages and ages predicted by elastic net models based on the Big Five domains, facets, items and their residuals.*

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<th>Big Five</th>
<th>Facets</th>
<th>120 items</th>
<th>300 items</th>
<th>Residuals of 300 items</th>
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**NOTE:** The mean and standard deviation ($SD$) are across 100 replications with the training sample of 67% of the total sample.
And here are some of the conclusions drawn
First, the Big Five domain scores excluded over half of the age-sensitive information available in the data.

- While the accuracy of the Big Five-based predictions averaged at $r = .28$
- the 30-facet-based predictions had an average of $r = .44$
- and the 300 item-based predictions achieved more than two times higher correlations with age with average $r = .65$
But the fourth finding was the most dramatic:

Individuals at different ages differed in specific behavioural, cognitive, affective and motivational patterns indexed by *individual items*, not because they differed in the domains and facets *per se* but because they differed in something that the items uniquely reflected – that is, *nuances*. 
Clearly, we will need an empirically based and comprehensive taxonomy of *nuances* and tools for measuring them if we are to tap into this currently almost hidden, but vast, personality variance, be it for predicting outcomes, studying personality development, or other purposes.
• One way forward would be to restart the kinds of taxonomic research programs that led to the Big Five.

• This could either based on the lexical approach or start from unstructured item pools, not with the goal to identify the few major but the many dimensions of personality.
• Historically, the goal has been parsimony, achieved by aggregating and filtering out as much information as possible.

• For the development of a taxonomy of *nuances*, however, the goal should be capturing as much of individual differences in personality traits as is possible with measurement tools that are still usable.
Among other possibilities, we think that this can be achieved by creating measurement instruments that explicitly focus on the psychometric quality of single items such as their unambiguity and construct-relevance, retest reliability, cross-rater agreement, and low evaluativeness, while also avoiding wasteful redundancy among items.
(Note that) the test-retest reliability of many items is in the .70s (although it is considerably lower for many others).

Reasonably high reliability is thus achievable for even single items.
• Explicitly relying on only high-quality items will allow measuring more traits with fewer items.

• We imagine that it would be possible to measure at least 100 nuances with, say, 200 or 300 good-quality items.
Of course, I am delighted with these conclusions because they support my thesis.
But I feel I must draw attention to the sample on which the results are based – mainly because I believe that wider consideration of such things would have major implications for the interpretation of the mountains of studies which have relied on “Big Five” questionnaires.
Mottus’s studies were based on a “sample” of 24,000 drawn from a huge data set available to the research community.

But these participants had completed their questionnaires on the internet...
So: Question 1:
Who, actually, are these people?

Next, the sample had a mean age of 25 and a SD of 10.
This brings me to Question 2: Who, exactly, are the 50 year olds who have been studied?

Certainly they must differ from the younger groups in other ways besides age (they are outliers in the age distribution).
But note this in passing:

How legitimate is it to report and talk about “Standard Deviations” in such a skewed population?
These are not minor issues.

Neglect of such issues, to which the APA Task Force on Statistical Inference would have drawn attention had its final report ever been published, lie behind the “replication crisis”.
Worse they lie behind the vast mountains of misleading publications which fill our journals.
I have been made acutely aware of these problems as a result of my work with the RPM where I encountered thousands of DRIP (Data Rich, Information Poor) and DPIP (Data Poor Information Poor) studies based on tiny and unrepresentative “samples” and inappropriate applications of factor analysis and “sophisticated” IRT programmes.
Because the RPM has directly affected the lives of billions of people worldwide, these studies were not without huge social significance.
It has not been my interest to study these things in relation to the Big Five, but I did stumble across some indications of the importance of doing so some 60 years ago.
Dustman
Peter Saville

Guys who turned up with data sets re: factor analysis.
But now to go back to Mottus.

Those who attended the small seminar I mentioned then set about seeking possible explanations for the results.

These included...
The fact that factor analysis of Likert-type items yields what are, in effect, *arbitrary metrics* (in that the same score can be achieved in many different ways – i.e. a given score can, in reality, mean very different things). [In this sense they differ from measures which conform to the requirements of Item Response Theory]
The number and location of the vectors extracted as a basis on which to reproduce a large covariance matrix from a smaller number of “underlying” variables is also at the discretion of the investigator (and is, in this sense too, also arbitrary.)
But the discussion also veered off into:

• The possibility of finding genome specifications for the hundred or so “traits” that might be envisaged.
• The possibility of capitalising on the fact that people seem to have a predisposition to select themselves into environments which enhance their genetic predispositions.
• The possibility of finding additional items by extending the coverage of the questionnaires.
At this point I started to say that there existed a perhaps a more parsimonious/elegant framework for handling the observations, problems, and possibilities that had been mention as well as highlighting the areas in which it might be fruitful to pursue developments … and offered a two minute outline … to which I shall return here.
But the next development was even more unanticipated and exciting.

After the seminar I contacted a mutual colleague and asked her what she thought of Rene’s work.
This produced a remarkable collection of articles, all of which are cited in the reading list.
I don’t want to get stuck here but a couple of them dealt with the coverage issue that had been raised.

One was a remarkable paper by Tom Bouchard (2016).
Bouchard hugely expanded the nature and type of the item pool by including items derived from numerous other tests - such as the Strong Vocational Interest Blank and the Allport-Vernon Study of Values.
• Factor analysis of the resulting matrix yielded 12 factors which could be collapsed to 4.

• These are substantially different from those conventionally extracted by those who favour the *Big Five*. 
Realistic, Helping, Analytical, Aggressive, Pathology, Affiliative, Sensation-seeking, Traditional, Self-reliant, Cultured, Persuasive, Entrepreneurial

Dangerous, Authoritarian, Powerful, Down-to-Earth
Table 2
Comparison of the twelve factors with a select number of descriptive/explanatory theories/schemes dealing with interests, values, attitudes and personality.

<table>
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<tr>
<th>Schemes</th>
<th>Factors, Orientations, Values or Scales</th>
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<td>Twelve Factors (This study)</td>
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<td>Adventuring, Traditional, Self-reliant, Cultured, Persuasive, Entrepreneurial</td>
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<td>Pancer Values</td>
<td>Realistic, Helping, Analytical, Aggressive, General Psychopathology, Affiliative, Sensation-seeking</td>
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<td>(Allport-Vernon-Lindzey)</td>
<td>Adventuring, Traditional, Self-reliant, Cultured, Persuasive, Entrepreneurial</td>
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<td>Schwartz Values</td>
<td>Realistic, Helping, Analytical, Aggressive, General Psychopathology, Affiliative, Sensation-seeking</td>
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<td>Social Attitudes (Saucier)</td>
<td>Adventuring, Traditional, Self-reliant, Cultured, Persuasive, Entrepreneurial</td>
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<td>Big Nine</td>
<td>Realistic, Helping, Analytical, Aggressive, General Psychopathology, Affiliative, Sensation-seeking</td>
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<tr>
<td>Tellegen MPQ scales</td>
<td>Adventuring, Traditional, Self-reliant, Cultured, Persuasive, Entrepreneurial</td>
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But even more important from my point of view among the collection of papers were:

- Hayes, published in 1962, entitled *Genes, Drives, and Intellect*.
- Other aspects of Bouchard’s (2016) *Experience Producing Drive Theory: Personality “Writ Large”*. 
- And a paper by Johnson, (2010) entitled *Extending and testing Tom Bouchard’s Experience Producing Drive Theory*. 

In his conclusions to his long paper Hayes writes:

“Innate intellectual potential (appears to consist) of (motivational dispositions) to engage in activities conducive to learning, rather than inherited intellectual capacities, as such. These tendencies (may be) referred to as experience-producing drives (EPDs)” (p. 337).
He continues:

“The following conclusions appear to be warranted: (1) Although it has been customary to assume that activity preferences are determined by experience, there is ample evidence to show that such preferences may be genetically controlled. (2) Genetically controlled tendencies to engage in specific kinds of activity lead to the acquisition of corresponding skills and information.”
In saying these things he appears to have anticipated the process, later noted by Scarr (1983), whereby people with particular motivational dispositions select themselves into environments which cyclically enhance those dispositions.
I find the phrase *Experience Producing Drives* confusing and prefer to settle for saying that people with particular motivational dispositions tend to select themselves into environments which cyclically enhance those dispositions.
These papers were of particular interest to me because of the work we had done on the nature of developmental environments in homes, schools, and workplaces.
Expressed in terms that were not available to us at the time, these parents, teachers, and managers created environments in which people could pursue their idiosyncratic motivational dispositions and, in the process, hone the components of competence needed to pursue them effectively.
We were alerted to look for this process among parents by one of the Educational Home Visitors

[describe and discuss incident]
And here is an account of what happened in the course of an Environmentally-based project in a primary school.*.

- **About Laneton**
- **Emergent competencies dependent on emergent context and**
  - **emergent climates of enterprise able to harness multiple competencies to get things done.**

*Actually, it is a composite, but we can skip over that.*
But now note what the teacher is doing:

i.e. look at the nature of her competence.
So that is an observation about teacher competence.

Next question:
What about competence in the workplace more generally.
First study grew out of a survey of pupils’, parents’, teachers’, and employers’ perceptions of the objectives of education.

This had shown that their top priorities included the development of such qualities as self-confidence, initiative, problem solving ability, ability to work with others and so on.
So the next question was:

Are such things actually of value, particularly in the workplace?
I set out to check this by going round the country interviewing a very wide range of people ranging from small farmers and blacksmiths through hotel owners and CEOs of trans-national companies to heads of government Departments.
I would begin by asking them to “Tell me something about your job and your life” and following up with further questions especially when they got excited about some problem they had.
The results not only confirmed the pupils’, parents’, teachers’, employers’ opinions but yielded important insights into the nature of competence.
This was followed by some more systematic studies of competence in the workplace?

By the time I reviewed them there were about 80 of these.

And 300 or so by the time Lyle Spencer produced *Competence at Work*. 
These studies all relied on

*Critical Incident Methodology*
Here is one which revealed that effective managers (actually Naval officers) also created developmental environments

Klemp Munger & Spencer
(next 2 slides):
Competencies of More Effective Officers (Klemp)

1. **Initiative**: Initiates new activities, communications, proposals; Exhibits resourcefulness, persistence in the face of obstacles.

2. **Set goals** and reconsiders and redefines them.

3. **Coaches**, by setting example and sharing information and thought processes.

4. **Influences**: by persuasion, mustering arguments, building political coalitions, making others feel strong.

5. **Conceptualises**, analyses, and finds new ways of thinking about things.

6. **Builds teams**, acts to promote co-operation and team work.

7. **Provides feedback** to enable others to monitor their own performance. Helps them analyse problems and develop strategies for tackling them.

8. **Provides rewards** and official recognition for contributions.
Competencies of More Effective Officers (Klemp) cont.

9. **Control**s impulses, especially annoyance. avoids snap decisions based on incomplete evidence.

10. **Plan**s and organises, including "domain planning".

11. **Delegate**s.

12. **Optimise**: Analyses the capacity of individuals and resources and requirements of job, matches the two and fully utilises the resources available.

13. **Monitor**s own behaviour and that of others.

14. **Resolve** conflicts.

15. **Listen** actively and initiates opportunities to give others a chance to talk.

16. **Accurate empathy**: Makes explicit unexpressed thoughts and feelings of others.

17. **Help**s.

18. **Positive expectations** of others' competence.
But just for completeness here is another illustration of the importance of high level self-motivated competencies in the workplace.
Qualities which critically distinguished more and less effective machine operators (Flanagan and Burns).

1. Dependability
2. Accuracy of reporting
3. Tendency to respond to the needs of the situation without having to be given instructions
4. Ability to get on with others
5. Initiative
6. Responsibility
Now for a couple of other studies drawn from the 300 or so that were available by the time the Spencers wrote their book Competence at Work (1993).
Price, Taylor et al., Doctors

• 25 different types of excellent doctor ... different types of patient care, ability to work with and through nurses, contributions to medical organisations, academic output, contributions to non-medical organisations.

• None were positively correlated with assessments made when those concerned were students.

• Patients wanted very different kinds of doctor. LSES patients particularly wanted their doctors to be decisive and authoritative; HSES wanted attention to emotional and psychosomatic disorders and to discuss treatment.
Summary of What Said About Competence

Competence unexpectedly depends on:

1. Value-laden motivational dispositions like initiative and the ability to influence.

2. Perceptions of society and one’s role in it.

3. Understandings of terms like:
   - Participation
   - Wealth Creation
   - Management
   - Democracy

4. Emergent properties of groups that depend on a wide variety of people contributing in very different ways.
At this point I think it is important to highlight something which distinguishes these studies ... and our studies of competence in homes, schools, and workplaces ... from most other studies in the area.
Instead of looking for tests that would predict some externally determined criterion such as “academic” performance or profitability we were seeking to identify what people were good at.
The problem was that there was a lack of an appropriate conceptual framework for thinking about and discussing these things …

But, actually there was and is…

And it is to this that I will now turn.
But before doing so, I must mention one more reason for moving toward an item-based paradigm: *Psychotherapy* (Kazdin)
The framework I am talking about depends on the work of McClelland and his colleagues.

Unfortunately that work is generally thought to have been discredited because the results do not look anything like those that would emerge from a factor-analytic or IRT-based study.
It stemmed from Murray’s book *Explorations in Personality*, but the measures first got reconceptualised as:

1. measures of “Motivation”
2. And then “Competence”.

Indeed the very word *competence* was introduced to distinguish our work from work designed to identify the “knowledge, skills, and attitudes” framework nominally required for “high level” performance at a predefined job.

Unfortunately the word “competence” has been corrupted back to refer to just that.
The framework and measurement procedures were derived from experimental studies in which attempts were made to influence “motivation” by such things as starving people, or provoking sexual arousal and then looking for the effects in the stories those concerned made up about the thoughts, feelings, and behaviours of people depicted in variants of TAT pictures.
From content analyses of these stories it emerged that when people were e.g. hungry, they saw the characters in the pictures as thinking about how to get food, making plans, persisting, persuading other people to help, and so on. The same when other motives were aroused.
So then McClelland and his colleagues turned this procedure around.
If one could find out what people were thinking about, planning to do, persuading others to help them do etc. one had an index of what was at first termed their *motivational dispositions*. 
So from a pool of, as I recall, some 300 pictures they selected half a dozen relating to workplace-type situations and asked people to make up stories about them.
Here are the instructions given to people in connection with the stories they were asked to write:
On the following pages, you are to make up and write out some brief, imaginative stories about each of a series of six pictures. You will have about five minutes for each story. There is one page for each story.

To help you cover all the elements of a story plot in the time allowed, you will find four questions repeated over each story page. They are:

1. What is happening? Who are the people?
2. What has led up to this situation? That is, what has happened in the past?
3. What is being thought? What is wanted? By whom?
4. What will happen? What will be done?

Please remember that the questions are only guides for your thinking and need not be answered specifically in so many words. That is, your story should be continuous and not simply a set of answers to these questions.

There are no right or wrong stories. In fact, any kind of story is quite all right. You have a chance to show how quickly you can imagine and write a story on your own. Don't just describe the pictures, but write a story about them.

Try to make your stories interesting and dramatic. Show that you have an understanding of people and can make up stories about human situations.
And here are the pictures
The scoring then proceeded as follows:
Ask yourself what kind of activity the person who wrote the story cares about and, in a sense, how much energy he or she sees his or her characters as putting into that kind of activity.

(It is a somewhat circular process.)
In point of fact, for reasons which we do not go into here but which had something to do with discovering that they could not generate arousal conditions for most of Murray’s personality” traits, they focussed the scorers’ attention on on three: Achievement, affiliation and power.

(And they also demonstrated that these three scores had enormous impact on people’s lives and society.)
Here are some extracts from very brief scoring manuals they generated for training purposes.

Ideally, I should flick back and forth between the pages of the manuals and the scoring grids that accompanied them.
Achievement Motivation—The Four Clear Signs

Prime Test: Determine whether any of the characters in a story has an achievement goal—does he seek success under circumstances which require excellence of performance?

AI = Achievement Imagery—There are four ways in which the Achievement Motive manifests itself most clearly. Thus, in every story, you should look for evidence of:

- desire for success in competition with others;
- competition with a self-imposed standard of excellence;
- involvement in unique accomplishment; or
- long-term involvement in achieving a goal.

If one of the four is present in the story, score the story plus one (+1) for AI. If none of these is present in a story, no further scoring for Achievement Motivation is possible. If AI is present in the story, additional scoring for Achievement motivation may be assigned, for the presence of the following subcategories:

N = Stated Need for Achievement: Someone in the story explicitly states the desire to meet an achievement goal.

A = Activity: Action is taken in the story towards achievement of the goal.

Ga+ = Goal Anticipation, Positive: Someone in the story thinks about or anticipates reaching the achievement goal.
N = Stated Need for Achievement: Someone in the story explicitly states the desire to meet an achievement goal.

A = Activity: Action is taken in the story towards achievement of the goal.

Ga+ = Goal Anticipation, Positive: Someone in the story thinks about or anticipates reaching the achievement goal.

Ga- = Goal Anticipation, Negative: Someone in the story thinks about failing to reach the achievement goal, or doubts he will reach it.

Bp = Block, Personal: Some characteristic of a person in the story will be a block to his achievement.

Bw = Block, World: Something in the environment is mentioned in the story as a block to achievement.

H = Help: The person with an achievement goal receives aid or encouragement from someone else in the story.

F+ = Positive Feeling: The person is pleased when an achievement goal is reached.

F- = Negative Feeling: The person is discouraged when an achievement goal is not reached.

Th = Theme: The entire imaginative story concerns achievement thoughts and activities.

An imaginative story may be scored an additional plus one (+1) for each of the
<table>
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<tr>
<th>story #</th>
<th>AI</th>
<th>TI</th>
<th>UI</th>
<th>N</th>
<th>A</th>
<th>Ga+</th>
<th>Ga-</th>
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**Achievement Scoring Sheet**
Affiliation Motivation—The Three Clear Signs

Prime Test: Determine whether one of the characters wants to establish, maintain, or restore a close personal relationship or friendship with another person.

AfI = Affiliation Imagery—There are three ways in which the Affiliation Motive manifests itself most clearly. Thus, in every story, you should look for evidence of:

1. a strong feeling of warmth and friendliness;
2. a social setting or situation that is warm and friendly; or
3. a feeling of concern for the disruption of a relationship that had apparently been warm and friendly.

If one of the three is present in the story, score the story plus one (+1) for AfI. If AfI has been scored, it is possible to score for affiliation subcategories similar to, but not identical to, the subcategories identified with the Achievement Motive.
Power Motivation—The Three Clear Signs

Prime Test: Determine whether any of the characters in a story desires to influence, or control the means to influence others.

PI = Power Imagery—There are three ways in which the Power Motive manifests itself most clearly. Thus, in every story, you should look for evidence of:

. emotions which relate to the gaining or maintaining of influence, or a position of power;

. actions through which a character seeks to consolidate a position of power, or to gain control over another character; or

. an implied, traditional power relationship.

If one of the three is present in the story, score the story plus one (+1) for PI. If PI has been scored, it is possible to score for power subcategories similar to, but not identical to, the subcategories identified with the Achievement and Affiliation Motives.
Note that the score obtained by summing across what we may now call components of competence to predict success at that activity does not look anything like an internally consistent factor score or a score derived from an IRT-based test.

In fact it looks like a multiple regression equation designed to help predict success at the selected kind of activity.
No wonder it did not go down well with conventional psychometricians ... who never looked at the relevant publications anyway.
Right. So. It seems that, if one wishes to index the kinds of competence we spoke about earlier what one needs to do is to extend the grid.

And that is precisely what we have done.
### Examples of components of effective behaviour.

**Cognitive**

Thinking (by opening one's mind to experience, dreaming, and using other sub-conscious process) about what is to be achieved and how it is to be achieved.

Anticipating obstacles to achievement and taking steps to avoid them.

Analysing the effects of one's actions to discover what they have to tell one about the nature of the situation one is dealing with.

Making one's value conflicts explicit and trying to resolve them.

Consequence anticipated:
- **Personal**: e.g., “I know there will be difficulties, but I know from my previous experience that I can find ways round them.”
- **Personal normative beliefs**: e.g., “I would have to be more devious and manipulative than I would like to be to do that.”
- **Social normative beliefs**: e.g., “My friends would approve if I did that”; “It would not be appropriate for someone in my position to do that.”

**Affective**

Turning one's emotions into the task:

Admitting and harnessing feelings of delight and frustration, using the unpleasantness of tasks one needs to complete as an incentive to get on with them rather than as an excuse to avoid them.

Anticipating the delights of success and the misery of failure.

Using one's feelings to initiate action, monitor its effects, and change one's behaviour.

**Conative**

Putting in extra effort to reduce the likelihood of failure.

Persisting over a long period, alternatively striving and relaxing.

**Habits and experience**

Confidence, based on experience, that one can adventure into the unknown and overcome difficulties. (This involves knowledge that one will be able to do it plus a stockpile of relevant habits.)

A range of appropriate routinised, but flexibly contingent behaviours, each triggered by cues which one may not be able to articulate and which may be imperceptible to others.

Experience of the satisfactions which have come from having accomplished similar tasks in the past.
Examples of components of effective behaviour.

Cognitive

Thinking (by opening one's mind to experience, dreaming, and using other sub-conscious process) about what is to be achieved and how it is to be achieved.

Anticipating obstacles to achievement and taking steps to avoid them.

Analysing the effects of one's actions to discover what they have to tell one about the nature of the situation one is dealing with.

Making one's value conflicts explicit and trying to resolve them.

Consequence anticipated:
Personal: e.g. "I know there will be difficulties, but I know from my previous experience that I can find ways round them.

Personal normative beliefs: e.g. "I would have to be more devious and manipulative than I would like to be to do that.

Social normative beliefs: e.g. "My friends would approve if I did that": "It would not be appropriate for someone in my position to do that."
Examples of components of effective behaviour.

**Affective**

Turning one's emotions into the task:
Admitting and harnessing feelings of delight and frustration:
using the unpleasantness of tasks one needs to complete as an
incentive to get on with them rather than as an excuse to avoid them.

Anticipating the delights of success and the misery of failure.

Using one's feelings to initiate action, monitor its effects, and change
one's behaviour.

**Conative**

Putting in extra effort to reduce the likelihood of failure.

Persisting over a long period, alternatively striving and relaxing.
Examples of components of effective behaviour.

**Habits and experience**

Confidence, based on experience, that one can adventure into the unknown and overcome difficulties. (This involves knowledge that one will be able to do it plus a stockpile of relevant habits).

A range of appropriate routinised, but flexibly contingent behaviours, each triggered by cues which one may not be able to articulate and which may be imperceptible to others.

Experience of the satisfactions which have come from having accomplished similar tasks in the past.
In a sense, we used this framework as it emerged to guide the open ended enquiries summarised earlier. It was a circular process.

In the process we noticed that the generic titles across the top really do not work. For example, people who focus on one type of achievement are not necessarily attracted by other types of achievement activity.
And we noted things about the kinds of environment which facilitate people’s use of the environment to hone the components of competence they need to pursue them.
Just notice one thing: all the motivational dispositions listed across the top end in “ing”.
The problem now is first to refine this list of possible motivational dispositions.

Factor analysis is not going to help us because the dispositions are idiosyncratic.
What we need is something like Linnaeus’s framework for classifying species or the periodic table used to arrange chemical elements in a meaningful way.

And then we need to refine the list of components of competence down the side.
To illustrate the difficulty of moving forward I should tell you what happened when Lyle Spencer set out to publish a book which would do this.

Perhaps Rene and his colleagues – or one of you – will take up the challenge.
Raven Seminar Prague

Background material
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