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NOTES: RESEARCH PLAN

The diagram on page 2 is a reasonably complete collection of research/applied items for consideration in the overall plan for the Cognitive Sciences Program. The items are not necessarily independent, nor are they intended to be the final word. In addition, they are in random order of priority. In short, this "straw-person" will serve as points for discussion.

This document includes comments on each of the items shown on page 2.

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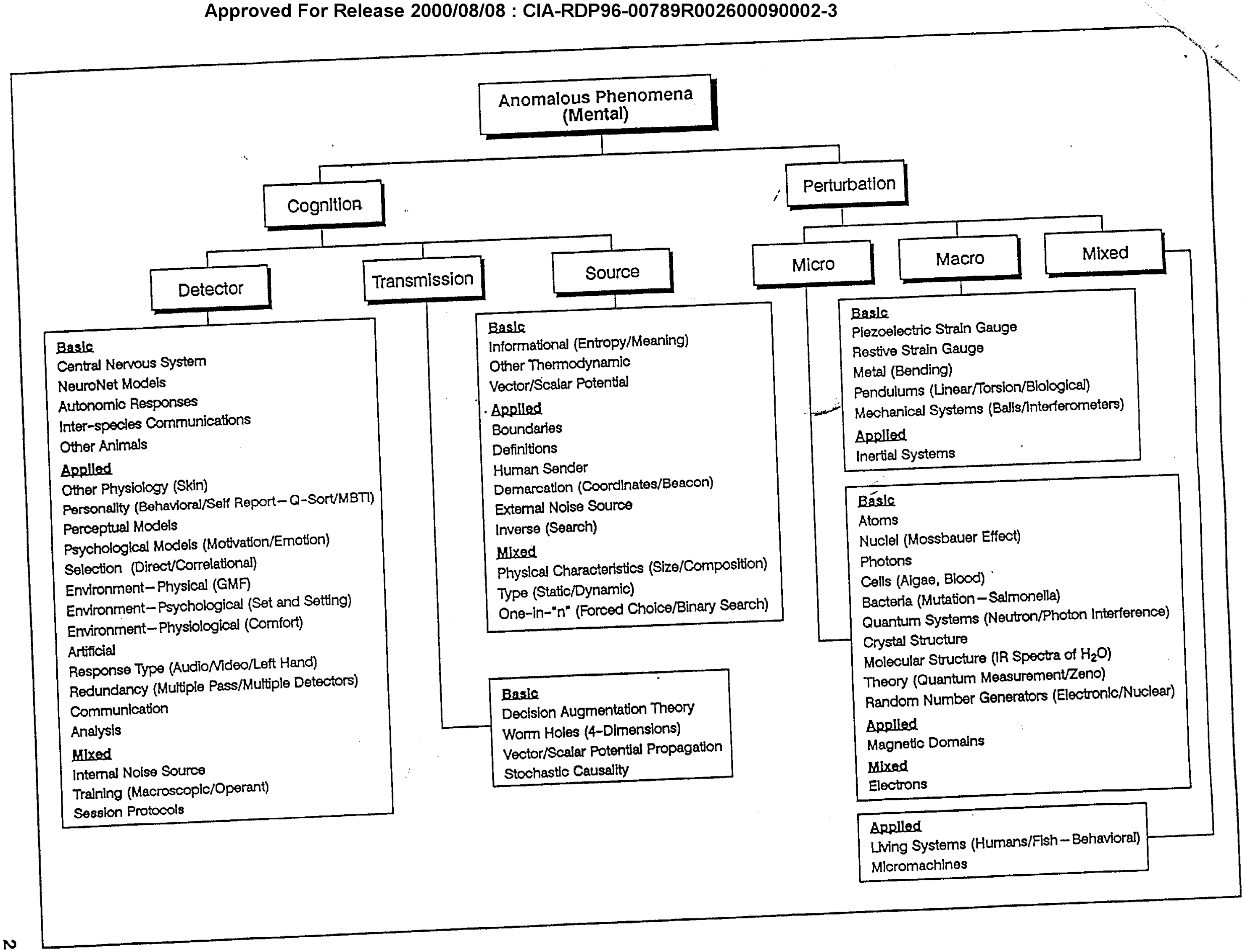

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1. Anomalous Cognition

Anomalous Cognition (AC) is described within the context of a sensorial analogy. Information about the *source* propagates via some *transmission* mechanism to a *detector*. In this model, the detector is usually thought of as human, but other animals or machines could possibly be used. The research items are divided into three broad categories; (1) Basic—primarily to understand the phenomena, (2) Applied—primarily to improve the output of AC experiments, and (3) Mixed—both basic and applied.

1.1 Detector

For human detectors, basic research involves internal physiological/physical mechanisms. For the point of discussion, all other variables (e.g., environment, psychology, etc.) can be thought as contributors to the detector efficiency and fall under the applied domain.

1.1.1 Basic

1.1.1.1 Central Nervous System (CNS)

The central nervous system is the centerpiece for the detector basic research. It is important to identify all possible sources of artifact in the previous pilot study and to replicate the earlier α–phase shifts. Once an effect can be verified, the next step is to identify specific evoked responses to remote stimuli. One technique is to use a classical conditioning protocol to "train" the visual system to respond to a direct (i.e., in the ears of the subject) audio stimulus. If this can be accomplished, it is a simple addition to intermix direct audio stimuli with remote and sensorially isolated audio stimuli. The advantage here is that the visual system's response to the local audio stimuli can be used to search for a similar signal in a potentially noisy response to a remote audio stimulus.

Another interesting potential is to examine sensorially handicapped individuals. For example, is it possible to observe an ERF to an AC stimulus with someone who was blind from birth. In addition, we could look at individuals who became blind at different times in life. We could also consider split–brain individuals, and people with varying degrees of lateralization.

1.1.1.2 Neuronet Models

Neuronetwork technology is enjoying limited success in understanding traditional sensorial processing. This research item is intended to explore that particular success applied to AC perception.

1.1.1.3 Autonomic Responses

All known senses appear to respond to external stimuli initially below the level of conscious awareness. In the visual system, for example, a hard–wired response to photons striking the retina occurs approximately 100 ms after the on–set of the stimuli. Can a similar response to AC stimuli be identified? Can that autonomic response be used to reduce noise in the overall response?

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1.1.1.4 Inter-species Communications

Can AC be used to direct the behavior of members of other species? Are some species better communicators than others?

1.1.1.5 Other Animals

If an autonomic response (or AC-evoked response) can be identified in humans, it is very likely that such a physical sensorial system would not be unique to humans. What other animals possess similar sensorial systems. One might argue that "lower" animals might require AC as a survival mechanism more than humans to. MEGs routinely are used in animal studies.

1.1.2 Applied

1.1.2.1 Other Physiology (Skin)

William Braud at the Mind Science Laboratory has been demonstrating electrodermal activity (EDR) in humans in response to AC stimuli. Can variations on this theme be used to identify correct from incorrect elements in a verbal AC response.

1.1.2.2 Personality (Behavioral/Self Report—Q-Sort/MBTI

The search for personality that is predisposed toward a natural AC ability has been one of the major efforts in research parapsychology. (Hint: Thus the name.) Not surprising, however, to first order it has failed. (No slur intended—it is a *very* difficult problem!) Self-report (i.e., ask the person to answer tricky personality-revealing questions about him/herself) methods are very unreliable. However, the Meyers Briggs Type Indicator (MBTI) and the Q-Sort have shown some statistical significant results, but the reliability has been poor. We have examined, in detail, a promising behavioral technique (i.e., ask the person to do things rather than answer questions) called the Personality Assessment System. The PAS has enjoyed great success in certain government applications, and while it is difficult to administer, it continues to be promising to help us in the selection problem.

Another approach to this general problem is to examine independent measures of various types of creativity to search for correlations with AC functioning.

1.1.2.3 Perceptual Models

Are there developed and standard models of perception that can help in understanding AC perception? For example, the parallel between subliminal perception, of which much is known, and AC perception, of which little is known, is striking. Can subliminal training techniques be ported to the AC domain?

1.1.2.4 Psychological Models

As the name parapsychology also implies, much has been done in attempting to construct/apply psychological models to understanding AC. Standard models have not been particularly successful in describing non-AC behavior and thus its application to AC is problematical. Some success with

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extroversion/introversion scales has been observed, but I think it is driven mainly by the AC-data collection technique rather than anything basic to the functioning.

1.1.2.5 Selection (Direct/Correlational)

How are individuals, who possess a natural AC-ability or are susceptible to training, found? An example of a *direct* method is simply to ask many people to participate in an AC experiment and pick the best. This is particularly inefficient (i.e., approximately 1%). One promising *correlational* technique is that high scoring individuals on the Stanford Hypnotic Susceptibly Scale are also good AC detectors.

1.1.2.6 Environment—Physical (GMF)

Interesting new analysis of the geomagnetic field (GMF) has shown some weak correlation with AC ability. Is this real and can it be used to enhance the output quality? Are there other physical correlates? In addition, are there other mental and/or physical human activities that correlate with the GMF or related phenomena (e.g., DST—Change in Storm Time).

1.1.2.7 Environment—Psychological (Set and Setting)

The field of environmental psychology deals with understanding the impact of our near-environment on human performance (e.g., color of the walls, music). Are there other aspects of the so-called setting that are important (e.g., lack of clutter)? The psychological set determines how the staff interact with the participants. What role do white lab coats play? Previous research has shown that a warm, supportive and inviting persona is important, but "touchy-feely" is too much. What are the important variable to illicit excellent AC functioning?

Are there variable with known diurnal variations that correlate with AC functioning?

1.1.2.8 Environment—Physiological (Comfort)

Some of the obvious variables are: temperature, humidity, hunger and body stress. Are there more subtle issues (e.g., left hemisphere distraction) that can improve the functioning?

1.1.2.9 Artificial

Can a machine/computer be taught to detect AC data? How can current expert systems be applied to understanding AC phenomena?

1.1.2.10 Response Type (Audio/Visual/Left Hand)

Traditional AC responses have been mostly written and drawn. These methods are not necessarily optimal information processing modes for all people (e.g., some people can describe verbally better than in writing). If AC functioning is predominantly a right-brain activity, asking highly lateralized people to write/draw with their left hands may give more accurate responses.

One variation on this theme was developed by Budzinski. He found that "simple" right-brain messages were better "understood" if the left-brain was occupied. Can this technique be adapted to AC experiments.?

1.1.2.11 Redundancy (Multiple Pass/Multiple Detectors)

Little formal investigation of redundancy appears in the literature. Sophisticated fuzzy-set analysis provides a legitimate method of applying redundancy.

1.1.2.12 Communication

AC techniques have been used in the past to "send" messages with 100% accuracy (e.g., a single 50-bit binary message was flawlessly sent using a multiple pass procedure). Can modern and efficient techniques (e.g., sequential sampling) improve the efficiency of such systems?

1.1.2.13 Creativity

Do independent measures of various creative abilities correlate with AC functioning.

1.1.2.14 Analysis

The development of analysis techniques for AC data has traditionally been a major part of the Cognitive Sciences Program. Simple techniques such as rank-order have the advantage of being understood by everyone, but those same techniques grossly underestimate the information transfer bit-rate. Yet complicated techniques such as fuzzy set analysis are difficult to understand and thus are prone to criticism. Nonetheless, adaptive fuzzy set analysis has been shown to be very promising in developing a person-dependent lexicon that can significantly improve the AC measure.

Can neuronetworks and/or genetic algorithms be applied to the fuzzy set approach to AC analysis?

1.1.3 Mixed

1.1.3.1 Internal Noise Source

The general problem of "internal" imagery is a current and major topic in traditional cognitive science. With some limited success AC practitioners have been able to separate internally generated "noise" from target-related data. Can we improve on this? What training from traditional cognitive sciences can be adopted?

1.1.3.2 Training (Macroscopic/Operant)

Training has been particularly difficult. The good news is that we have *not* observed a so-called decline effect (i.e., subjects start well and converge to the mean), but we also have not generally been able to demonstrate learning. By macroscopic I mean specific protocols—lesson plan. By operant I mean can response-neurons (hopefully identified in item 1.1.1.3 above) be trained by biofeedback techniques to improve the quality of AC data?

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1.1.3.3 Session Protocols

Session protocols is a general area that includes feedback parameters, session structure (i.e., how long, how often, technique), and data knowledge (i.e., who knows what when). Another important aspect of session protocol is when does the session begin and/or end?

One test of this is the "hooded" feedback protocol. In the falcon experiment, the AC participant is blindfolded jest after the session. With possible variations on a theme, the blindfold is removed at specific times during a physical visit to the target site. Some the sites revealed are decoy targets and occur before and after the actual feedback target.

1.2 Transmission

Understanding how data propagates from the source to the detector is a basic research problem. One driving issue is that precognition (i.e., data is received *before*—in 3-space—the source emits it) is real.

1.2.1 Basic

1.2.1.1 Decision Augmentation Theory

Decision Augmentation Theory (DAT) portents that the usual decision processes are augmented by statistical amounts of information–leakage from the future. One application of this model to 15-years of random number generator data has been particularly successful. The model should be expanded and tested in a number of different experimental domains.

1.2.1.2 Worm Holes (4–Dimensions)

Recent research in general relativity has suggested the possibility of *realizable* time travel through worm holes in the 4–D manifold. A boundary condition that emerged is that causality must be stochastic—not unlike the conclusion forced by the precognition data. What is needed is some smart GR theorist to calculate things for us.

1.2.1.3 Vector/Scalar Potential Propagation

The E&M vector/scalar (A,Φ) potentials are under intense investigation. After the Aharonof (sp?) /Bohm effect demonstrated that A,Φ are fundamental aspects of E&M theory, it is hoped that A,Φ waves could propagate. To date, theory and experiments have not confirmed such propagation. However, *if* there were a possible A,Φ propagation, it is likely that its properties would emulate some aspects of AC. Thus we should look into it.

1.2.1.4 Stochastic Causality

Besides worm holes in 4–D, are there other implications of stochastic causality?

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1.3 Source

The source of AC data has implications for basic and applied research. To date, no quantitative definition of the source exists. Characterizing the source is the topic under discussion.

1.3.1 Basic

1.3.1.1 Informational (Entropy/Meaning)

Informational entropy is a macroscopic aspect of the source (i.e., target), whereas meaning is a perceptual aspect of the target. (It occurs to me at this writing, meaning cannot be a target property!) By entropy, I mean Shannon type at this early stage of the thinking. Is there a form of "collected" entropy or information compression that can be adapted to AC target descriptions?

1.3.1.2 Other Thermodynamic

Can classical thermodynamics teach us about the limitations of the information transfer from the source? We can not assume at this stage that information transfer occurs without energy transfer. What are the thermodynamic consequences of this?

1.3.1.3 Vector/Scalar Potential

Specifically, what are the source requirements that might emit A, Φ waves?

1.3.2 Applied

1.3.2.1 Boundaries

What are the source boundaries? Are they hard-edged (probably not)? From a pragmatic point of view, the judge must determine where to stop the analysis. For example, if the Golden Gate Bridge is the target, does the City of San Francisco count since it is visible from the bridge?

1.3.2.2 Definitions

Traditional AC research has focused on visual and or functional aspects of the target. There are other dimensions that may be important. What are optimal target definitions for all these domains?

1.3.2.3 Human Sender

In the so-called telepathy mode, the source information is "transmitted" by the mind of an observer. A major amount of data (i.e., the Ganzfeld) has been collected under this assumption. It is obviously not a *necessary* condition in that most of the SRI AC data was collected without a human sender, but to what degree is a "sender" involved?

1.3.2.4 Demarcation (Coordinates/Beacon)

The universe is a near-infinite collection of potential targets. How is the intended target to be specified? Virtually everything that has been tried (e.g., beacon, coordinates, encrypted coordinates, abstract words, etc.) have been successful. What does this mean? Are some better than others? Why?

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1.3.2.5 External Noise Source

Once the source of AC data has been identified, targets can be selected on the bases of the lack of noise located at the source. Can this type of noise be used as masking?

1.3.2.6 Inverse (Search)

The forward direction for AC experiments involve the demarcation of a target in an attempt to obtain information about it. The inverse problem (i.e., as in physics, a very difficult one) involves giving all information about the target except is demarcation. Where is that target?

1.3.3 Mixed

1.3.3.1 Physical Characteristics (Size/Composition)

Are atoms "visible" via AC techniques? How can mixed-sized targets be optimally detected?

1.3.3.2 Type (Static/Dynamic)

Are there specific target types that constitute "easier" AC sources? If so, why?

1.3.3.3 One-in-"n" (Forced Choice/Binary Search)

In early experiments (*circa* 1930s), most of the effort involved guessing a target symbol from a limited set (usually 5). There is a massive database that shows consistent statistical evidence for an anomaly, but the effect size is quite small (e.g., 0.02). There are a number of possibilities for this. Maybe there is a basic research reason such as entropy. There are internal reasons as well. For example, when an individual knows the set of targets, strong internal imagery results from memory and imagination that masks a putative AC signal.

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2. Anomalous Perturbation

Anomalous perturbation (AP) is the putative mental interaction with the physical world. Generally, the potential target systems are divided into two size domains, micro and macro. Most of the items shown under Perturbation on page 2 have been used as AP targets. As I have said many times before, the literature is inconclusive mostly in that the researchers are simply unaware of potential confounding influences.

Research of AP should begin with an attempt to define more specifically what will be accepted as a genuine AP effect. In parallel, detailed calculations should be conducted on specific historical experiments to identify possible "normal" perturbations that may have occurred.

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