# Philosophical Foundations of Business Research

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# Part One: Concept Analysis

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Part One: Concept Analysis

## Chapter 1 – Introduction to the Doctoral Programs in Business

**Why Be a PhD?**

Doctoral programs can be grueling. They can challenge students to their intellectual and emotional limits. So why would anyone want to do something like this? In order to answer that question we have to understand what it means to be a PhD. Note, first, that a PhD is not just a degree that you earn it is something you become. This distinction often applies to professional degrees but not other academic degrees. For example, if somebody goes to medical school but never practices medicine, you could say that they have a medical degree but it would be a stretch to say they are a doctor. Similarly, if somebody goes to law school but never practices law one might say they hold a law degree but that they are not an attorney. This distinction does not typically apply to master's degrees in academic fields. One may, for example, have a master's degree in computer science but it is unlikely that they would say they have a degree in computer science but are not a computer scientist. For some reason the expectation of practice does not come with other academic degrees so people do not make this distinction. But the expectation of practice does come with a PhD. And that practice is the practice of research. If one holds a PhD but does not do research then it would be appropriate to say that the hold a PhD but are not really a PhD. This distinction is not typically made explicitly but it is important and does reside in the minds of most academics. The point is that a PhD is a research degree. You are being trained to do research with the expectation that you will do research. What is research? We will get to that question directly. But first a few words of explanation on why doctoral programs are different than master's level degree programs.

Although the following characterization is not a hundred percent accurate, it does carry a useful sense of what various levels of education are about. In high school one learns the basics that are necessary for functioning in a literate society. In undergraduate school you are introduced to new ideas and encouraged to think for yourself. In graduate school you master concepts that you were introduced to at the undergraduate level. You are not so much seeing new ideas as seeing greater depth in the ideas to which you have already been exposed. At all the levels, it is assumed that the knowledge is already out there and it is the responsibility of the student to learn it. But that changes at the doctoral level. The assumption of the existence of knowledge is dropped and the focus turns to the creation of new knowledge. A person with a PhD degree is expected to be able to advance the knowledge in their field by creating new knowledge. This is a big change from receiving existing knowledge to creating new knowledge and for many it makes the focus of a doctoral program difficult to understand. Many students see a PhD program as just another degree. You take some classes. You pass some tests. And you get a degree. But it is not at all like that. Instead, you learn how to create knowledge. You create some knowledge. You demonstrate that you have created knowledge. And THEN you get the degree. This misunderstanding is so wide spread that many people carry the designation ABD (All But Dissertation) after their name to show that they embarked on a doctoral program and did all the course work but failed to do a dissertation. The fact that this is so common shows the extent to which doctoral programs are misunderstood. The point of a

doctoral program is to do a dissertation because the dissertation is where you demonstrate your ability to produce knowledge. Having ABD after your name would be like an undergraduate who flunked out putting DAC (Didn't Attend Classes) after their name. Nonetheless, this widespread confusion about the nature of doctoral programs has led to a variety of revealing metaphors and analogies that attempt to expose the differences between doctoral studies and pre-doctoral education. Following are a few of my favorites.

**Some Metaphors**

We use metaphors to describe one thing in terms of another, usually describing a poorly understood phenomenon in terms of a better understood phenomenon. The use of metaphors is usually an indication that a phenomenon is not well understood and metaphors are useful only to the extent that they faithfully represent the phenomenon in question. Nonetheless, setting aside the weaknesses in using metaphors, following are some that I have heard and used in the past to describe the journey of doctoral students.

The Iliad and The Odyssey

Some people see the Iliad and the Odyssey as a metaphor for life. In your earlier years you prove yourself to society as was the theme in the Iliad. Heroes demonstrated their worthiness according to well defined modes of conduct. But, in the Odyssey, everything changes. There are no rules, only tests. The lost Odysseus faces a series of challenges where notions of right and wrong are no longer available to guide him. He survives or fails to survive on his own wits, cunning and sense of survival. In many ways this serves as an adequate metaphor for a doctoral program. During the coursework and comprehensive examination phase the student proves himself or herself as a worthy candidate. The expectations may be high but they are usually also fairly clear. Once the student completes the coursework phase they go on to the odyssey of dissertation research. Here the rules are much less clear. The students are cast into an unstructured arena where they must survive based upon their wits, cunning, and sense of survival. Nobody can tell you what to do for your dissertation. This is something you have to figure out for yourself. The good thing about the dissertation phase as odyssey is that it prepares students for an academic career which becomes one long extended odyssey. The bad thing is that nothing that happens in the Illiadic phase really prepares the student for the Odyssey.

Rain Forest

The Iliad and Odyssey analogy reflects the difference between the structured coursework portion of a doctoral program and the unstructured phase of dissertation research. But it does not explain why the research phase is so unstructured. For this, the Rain Forest analogy provides some insight. Imagine that you have spent you entire life living in an urban area (such as Foggy Bottom). Further, imagine that you have had all of your meals catered. When you are hungry you pick up the phone, call a vendor and food is delivered to your place of residence. Then one day in a moment of bold impulsiveness you join a survivalist group. After some training they drop you in the middle of a rain forest with

instructions to find food. They will return shortly, they explain, and when they return they expect you to have not only found food but they expect you to prepare a delectable banquette for six. There is no phone to call a caterer and you have no idea what is edible. But they do not waiver in their expectations and you have to find food and figure out how to prepare it.

Food represents knowledge in the Rain Forrest Analogy. As we go through the educational system, knowledge that has been prepared by somebody else is presented to us in classes and through textbooks. It gives us the false impression that knowledge exists, out there in the world, in some refined format and all we need to do is find it. But knowledge does not exist in refined format any more than hamburgers or sushi grow on trees in the rain forest. In order to survive in the rain forest we must learn where food comes from and learn how to prepare it. In order to survive in a doctoral program we must learn where knowledge comes from and how to turn it from its raw form into a form that is transmittable to others.

Eight Minute Mile

This next analogy attempts to explain the nature of success in a doctoral program. Success is not sitting in a certain number of classes or reading a certain collection of articles. Success is demonstrating that you are capable of doing research and creating knowledge. So imagine, analogously, that you wish to join a track team and the requirement for joining is that you be able to run an eight minute mile. You can take classes and read books. You can get to know the coaches and other runners. You can hang around the track and socialize. You can attend running seminars and so on. You might pick a coach to train with that is easier on you and with whom you get along well with. But ultimately the test will be whether or not you can run an eight minute mile. If you do you make the team. If you do not, you won't make the team. This analogy emphasizes the performance requirement of doctoral program. When all is said and done you will either be able to demonstrate your ability to do research or you will not. Ultimately, the number of classes you took, the number of books and articles you read, the number of friends you make with faculty or other doctoral students will not matter. Either you will produce research or you will not. The eight minute mile analogy suggests that it is best to stay focused on the goal and not get distracted with pseudo goals, because, at the end, you will either perform successfully or you will not.

## What is Research?

Informally, research is a process by which we learn more about the world around us. Why would we want to know more about the world around us? There are three reasons. First, the more we know about the world around us, the more control we can have over the world in which we live. Second, the more we know about the world, the better decisions we can make about how to spend our time, money and other resources to bring about outcomes that we feel are desirable. And third, we like to know about the world around us because nature has endowed us with a natural curiosity that can only be satisfied by the acquisition of, *apparently*, orderly and reliable knowledge. I included the word *apparently* because, in order to satisfy our curiosity, knowledge only needs to *appear* orderly and reliable. And that *appearance* often interferes with the first two objectives.

There is no shortage of examples on this point. We have myths, folktales, legends and any number of other descriptive narratives that are orderly in that they do help us organize our experiences and are reliable in that they continue to be satisfying over generations. But they do not help us to engage the world around us to produce more desirable outcomes. These descriptive narratives serve to satisfy our curiosity and, in doing so, make us feel better while providing little help in gaining control over our destinies. We often feel that mythology is a product of the past and that modern thinkers are no longer vulnerable to the seduction of myths. But, if we use the original meaning of myth which was simply the commonplace unexamined talk of ordinary people we can easily see that we still engage in the production of myths today. In a business environment we might call this 'water cooler' talk instead of myth making. Water cooler talk is the unexamined chit chat that occurs around the water cooler as people talk for purposes other that gaining a true understanding of the world around them. They may be talking to establish hierarchy or status. They may be talking to share values. They may be talking to organize the workplace into informal coalitions of like minded people. They may be talking for any number of reasons, but gaining a more accurate understanding of the world around them is not one of those reasons.

This is the point at which a researcher becomes separated from the ordinary person. The ordinary person's knowledge is typically unexamined. This is to say that it is accepted at face value. It is untested and hence not validated. It is often inconsistent, imprecise and frequently just plain wrong. The ordinary person believes things like: You can get a better deal on a car if you buy it in June; Hard work pays off; Politicians can't be trusted; A Penny Saved is a Penny Earned; and so on. Are any of these things true? Who knows? They are the stuff of unexamined belief systems. And when one becomes a researcher they develop a lot less tolerance for unexamined belief systems. The role of research is to test and hence harden our knowledge about the world. It is an intellectual perspective that, once developed, forever sets the researcher apart from the ordinary person.

## How Reliable is Our Knowledge?

I would like to begin by setting the tone for this course by asking the question – how reliable is our knowledge about the world? This is a question that has plagued philosophers ever since the very beginning of philosophy. Plato was greatly disturbed over the fact that the constituents of the material world were inconsistent with a wide degree of variation. There are no two trees that are exactly alike so how can we make any statements at all about trees? The material world is characterized by inconsistency and variation. And yet we still attempt to make statements about it. The social world, which is the focus of business research, it characterized by far more inconsistency and variation. So, how do we obtain any knowledge at all? The answer is that we group things together based on similarities and then attempt to make statements about the members of the group we have created. Of course, in the process of grouping things based upon similarity, we encounter two of the most profound problems in metaphysics: The Concept of Identity and the Problem of Universals. Understanding these two problems makes the process of grouping things based upon similarity much more effective. And it makes any statements made about those groups much more reliable. These concepts will be discussed, in much greater detail, in future chapters.

Rene Descartes was also deeply concerned about the reliability of knowledge. He was as skeptical of sense knowledge as was Plato for many of Plato's reasons and more. Descartes pointed out that we can experience sense knowledge that seems real even if it has little or no basis in reality such as dreams, hallucinations, or even subtle illusions. How, then, do we sort out reliable sense knowledge from unreliable sense knowledge? Perhaps we can't. So, Descartes preferred to rely on reason instead. In his famous observation Cogito Ergo Sum (I think therefore I am) Descartes felt that he could prove his own existence based on the fact that if he could doubt his own existence then there must be somebody doing the doubting. This is, of course, an oversimplification and we will discuss this in more detail later. But it does go to show that there are problems with knowledge that have vexed some of the greatest minds in the history of philosophy.

And, the problems with knowledge are no longer the exclusive domain of philosophers. Cognitive scientists have also jumped into the fray looking at the reliability of our perception and cognition. Michael Gazzaniga provides a very revealing story about how one function of the brain is to automatically generate explanations given a set of data.

> "The patient is shown two pictures, one exclusively to the left hemisphere and one exclusively to the right, and is asked to choose, from an array of pictures in full view, the one associated with the pictures presented to the left and right brain. In one classic example of this kind of test, a picture of a chicken claw was flashed to the left hemisphere and a picture of a snow scene to the right hemisphere. Of the array of pictures, obviously correct association was a chicken for the chicken claw and a shovel for the snow scene. In this experiment the patient responded by choosing the shovel

with the left hand and the chicken with the right. When asked why he chose these items, he (actually his left hemisphere) replied 'Oh, that's simple. The chicken claw goes with the chicken, and you need a shovel to clean out the chicken shed.' Here the left brain, observing the left hand's response, interpreted that response in a context consistent with its sphere of knowledge – one that did not include information about the snow scene." [1988, pg. 12-13]

If the brain automatically generates ideas which may or may not be correct, how do we sort out the correct ideas from the incorrect ones?

Julian Jaynes provides a great example of the unreliability of consciousness. Imagine yourself as you were driving to class today. What do you see? You probably see yourself in the car from a perspective outside the car and a little above your head. Of course, as you were driving in you actually saw the dashboard of your car and the rear end of the car in front of you. What you are seeing when you think back is a mental reconstruction of the situation. Your consciousness automatically reconstructs situations for you filling in details and making sense out of things to the greatest extent possible. Since most of the time we reason based upon these conscious reconstructions how good can our reasoning actually be?

So, we have a material world that is inconsistent and widely varying. And we have a mind that is wholly unreliable in both perception and reason. And yet we wish to use that mind in order to make sense out of the chaotic world. How can we do that? The short answer is *Method*. Francis Bacon observed that *Method* is the path to knowledge whereas Genius provides the speed. Method without Genius will eventually get there. But Genius without *Method* may get to the wrong place much quicker. In this course we will look at the philosophical foundations of *Method*. Why do we pursue knowledge in the manner that we do? What things can we do in order to improve the quality of the knowledge we acquire? What mistakes have been made in the past that we can learn from? What mistakes are likely to be made in the future that we should try to avoid? Examining the philosophical foundations of business research will provide us with the conceptual framework for research which will, in turn, increase our chances of producing reliable knowledge.

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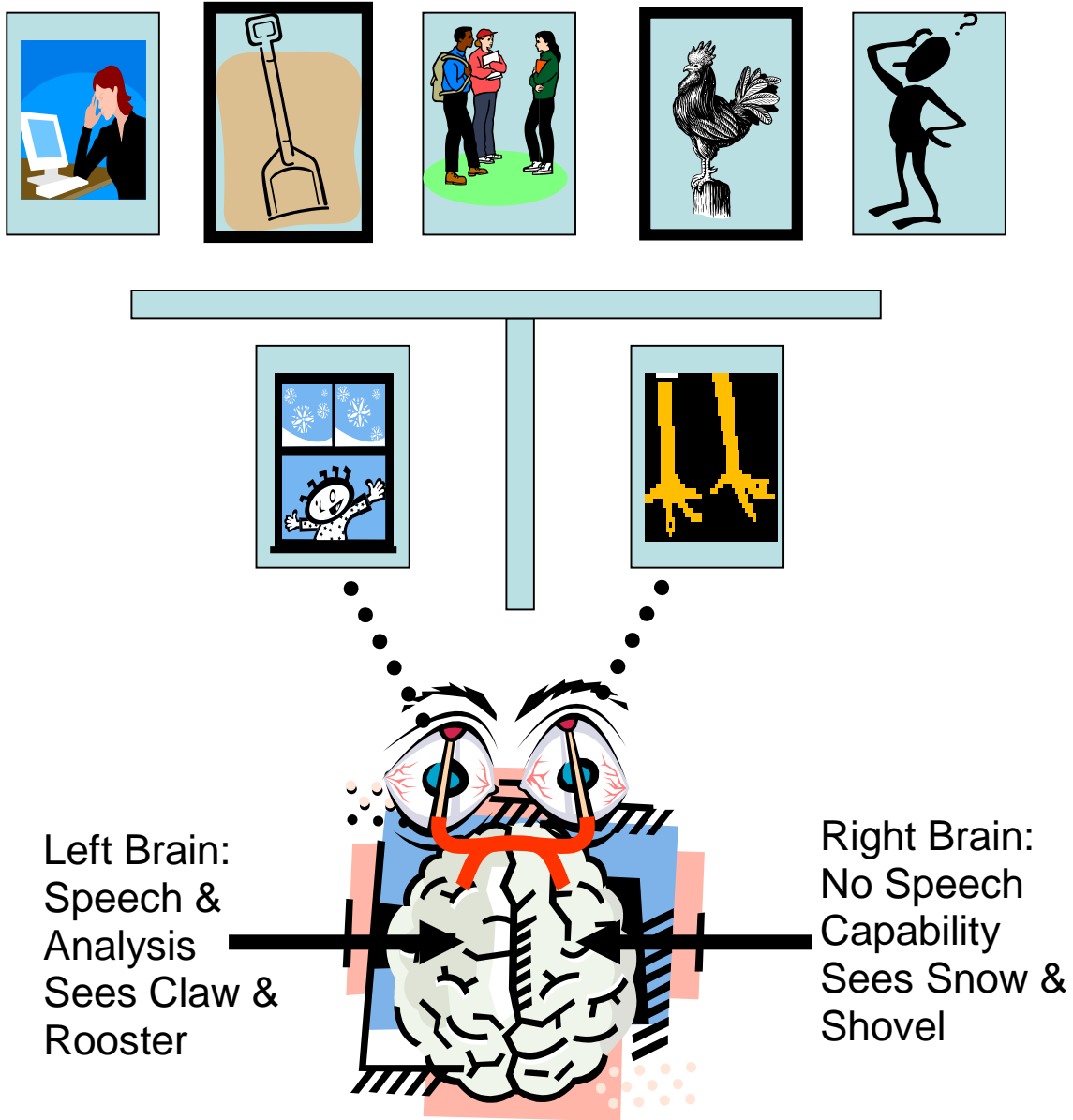
Figure 1: The Gazzaniga Split Brain Experiment Revealing Subconscious Belief Formation

Left Brain:
Speech &
Analysis
Sees Claw &
Rooster

Right Brain:
No Speech
Capability
Sees Snow &
Shovel

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## Chapter 2 - The Concept of Identity

**The Concept of Identity**

The Concept of Identity is one of the most fundamental concepts in philosophy. This deceptively simple concept is at the core of how we understand the world and of how we organize our knowledge about it. As we go about, in the world, we experience many, many things. We may experience the existence of objects. We may experience situations. We may experiences feelings or instances of a concept, such as fairness or justice, and so forth. It is simply not possible to remember every experience we have had and what we learned from that experience. Even if it were possible, remembering each individual experience would not allow us to extend our knowledge by applying what we learned in the past to things we encounter in the future. So, instead, we group our experiences of a certain kind together and remember things about the group. Further, if we encounter instances of this group in the future we can apply what we already know about existing members of that group to new instances of that group. This provides us with a high degree of intellectual economy and the ability to extend our knowledge from instances we have encountered to instances that we have not encountered. But, how do we group instances? Why not create a group that contains a tree, an experience of being slapped, and a memory of the first day at school? The answer is that we create groups that contain instances of things that are the same. But, what do we mean by 'the same'. And now we are into The Concept of Identity. In its simplest terms, the concept of identity addresses the question – what do we mean when we use the word "same". But in order to see the complexity of the concept, a few examples are in order.

**Diet Pepsi Example**

Suppose that you are going to the deli to buy a soda and your friend asks you to get her a diet Coke.

You come back with a regular Coke. She doesn't want it because diet Coke and regular Coke are not the same. So you go back to the deli.

When you get to the deli, you find that all they have is diet Pepsi so you get her one of those. When you return you find she is still upset because she asked for a diet Coke. And diet Coke and diet Pepsi are not the same.

You go back once again and get a diet Coke. But you get it in a 12 oz. can, whereas your friend asked for a 16 oz. bottle. "They are not the same," she replies.

You go back one last time and get two 16 oz. bottles of diet Coke, one for you and one for her. You hand her one and keep one for yourself.

"There, a 16 oz. diet Coke in a bottle," you proclaim proudly. "In fact, I got myself the same thing."

"Are you saying that your diet Coke and my diet Coke are the same thing?" she asks.

"Of course they are," you reply, looking both over carefully to make sure that you have not missed some subtle difference.

"But how can the same thing be in two places at the same time?" she asks.

At this point you have to give up having friends or learn a little more about philosophy.


**The Old Acquaintance Example**

This time assume you have run into a person that you recognize from sixth grade. Perhaps you recognize his name, or a mutual friend has pointed him out to you.

But, whatever the reason, you introduce yourself and refresh his memory of the fact that the two of you were great friends back in sixth grade.

After a long talk getting reacquainted your old friend say "Gosh, are you really the same person that I sat next to in sixth grade?"

"Yes", you reply. "Isn't it amazing?"

Then your old friend looks at you suspiciously and says, "I don't think you could be the same person. After all, that person was twelve years old and you are decades older than that."

At this point you want to say, "Well, I'm not the same, same person," as though repeating the word can somehow break through the semantic logjam.

But, the truth is that we use the word 'same' in many different ways and rely on the ambiguity of language to get us by. When the ambiguity is pointed out, we don't have the conceptual framework for sorting it out.


**The Laptop Example**

In this example, let's assume that a friend lends you her laptop computer while she spends a year traveling for some unspecified reason. During that year, the wireless adapter dies, the hard drive needs replacing, the display fizzles out and so on. In fact, every single component in the laptop fails and has to be replaced.

For reasons unknown to anybody including your self, you save all of the failed parts until finally you have enough failed parts to assemble a second laptop.

Your friend returns and asks for her laptop. You tell her the story about the failed parts and subsequent repairs. You then ask her which laptop she wants.

"I want the one I lent you," she responds.

"Well, then take this laptop that I made out of all of the failed components of the laptop that you lent me," you offer.

"But that isn't the same laptop," your friend replies. "The laptop I lent you was working."

"OK then" you capitulate, "take the other laptop."

"But that is not the same laptop that I lent you," she asserts. "It is a collection of new parts."

What do you do?

Subletting your apartment and moving into a cave away from all humanity is starting to look pretty good.


## Derivatives of the Concept of Identity

The Concept of Identity addresses the philosophical problems that arise when we create concepts based on essences and think about things in terms of the concepts of which they are an instance rather than their particular varying characteristics. The problems that arise can be grouped into three constituent problems that we will discuss in more detail.


1) The diet Coke example was an instance of the Problem of Universals
2) The old acquaintance example was an example of the Problem of Personal Identity
3) The laptop example was an instance of Persistence of Identity over Time.


## Exposition on Philosophical Problems

The first, involving the Pepsis and Cokes is an example of the Problem of Universals. The Problem of Universals, which may be the second most important problem in philosophy, addresses the problem of how do we group individuals into types and then assign attributes or characteristics to those types. This problem is at the very heart of all research. When we do research we are attempting to determine an invariant characteristic

of some category or an invariant relationship between two categories. How those categories come into being is an instance of the Problem of Universals.

Here is another way to look at the Problem of Universals. Imagine a person comes into class, points at somebody and asks, "Are you a student?" Consider the implications of the following possible answers:

1) "Yes."
2) "Yes, but not in this class."
3) "Yes, but not for long."
4) "No, I'm a professor."
5) "No, I'm just sitting in."
6) "No, I am an alumni auditor."

Each of these answers classifies the person in question into different categories. And each of these different categories carries implications regarding the person in question. We assign information and implications to categories and then assign individuals to those categories all in the name of intellectual economy. Hence, the Problem of Universals goes right to the heart of how we understand the world.

The second problem is the Problem of Personal Identity. How do you know who you are and are you the same person over time? What events might cause a discontinuity of personal identity and how significant are those events. Personal Identity is at the very heart of how our social interactions and responsibilities are structured. If I can claim that I am not the same person that I was yesterday then I can't be held responsible for any bills that the person yesterday accumulated. I can't very well be held accountable for a crime if it was committed by a different person. So discontinuities in Personal Identity would throw the whole criminal justice system into chaos. Use your imagination on this one. The possibilities are endless.

To see the Problem of Personal Identity a little more clearly, imagine that somebody wants to know if you are the same person that you were yesterday. How would your answer under the following conditions?

1) Nothing remarkable happened since yesterday
2) You experienced a profound religious awakening
3) Your 401K lost 30% of its value
4) You had a near death experience
5) You saw on the nightly news that yet another actor will be governor of California
6) A voice coming out of a burning parking meter told you that you should really pay attention in this class

The third example is an example of the Problem of Persistence in the face of change. Hericlitus, the pre Socratic Greek philosopher, said that you cannot step into the same river twice. Everything is in a state of change, according to Hericlitus. But if everything is constantly changing, how can you accumulate knowledge about things? Zeno the Stoic

had the opposite opinion. In a famous paradox that has come to be known as Zeno's Paradox, he shows that change is merely an illusion. Imagine that somebody shoots an arrow at you from several hundred feet away. Before the arrow hits you, it has to cover half of the distance between you and the archer. Then it has to cover half of the remaining distance, and half of the remaining distance again. Since the distance between you and the arrow can be halved infinitely many times, the arrow can never reach you. If it does, it is merely an illusion.

While the opinions of Heraclites and Zeno are somewhat extreme, they do point to some very practical problems in research. If you are doing research using focus groups, can you meet with the same group twice? Can you repeat experiments in the same organization? Is accumulated knowledge about a concept such as hierarchy valid over time or does the concept change so much that any accumulated knowledge is invalidated.

We can use a variation of the Personal Identity example to better understand the Problem of Persistence. Assume you are working with a group of four or five people on a class project. Which of the following circumstances would lead you to believe that the group at the end of the semester was not the same as the group at the beginning of the semester?

1) Two students dropped out after the first night
2) One student dropped out after the second night, but was replaced.
3) The group had a huge fight after the third night and didn't speak for two weeks. But then they resolved their differences and completed the project.
4) Around mid semester the group completely scrapped its project and started a new one.
5) Over the course of the semester that group members warmed up to each other and found ways to work together productively and harmoniously.

**Comments on the Concept of Identity**

Why is the concept of identity so crucial to our understanding of the world?

We cannot recall information about every single thing we encounter so we group individual instances together in groupings and maintain knowledge and information about the group.

We do this for the purpose of intellectual economy and the effectiveness of those grouping is directly related to the fidelity of our understanding of the world.

In addition, the concept of identity highlights the ambiguity of language which was exploited by the Sophists.

**The Concept of Identity Today**

We find the concept of identity at the heart of many social policy debates.

People who say "Abortion is murder" are really saying that abortion and murder are the same thing and thus should have the same penalty.

People who oppose same sex marriages are saying that a union between same sex couples is not the same as a marriage between a man and a woman. The fact that they believe it is not the same is reflected in the fact that attempts are made to come up with a different name such as civil union.

People who oppose the detaining of enemy combatants at Guantanamo feel that people are people. They are all the same and hence deserve the same rights. Others feel that they are not the same and hence differential treatment is appropriate.

However, you may feel on these issues, it should be pretty clear that the way we categorize things goes a long way towards how we feel about them. Propagandists and spin doctors know this well.

If you want to increase your critical reasoning abilities, you need to tune your ears to subtle uses of the Concept of Identity.

The Concept of Identity is not only the most fundamental concept in philosophy; it is the most useful. Over the next week tune your ear to listen for all of the ways people use the word 'same', and tune your mind to catch all of those pieces of knowledge that you encounter that rely, in some way, on the Concept of Identity.

## Why the Concept of Identity Matters in Research

Consider the two concepts represented by the circles below. The concept on the left is a well defined concept because the instances that make up the concept are all essentially the same. The concept on the right is a poorly defined concept because the instances that make up that concept are not essentially the same.
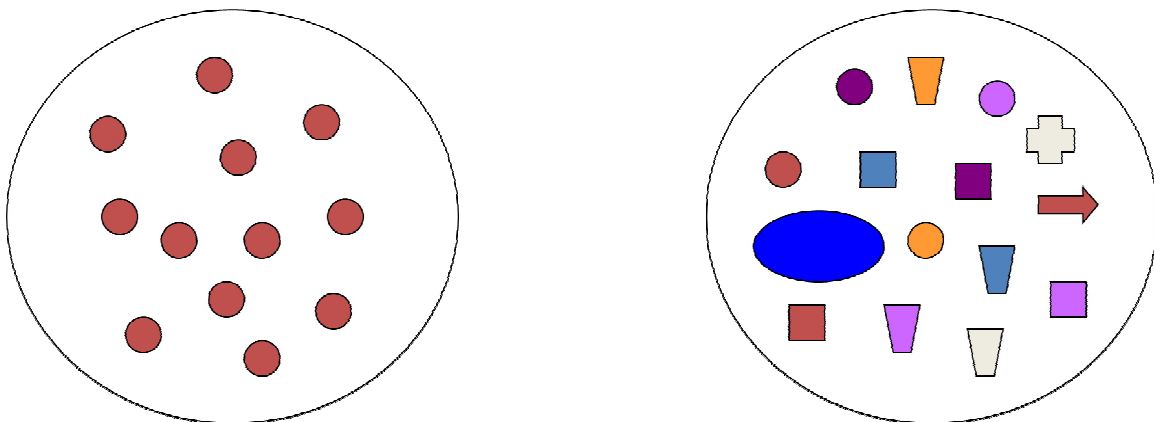


Figure 1: Well Defined vs Poorly Defined Concepts

We like to advance our knowledge by identifying a concept and then making general statements about the instances of that concept. That not only achieves an important degree of intellectual economy but it allows us to infer properties of new instances of that concept. For well defined concepts, such as the one on the left, we can easily make general statements about the instances. For poorly defined concepts, such as the one on the right, it is very difficult to make any general statements. Hence, well defined concepts are at the heart of good research.

Next consider the concepts shown in Figure 2. Here we have two well defined concepts. Since the concepts are well defined we can identify regular relationships between them.
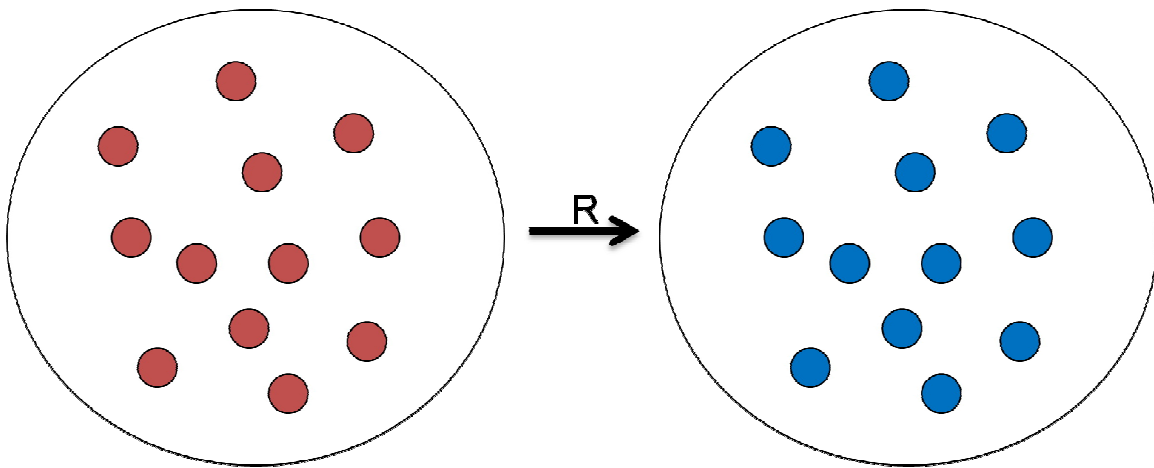


Figure 2: Two Well Defined Concepts

However, the concepts in Figure 3 are poorly defined and making any general statements about how they relate to each other would be very difficult.
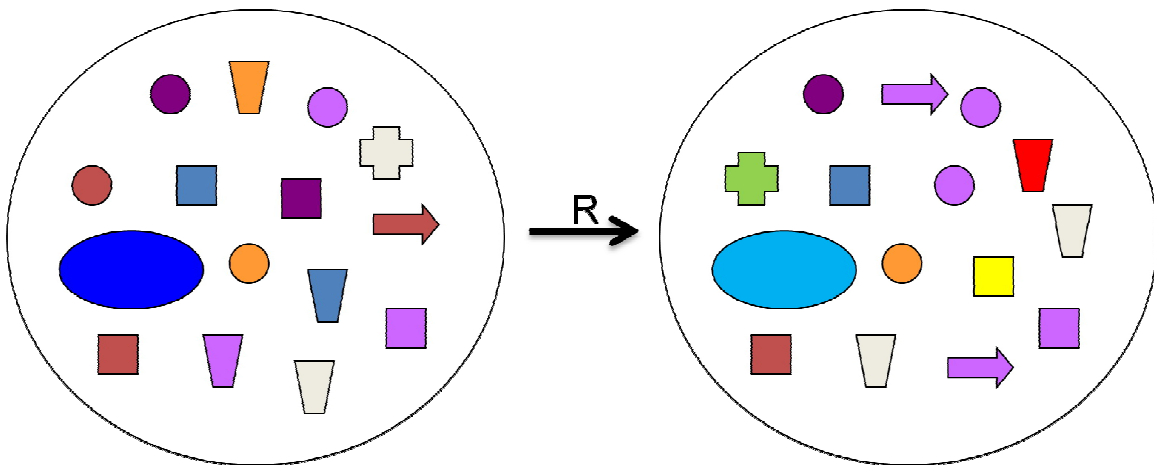


Figure 3: Two Poorly Defined Concepts

**Chapter 3 - The Problem of Universals**

**The Problem of Universals**

The Problem of Universals is one of the central problems in metaphysics and attempts to address questions about how we organize our experiences about the world into meaningful categories for the purposes of intellectual economy. This is a bit of a mouthful and requires some elaboration, especially for those who have never encountered this concept. The elaboration occurs in the next section. Once the problem is clarified, it is useful to survey some of the commentary on this problem from some of the great minds in Western Philosophy. When we look around us we see objects everywhere: tables, chairs, lamps, trees, fences, birds and so on. Imagine, for a second, that you are looking out your window at a tree. You might point at the tree and say, "That is a tree." What you mean more precisely is "That object is a tree." Or even more precisely, "That object is an object of type tree," or "That object is an instance of the class of trees." What we are talking about here is the difference between things and kinds. The object we are looking at is a thing. When we call it a tree we are assigning it to a kind. There are many kinds to which this thing may be assigned. We could call it a home for squirrels, a source of shade, or a source of fire wood instead. Somehow the category tree seems more real than the others, but this is likely to be because it is a basic level category or a category with which we have first hand physical experience. Nonetheless, a thing can be assigned to any number of kinds. Although we have introduced these notions intuitively here, the difference between things and kinds is difficult to explain without using technical language. So let's introduce some mildly technical language for the purpose of clarifying this discussion.

The thing you are looking at through your window in the preceding discussion is an instance, or in metaphysical terminology a particular. The label "tree" is not the name of the object. It is the name of a class to which the object belongs, or once again in metaphysical terminology a universal. Particulars exist in the world and universals are the categories into which we organize them. We do this for the purpose of intellectual economy. We cannot possibly remember all the attributes of every object that we encounter nor could we extend our knowledge from objects we have encountered to objects we haven't encountered without universals. But universals pose a vexing problem and that is – where do universals come from? How do we get from the particulars in the world to the classes into which we organize those particulars? And this, along with some lesser problems constitutes what is referred to metaphysics as the Problem of Universals. Ordinary language often overlooks this problem entirely. When you point to an object and call it a tree, you do not ask yourself how you know it is a tree. Nor do you ask where the quality of treeness came from, nor why it could not be called something else. Mark Twain deals with this problem in a very humorous fashion in the diary of Adam and Eve.

Entry in Adam's diary:

Tuesday: Been examining the great waterfall.  It is the finest thing on the estate, I think. The new creature [Eve] calls it Niagara Falls – why, I am sure I do not know. [She] Says it *looks* like Niagara falls. That is not a reason, it is mere waywardness and imbecility.

Robert Pirsig also addresses this problem at length in his bestseller Lila. So the deep metaphysical nature of this problem does not keep it out of popular culture. Nor does it keep it out of social science research. Yet, people who have never encountered this problem often find it perplexing in the extreme. Consider the following question – Is a tree a tree because it is a member of the set of trees? Or is it a member of the set of trees because it is a tree? In more straightforward terms these questions are an attempt to find out if kind is determined by category membership or if category membership is determined by kind.

One is tempted to just leave this tricky problem up to philosophers and go on with one's life. However, the many practical implications of this metaphysical problem force us to confront it. For example, when a research looks at a domain of inquiry he or she sees particulars instances. These instances are organized into classes called concepts which are then represented in the research model. Concepts are universals. And the problem of getting from specific occurrences of behaviors to the  concepts represented in the research model is no more or less than the Problem of Universals. Let's say that we have a research model involving a university. Let's say further that we have an concept called Student. We can ask – Is a student a student because he or she is a member of the set of students? Or is a student a member of the set of students because he or she is a student? And we are right back to the problem as stated earlier. One would think that people in a university environment would know what a student is. But a few simple questions expose that fallacy very quickly. Is a part time student the same kind of thing as a full time student? Is a student who has not signed up for any classes still a student? Is somebody who sits in class and learns but does not pay tuition still a student? Are alumni auditors considered students? If somebody pays their tuition using loans that they later default on, does that mean they never were a student? How we get from the particulars in the world to the groups into which we organize our knowledge is a foundational problem in information modeling as well as in metaphysics. The next section will explore the opinions of a number of western philosophers as they tried to grapple with this difficult problem.

**A Brief History Of Problem Of Universals**

Plato was the first western philosopher to seriously consider the Problem of Universals. His concern was that a person could recognize an object, such as a tree, for example, even though there is so much variation between individual trees. Some trees are very tall and majestic while others are short and bushy. Some have leaves on their branches while others have needles. And yet, with all this variation, a person

can still recognize an object as a tree. In attempting to answer to this problem, Plato took a cue from geometry. There is also a great deal of variation between mathematical objects like triangles, for example. They differ in size, width of the lines making up the sides and angles. But there is also a template definition that covers all triangles regardless of their differences. They are three sided geometric objects with three side and three angles the sum of which is 180 degrees. So, for trees there must be something similar. Plato believed that there was some essential concept of *treeness* against which one compares individual objects and decides whether or not the individual in question qualifies as a tree. But where did this concept of *treeness* come from ? Here Plato offered a unique, if somewhat bizarre, answer. He postulated the existence of a nonmaterial world which he call the World of Forms. The World of Forms contains the eternal unchanging essence of things from the material realm. So that the Form *tree* that describes the eternal unchanging essence of *treeness* exists in this world and this world can only be perceived by the intellect. Plato used the term *Form* in much the same way that an information modeler would use the term entity class. It is the template or general definition of the object type independent of variations between individual entities.

Plato is seen as a realist. He believed that the World of Forms actually existed independent of minds to perceive the Forms. Further, he believed that the World of Forms was more real than the physical world as perceived by the senses because the physical world was unstable and filled with variations and imperfections. The World of Forms, on the other hand, was a world of timeless perfection. While the existence of this World of Forms that is somehow more real than the world perceived by the senses causes one to raise a skeptical eyebrow, it does answer some difficult questions that are not effectively addressed by later views. For example, how can you have a Form without instances ? And how can you derive a perfect Form from widely varying imperfect instances.

Plato's goal, in his theory of universals, was to define concepts with the same precision and perfection that mathematical objects such as a triangle or a square are defined. This is why he had to postulate the existence of an unchanging World of Forms in which mathematically precise definitions did exist. Aristotle, Plato's most famous student, rejected the World of Forms based on the obvious problems of postulating a world that could not be perceived by the senses. Where Plato was interested in ideals, Aristotle was much more interested in the real world of sense perception. Aristotle's goal, in his theory of universals, was to classify natural objects into the natural kinds to which they belong and to organize those kinds into natural hierarchies.

Aristotle saw things a little differently. He did not believe in the independent existence of pure Forms. The only real entities to him were the particular objects of the world. And yet, Aristotle did not believe that the construction of universals was purely arbitrary. Trees have properties that are fundamentally different than the properties of chairs or rocks and these properties are inherent in the individual objects. They are a part of the physical world and can be known through the senses.

Not only do these properties exist, but they can be articulated and used to organize particulars into kinds. Those kinds can, in turn, be organized into hierarchies of kinds which Aristotle called genus and species. Hence, universals, according to Aristotle, exist as collections of properties, and these properties, in turn, do exist in the real world. Plato and Aristotle were realists, believing that universals have an existence in the world independent of any minds to perceive them. And this view held throughout the middle ages. However, the British empiricists, beginning with John Locke, began to recognize the role of the mind in creating universals and turned the corner from realism to a new view of universals called conceptualism.

According to Locke, a universal is formed through the cognitive process of abstraction. In this process we view particular instances and abstract from those particulars certain properties that they hold in common. Thus, a universal is one collection of common properties held by a set of particulars. At first glance this sounds like Aristotle's view of universals. And, yet, Locke rejected the Aristotelian view that the classes exist in the world. We do not, according to Locke, find objects and their features neatly divided by nature into objectively delimited classes. Instead, limitless similarities and differences are there for us to perceive but how we perceive them, how we select them, how we use that information to form classes, and how we place objects in different classes is up to us to decide. Locke disagreed with Aristotle by saying that we select the features we use to frame a universal rather than simply taking what is there. Yet, he still believed that universals were explicitly defined. That is, the abstraction process, according to Locke, was rational and could be explained objectively. David Hume went a step beyond Locke and said that the construction of universals was not only done in the mind of the observer, but, according to Hume, this abstraction process occurs below the level of rationality.

According to Hume, universals are constructed by noticing similarities and differences between objects, just as Locke had asserted. However, this process is not guided by abstraction objectives as Locke had claimed. Instead, according to Hume, it is a result of organizing our experience at a preconscious level. Any explicit definition of what constitutes a given universal is done after the universal is defined in our minds and incorporated into our language. If the meaning of universals is constructed at a preconscious level, then an obvious question is raised - is it always possible to explicitly define the characteristics of universals that exist both in the minds of people and in common everyday language ? Wittgenstein didn't think so !

Wittgenstein took an extreme position with regard to universals. To him, universals not only exist solely as concepts in the mind, but they exist in the mind as poorly formed concepts. According to Wittgenstein, explicit definition of certain classes is not possible. In fact, many classes that we use are so poorly formed, that the only thing that the particulars in them have in common is that they are all members of the same class. He illustrates the point by comparing class membership with family resemblances. Members of a family may look like each other, yet it may be difficult to define a set of features that they all share. Some have the same nose. Some the

same chin.  Some the same eyes.  But there is no set of features common to them all. Classes that are held together by family resemblances defy any attempts to construct well defined classes categories or universals.


**The Problem Of Universal And Social Science Research**

The philosophical positions we just discussed represent a range of assumptions that a researcher may hold. It is unlikely that these assumptions are explicit. Yet they can be seen in various approaches to modeling. For example, naïve researchers often adopt the Platonic approach.  They study the domain until the concepts emerge from some intuitive process as though they had apprehended the World of Forms with their intellects. Platonic modelers cannot tell you how they derived the concepts although they seem fairly certain, intellectually, that the concepts are correct. They are likely to be naïve realists believing that the concepts exist in the domain and that they have discovered them. However, the existence of the World of Forms was even difficult for Plato to justify and the Platonic information modeler is on similarly shaky ground.

Aristotle's position provides much of the philosophical basis for the more disciplined approaches to modern scientific research.  The researcher observes instances in the real world and then identifies their attributes.  Next, based on the commonality of attributes, these instances are grouped into concepts and the common attributes become the concept attributes.  In physical science research the commonality of attributes can be used to define class hierarchies which follow Aristotle's concept of genus and species.  However, one must remember that Aristotle was classifying physical objects that had been shaped over millennia by the forces of nature and evolution. Yet, the domain of the business researcher is the artificial world of business and commerce where concepts such as Customer, Employee, Productivity and Motivation are merely useful constructs not shaped over millennia by the forces of nature.  A customer is not a customer because of some set of physical characteristics.  A person is a customer because of a relationship that exists between the organization and the person.  Another person may be an employee based on a different relationship to the organization.  A person may take on different roles at different times or have multiple roles at any one time.  Further, the customer need not be a person, the customer may be another organization.  Hence, it is not possible to define these classes based on physical characteristics.  These classes are defined by the changing needs of the organization to organize its information about the world. Thus, although the scientific realism of Aristotle provides a convenience basis for physical science research, it makes assumptions about the domain of investigation that are probably not valid for social science research.

Locke's view of universals provides quite a different perspective for research. Instead of forming classes based on common attributes, the researcher needs to define a set of modeling objectives to guide the abstraction process. From Locke's perspective, there are many ways to model a domain of inquiry depending on what

the modeler is trying to achieve. Most social science research falls into this category. Constructs such as Customer, Employee, Productivity or Motivation are defined in terms of attributes that are important to the problem at hand while vast numbers of attributes are simply ignored as unimportant. This creates problems for the researcher because it suggests that universals such as Student or Customer may exist in the minds of users and in the language, but may not have any explicit definition. Further, any appropriate and explicit definition may lie in the domain in the future but not the present.

Thus, if Hume's view is correct then the process of social science research becomes the process of language refinement. People often employ terms like customer or student without a precise understanding of what they mean. In fact, this is a clear example of Bacon's Idol's of the Marketplace. The researcher must talk with people in the domain and consult relevant related research, then construct useful definitions. Further, these definitions must be agreed upon so that social science research also becomes the process of achieving a social consensus. Finally, if Wittgenstein is correct, then a domain cannot be modeled nor researched without a serious semantic revision to superimpose semantic order upon it.

**Extending The Problem Of Universals To Social Science Research**

Thus far we have discussed the Problem of Universals, some philosophical responses to the problem, and some ways in which these responses can be seen in the practice of social science research. Next we turn to the task of refining our discussion of the Problem of Universals by beginning to providing a foundation for the practice of operationalizing concept definitions for research. From this foundation we will begin making observations about how the practice should be refined. In doing so we define four philosophical positions that apply directly to the construction of research models. These are: class realism, class conceptualism, attribute realism, and attribute conceptualism.

**Concept Realism** - The class realist believes that concepts actually exist in the world for anyone to discover. The class realist attempts to discover the set of concepts that exist in a domain by examining the domain; and the validation criteria for a model created by a concept realist is that it represent the classes as they exist in the real world. There is no possibility that concept formation is influenced at all by the cognition of the observer, because the concepts can be discovered and verified objectively. If concept realism holds, then there can only be one correct research model for any given domain - the one that accurately models the real world. Although this metaphysical position is quite prevalent among social science researchers (especially those who see social science research as an extension of physical science research), there is little philosophical support for it. It is a modern day version of Platonic idealism in which concepts exist in some nonmaterial world waiting to be apprehended by the intellect. Even Plato, who originated the position, had quite a bit of trouble with it.

**Conceptualism** - The conceptualist believes that concepts are constructed in the mind of the observer through some cognitive process of abstraction based on cues derived from the real world. If conceptualism is correct, then concept formation may be influenced by a wide variety of social and cognitive factors that may influence the abstraction process. Further, validation becomes very difficult. Since the model is the result of an abstraction process it is necessary to validate the resulting model using some criteria other than conformance to the real world. Philosophically, this position is more likely to be correct. However, it brings a host of new problems into the practice of social science research. In fact, it strongly emphasizes teleology over mechanism because we not only need to think about purposes in the social world we need to think about purposes with respect to our research.

**Attribute Realism** - The attribute realist believes that attributes or properties of individual instances exist in the world independent of the cognition of the observer. Concepts can then be formed by grouping instances with like attributes. More rigorous approaches to quantitative research such as factor analysis or principle component analysis adopt this position and there is some justification for it under a limited set of circumstances. There are two forms of attribute realism, limited and extended. Limited attribute realism suggests that instances have a limited set of properties and like instances can be grouped according to the commonality of those limited properties. Extended attribute realism suggests that instances have a virtually unlimited set of properties and groupings are formed based on common subsets of properties. If extended attribute realism holds, then an abstraction process occurs when a small set of like attributes are selected for the grouping process. Once again, social and cognitive factors may influence the grouping process. And attribute selection must be guided by research objectives.

**Attribute Conceptualism** - The attribute conceptualist believes that attributes or properties of individual instances of a phenomenon are constructed, once again, through a cognitive process of abstraction guided by cues form the real world. It may be reasonable to assume attribute realism in the case of physical properties of entities. However, attributes of concepts that are functional in nature or define relationships between concepts are almost certainly constructs. If attribute conceptualism holds, then attribute construction may also be influenced by a wide variety of social and cognitive factors that may influence the abstraction process. Once again, attribute construction, like concept construction, would have to be guided by research objectives. Attribute conceptualism can be constructivist or re-constructivist. The constructivist defines attributes based on cues from the environment largely based on the usage of terms in the language of the domain. The re-constructivist has to redefine the set of attributes in order to make sense out of conflicting usages.

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**An Illustrative Example: What Is A Student?**

Sometimes it appears that we are playing word games when we discuss the semantic complexities of concept formation. For example, when we ask - 'What does it mean to be a student?' - practically minded people often think that we are just engaging in so much philosophical double talk. The purpose of this section is to show how this question is crucial to designing a research model that will deliver accurate information. First we will show how it is not at all obvious what we mean by the designation student. And second we will follow with a discussion of the realist versus conceptualist assumptions in terms of this example.

A degree program has 200 students that break down into the following categories: 70 are full time students taking three classes; 20 of the full time students are on full scholarship; 30 are part time students taking two classes; 20 are part time students taking one class; 10 students are on leave of absence taking no classes; 40 students are doing internships taking no classes; 20 are alumni auditors getting continuing education credits; 10 students are sitting in on classes with the permission of the instructor.

There are three courses offered each semester: a two credit course (five sections); a three credit course (three sections); and a four credit course (two sections). The two-credit course has a two-hour lab that is staffed by a teaching assistant or a doctoral student.

Fees are $500 per credit hour. Students on scholarships get a 50% discount. Alumni auditors pay $100 per credit hour.

There are two full time faculty members teaching two sections each and five adjuncts teaching the other sections. There is another full time faculty member who only teaches one class and administers the program.

We have the following potential definitions of student:
1)      A student is a person enrolled in the program
2)      A student is a person attending classes
3)      A student is s person paying tuition
4)      A full time equivalent student is taking three classes and paying full tuition

We have the following potential definitions of class:
1)      A class is a course
2)      A class is a course offering
3)      A class equivalent is twenty students taking three credits

We have the following potential definitions for a faculty member:
1)      A faculty member is a full time member of the faculty
2)      A faculty member is anyone who teaches a class
3)      A faculty full time equivalent (FTE) is three covered classes

Now consider the following questions:

1)      How many students are there with each of the potential definitions?
2)      How many classes are there with each definition?
3)      How many faculty members are there with each definition?
4)      How many faculty-to-student ratios are there? What are they? Which is the most meaningful?
5)      How many class size measures are there? What are they? Which is the most meaningful?
6)      In questions 4 and 5 above how would the question of which answer is the most meaningful vary for 1) the university admissions department; 2) the class scheduling office; or 3) the Dean's office that tracks faculty productivity?

Consider how differently this model would be designed given the following potential statements of purpose:
1)      The purpose of this database is to track program revenues and compare them again program costs.
2)      The purpose of this database is to track program viability in terms of demand for the program and demand for the courses.
3)      The purpose of this database is to schedule class meetings and ensure that the appropriate space will be available in the classroom.

Consider how differently this model would be designed given the following problems:
1)      An increase in the number of part time students has caused course offerings to be under utilized. Admitting 25 full time students produces 75 enrollments and $37,500 in tuition revenue, whereas 25 part time students taking one class produces 25 enrollments and $12,500 in tuition revenue. Admissions targets must be carefully regulated in order to maintain program quality and program profitability.
2)      An important metric of program quality is the faculty to student ratio. As the program expands, it must maintain an adequate ratio in order to maintain accreditation and attractiveness. However, full time faculty are a major long term commitment so increases in full time faculty must be made on strong predictions of program growth.
3)       The university financial aid policy allows an average discount of 20%. This includes scholarships and alumni audits. Further, non-enrolled students are encouraged to sit in because it increases the good will of the program and provides some marketing benefit. Unfortunately, the number of chairs in a classroom restricts class sizes and these seats must be allocated in such a way that tuition targets are achieved along with the quality and goodwill of the program.

The purpose of this example was to show that even though we may think that the definitions of categories such as student, faculty and course are beyond question, they actually do raise a large number of questions. Further, when the categories are in question then any data derived from these categories such as student to faculty ratio or faculty course load also become questionable. Finally, the only way category definitions can be constructed correctly is to know what you are trying to achieve

with the research model and this requires an explicit statement of research objectives.

## Implications For Social Science Research

The different metaphysical positions we have discussed lead to quite different approaches to social science research and different results in the model produced. Class realism is often adopted by naïve researchers and often implicit in books on research methods that do not explicitly address the discovery problem. Unfortunately, class realism is not supportable under any circumstances. If the class realist develops the correct model it is either just luck, or the demands of the research have been defined after the fact as those information needs that the research can support. We often joke that when definitions are inadequate find somebody more important than you and ask them. More important may mean higher rank, more publications, greater stature or makes more money than you. But, unless this person of greater stature knows a lot more about the Problem of Universals than you do, that is not likely to get you any further ahead.

Class conceptualism is a far better foundation for the research. This, however, suggests some fairly radical changes for the practice of social science research. Currently, we focus on conceptual models that show the relationship between concepts. If class conceptualism holds, which appears to be the case, then we should be focusing on the question of how concepts are constructed to meet our research needs rather than potential relationships between existing but poor formed concepts. Further, we can no longer validate a research model by comparing it to the real world (since that assumes class realism). We have to define objectives for the model and evaluate constructs according to how well they meet those objectives.

Attribute realism is, at least, slightly suspect. Instances of concepts in the real world, such as plants, animals and rocks, do have physical characteristics. However, the purpose of a social science research model and the purpose of a scientific taxonomy are likely to be quite different. Scientific taxonomies do not consider functional or artificial attributes in their classification. Yet social science research models do. Assuming that concepts have a limited (and small) number of physical attributes that can be used to group them into classes is hard to justify in practice. Instances of a phenomenon have lots of attributes (physical and artificial), some that they share in common with other instances some that they do not. Attribute realism does not allow for functional or artificial attributes. Limited attribute realism does not allow for the fact that instances may not have uniform properties. Hence, attribute realism does not provide an adequate foundation for practice.

Attribute conceptualism seems to provide the richest foundation because it acknowledges the existence of nonphysical attributes. It also allows for the fact that we pick and choose attributes based upon (possibly implicit) objectives in the modeling process. It also allows for the fact that we may invent some of the

attributes. This leaves the question of whether or not the attributes can be constructed from the linguistic usage.

If the model must represent usage and the usage is somewhat consistent, then it may be possible to construct a research model of the phenomenon in question. If the model must represent usage but usage is not consistent then it will not be possible to construct a coherent model. Finally, if the model does not have to reflect usage, it can be constructed to meet modeling objectives. If the objectives are consistent, then the model can be constructed, otherwise not. Yet the resulting model may not be consistent with the average person's concept of what the various constructs mean.

## Conclusion

The Problem of Universals provides both a metaphysical foundation for social science research and substantial insight into the nature of the process. Research methods should focus less on analytical techniques and more on the problem of what is to be represented. Since class and attribute conceptualism provides a much firmer philosophical foundation, then the work of researchers in social science is to determine how to define modeling objectives and how to compare competing models with respect to those objectives. A secondary area of research interest should be in understanding how cognitive factors and individual differences between information modelers affect the models they produce.

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**Philosophical Foundations of Business Research**
**Chapter 4 - Concept Analysis**

*When we name things correctly, we comprehend them correctly, without adding information or judgments that aren't there.* – Epictetus

Consider the follow paragraph from a critical book on science fiction literature.

> "The term 'science fiction' resists easy definition. This is a strange thing, because most people have a sense of what science fiction is. Any bookstore will have a section devoted to SF: shelves of mostly brightly coloured paperback volumes, illustrated on their covers with photorealist paintings of intricate spaceships perhaps, or of men and women in futuristic cities or bizarre alien landscapes. Most of these novels are narratives that elaborate some imaginative or fantastic premise, perhaps involving a postulated future society, encounters with creatures from another world, travel between planets or in time. In other words, science fiction, as a genre or division of literature distinguishes its fictional worlds to some degree or another from the world in which we actually live: a fiction of the imagination rather than observed reality, a fantastic literature.
>
> But when it comes down to specifying in precisely what ways SF is distinctive, and in what ways it is different from other imaginative and fantastic literatures, there is disagreement. All of the many definitions offered by critics have been contradicted or modified by other critics, and it is always possible to point to texts consensually called SF that fall outside the usual definitions. It is perhaps, for this reason that some critics try to content themselves with definitions of the mode that are mere tautologies, as if 'we' all know what it is and elaboration is superfluous." [Roberts, pg. 1-2]

The quote aptly represents the plight of the researcher who is attempting to investigate a concept, in this case science fiction literature, which is as widely referred to as it is poorly understood. This is also another excellent example of Bacon's Idol's of the Marketplace. We have a concept that is very familiar in common usage. There are few literate people in the world who do not believe they know what science fiction is. And yet few could define it with any precision for the purposes of research. The problem is that we need a definition that will include all instances of science fiction and no instances of things that are not science fiction. We need inclusiveness and internal consistency because we would like to make statements about all things that are science fiction and how they related to other things.

To sharpen this point further, consider the following claims about the definition of science fiction:

1) Science fiction must be based in know science and speculate about how we might deal with new worlds brought about by scientific advances.
2) Science fiction is anything in the Science Fiction section of a book store.
3) Science fiction is anything written by a recognized science fiction author.
4) Michael Crichton's work is not included in science fiction because it is considered general fiction in bookstores.
5) Piers Anthony's Adept series is not science fiction because it fails to explain how science and magic co-exist.
6) Cyberpunk is not science fiction because it fails to explain the underlying scientific mechanisms.

You could easily add more of your own and if you asked around you would find plenty more.

Now, assume that researchers are attempting to determine the value of science fiction to determine the extent that it should be included in school curriculums and represented at public libraries. Consider the following possible research questions:

1) Does reading science fiction increase literacy in high school students?
2) Does science fiction stimulate student's imagination?
3) Does science fiction encourage students to pursue careers in science?
4) Do students who read science fiction perform better in science classes?
5) Do students who read science fiction perform better in literature classes?

Again you could probably come up with more examples on your own. The point here is that it would be very difficult to answer any of these questions without a clear definition of what science fiction really is. And it would be very difficult to clearly define science fiction given the range of questions above.

However, for purposes of our subsequent discussion we are going to take a concept that is much simpler than science fiction. We are going to look at the concept of software piracy. Suppose a person vehemently proclaims that he or she is opposed to software piracy. What do you do? You can simply ignore them and try to justify it to yourself by saying that you just don't have time to deal with this issue. You can accept their claim on face value and adopt the position deciding that you are opposed to software piracy also. You may decide that you are ambivalent about this issue but don't wish to explore your ambivalences. Or you might decide to take the bull by the horns, as they say, and explore the issue more fully. Realistically, if you are to have any kind of a legitimate opinion, you must to the latter. You must dig into the issue and decide what you really think about it. But how do you do this?

The first step is to realize that the issue as presented already contains built in biases. The phrase 'software piracy' is a bad thing on the face of it. The word 'piracy' is not a neutral

word. It refers to pirates and people who take things that don't belong to them. So nobody could be in favor of software piracy and the question becomes - what do you think of the activity that software piracy refers to. The difficulty, of course, is that software piracy refers to a collection of activities some of which you might support and some of which you might be against. So it may be prudent to turn back to the person who made the claim for some clarification since piracy is such a vague and value laden word.

When asked for clarification, the person is likely to respond with something like "I am opposed to software piracy because it is stealing!" There may be any number of other valid responses but we need one to work with so we will take this one. We have made some progress because we now have the allegation that the activities that comprise software piracy fit neatly within the set of activities that we call stealing. If this is really the case, then software piracy is a bad thing because stealing is a bad thing.

On the other hand, a person who copies a software program might justify their action by saying that what they did was not really stealing. They may justify or even rationalize their activity by saying that they were just borrowing the software for evaluation, stretching the license, or simply making a backup copy. What they are saying is that the concept of stealing defines certain behaviors that do not include the action they just took. In order to figure out who is right we need to refine our understanding of the concept of stealing and concept analysis is the technique we use to do this.

Think of a concept as a sphere. Things that are clear instances of that concept are inside the sphere and the closer to the center they are the closer they are to the essence of the concept. Things that are clearly outside of the sphere are clearly not instances of the concept. The boundaries of the sphere are fuzzy. While many things are clearly in or out; many other things are on the boundary - some more in than others and some more out than others. Finally, we can see the concept sphere reflected on other surfaces where the concept is being applied to other meanings. Looking at these other meanings can be misleading because the essence of the concept has been transformed to include other things. Our goal in concept analysis is to define the concept sphere. We want to determine what is clearly on the inside and what is clearly on the outside. We want to know what is on the boundaries and in what way the essence of the concept has been transformed to include other meanings that are not part of the essence of the concept. We can begin our concept analysis by following a few simple steps.

Look for Exemplars: Look for clear examples that are as close to the essence of the concept as possible. These examples should be undisputed by any reasonable person. If it is not possible to find exemplars, then, possibly, the concept is too poorly defined to be useful. In the case of stealing we can imagine a burglar breaking into an appliance store in the middle of the night and leaving with a television set. It is hard to imagine any circumstances in which this would not be stealing. Although there should be agreement on exemplars, in a group setting a variety of exemplars may reflect a variety of different understandings of the concept. If people begin with different understandings of a concept, then any conclusions based on those different understanding might be quite different also.

Look for Counterexamples: Look for clear examples of things that are similar to the concept but clearly not contained within the concept. These counterexamples should also be undisputed by any reasonable person. In the case of stealing, find examples of actions that are like stealing but are clearly not stealing. For example, a customer comes to the store during working hours and purchases a television set. It is hard to imagine any circumstances in which this would be considered stealing (even if the customer got a really good deal and declared that is was a steal). As with exemplars, there should be agreement. However, in a group discussion a wide variety of irresolvable counterexamples may indicate widely varying understandings of the concept.

Look for Borderline Cases: Look for examples that are not clear. Borderline cases help to focus on key attributes and make up the fuzzy area between the exemplars and the counterexamples. For example, what if the thief in the exemplar was also the owner of the store? Can a person steal from his or her self? What if the person in the counterexample had changed the price tag? What if a person purchases an appliance and pays for it. However, upon leaving the store, they notice they got the wrong color. So they put back the one they paid for and took one they didn't pay for. Is it stealing? Borderline cases help us clarify our understanding of the concept.

Identify Attributes: List the essential characteristics of instances that are included in the concept in question. These attributes should apply to all exemplars and no counterexamples. The borderline cases should provide some refinement on these attributes. With the identification of attributes we begin to get some insight into the essence of the concept under consideration.

Consult the Dictionary: When asked to provide a definition of a concept, some people would prefer to defer to the dictionary. This is certainly much easier than trying to figure it out for your self. However, the dictionary provides definitions that reflect common usage that is usually not sufficiently clear for concept analysis. Nonetheless, consulting the dictionary can be a useful data point in clarifying a concept. The dictionary will usually list several definitions that reflect the variety of ways in which a word it used. These definitions can be used to further discussion of the concept. In addition, the dictionary will usually provide an etymological derivation of the word, which is frequently useful to see what the heart of the concept was at one time or will provide insight into the essence of the concept. Stealing, for example, is defined as taking another's property without permission. Still, it is important to not take dictionary definitions too seriously. If a person buys a car but fails to make the payments the car may be repossessed. The repossessor almost certainly is taking the car without permission, but it is clearly not a case of stealing.

Consult Legal Definitions: Sometimes there are legal definitions that may be useful. However, like dictionary definitions, legal definitions cannot be taken as the final word. Sometimes legal definitions are constructed to fit within the legal system and do not agree with the intuition of the average person. Nonetheless, they are the usually the result of serious deliberation and consideration and hence may provide insight into the essence of the concept.

Continuum Construction: Come up with a list of all instances mentioned so far and and any more that you can think of that belong, to some degree, to the concept. Rank all examples in a continuum from clear cases to counterexamples. Try to determine, especially for the borderline cases, if there is a single attribute or a collection of attributes upon which they differ.

It should be mentioned that concept analysis is not a mechanical process and the preceding steps are merely a guide. Practice is important here. The more concepts one attempts to analyze the better one gets at it. While the steps just presented help to develop an understanding of the essential concept, the following suggestions will help to test and refine that understanding.

Construct an Essential Definition: Attempt to come up with as simple a definition as possible that covers the essential attributes of the concept. This may vary greatly from the dictionary definition that reflects common usage or the legal definition, which is used to establish facts in court. The essential definition is intended to determine whether or not specific instances should be included within the concept and thus serves a conceptual membership role rather than the role filled by other definitions.

Inclusion of Particulars: Search for specific examples and determine whether or not they are examples of the concept. This tests the strength and merit of the essential definition.

Socratic Shuffle: Socrates would often keep his interlocutors off balance in the following way. He would ask them to explain a give concept. If they provided instances of the concept he would ask for a general principle that covered all instances. If they provide a general description of a concept he would provide an instance that was not covered in the general description. In some sense this is a little unfair since there probably is no general description of a concept that includes all instances. Nonetheless, it is a useful technique for exploring subtleties of a concept.

Invent Cases: Sometimes it is necessary to construct cases to test essential attributes.  These contrived cases may be unlikely to occur, or they may even be impossible, but they help clarify key attributes of the concept in question. For example, what if the shop owner and the thief are the same person?  He came to the store in the middle of the night because he needed a present and forgot his key. But, he did not record the fact that he removed a television set. Is he stealing?

Embed Within a Social Context:  The meaning of a concept is often defined by its social context. For example, if the owner of the store was your favorite uncle you might be less inclined to call the action stealing.  If the owner was you next-door neighbor who repeatedly dumped his lawn clippings in your back yard, you might be a little less lenient. We often define concepts based on who or what we like or dislike rather than based on search for precise and useful definitions.

Explore Metaphorical Uses: Many concepts have essential meanings as well as metaphorical meanings. The metaphorical meanings must be examined in two ways. First, the

metaphorical meaning is an instance of the concept applied to elucidate another situation and as such may contribute to a deeper understanding of the concept. Second, since the metaphorical meanings do apply to a different situation they should be identified and excluded from the original concept. For example, if a person says – "Officer arrest that woman. She stole my heart!" we are using a metaphorical meaning of stole which does not belong in the original concept.

Concept analysis does two things. First, it helps individuals clarify their thinking. And second, when used in a group discussion, it reveals the different understandings that individuals may have and helps develop a consensus view of the meaning of a concept. However, in order to be productive in getting to the heart of a concept, a group discussion must have several important features.

Members Must Take Turns: It is important to get everybody's perspective on a concept under scrutiny. If one or two people dominate the discussion then the activity become biased by their opinions. Concepts are usually quite rich and it is important to get as many perspectives as possible in order to recover the richness of a concept.

Members Must Be Respectful of Other's Opinions: In order for members to contribute freely to a discussion, other members must be respectful of their opinions, regardless of how different they may seem initially. In a group setting, concept analysis is a group search for understanding and that understanding cannot be achieved if some members of the group are reluctant to offer opinions.

Members Must Be Skeptical and Critical: While it is important to be respectful of the opinions of others, it is also important not to accept the opinions of others at face value. Members of the group must be convinced of the validity of the contributions of others, otherwise the concept under investigation cannot be clarified.

Member Must Share a Common Goal of Achieving an Understanding of the Concept Under Investigation: The purpose of a group discussion in concept analysis is to achieve a greater understanding of the concept in question. Thus, group members should be more committed to the progress of the analysis than they are to their individual opinions. Effort to derail the ultimate goal of the discussion should be avoided.

In the Platonic dialogs, Socrates was the de facto discussion leader. In this role his goal was to elucidate philosophical principles though the process of a question and answer discussion. For the average group leader, leading a question and answer discussion can be difficult especially when discussion participants may be reluctant to contribute for fear of saying something wrong or stupid. Follow are some standard types of questions to keep the discussion going in a productive direction.

The first type of question is a process facilitation question. These questions are used to make the group discussion process productive. The discussion leader may ask questions such as "Is this topic even worth discussing?", or "Mr. Smith, what do you think of Mr. Jones' claim ?" Process facilitation questions are important for two reasons. First, they help

to get group members to buy into the discussion format. And second, they keep the discussion going in a productive direction.

The second type of question is a concept refinement question. These questions were discussed earlier and serve to help the group in achieving a greater understanding of the topic under consideration. Clearly, this type of question assumes that the group members have accepted the group discussion format and hence rely on the success of the first type of questions.

The third type of question attempts to get at underlying justifications or inconsistencies in a group member's position. In this category there are three types of questions: rational, emotive, and disposition to act. Rational questions are of the form: "What do you think about X ?" and calls the person's reasoning processes into play. Emotive questions are of the form "How do you feel about X ?". Emotive questions call for an affective response and may not agree with rational claims. Questions that inquire about a disposition to act are of the form: "What would you do in case X ?" and seek to determine what the person would do if called to act in a situation. Asking questions of these forms identifies inconsistencies in the participant's moral concepts and sets the stage for further inquiry into the nature of the concept.

When you make a claim such as "I am opposed to software piracy," it is important that you know what you are saying in order to for your claim to have any merit. In order to know what you are saying it is important to understand the essence of the concept involved in the claim. This becomes even more important if the claim is a moral claim or a claim that demands action of some kind. Concept analysis, as presented in the this chapter, is a useful technique for getting to the essence a concept and thus helping us to clarify the content of our claims. The remaining chapters in this book will apply techniques of concept analysis to philosophical issues in information systems with the goal of shedding light and providing greater insight into some of these complex issues.

Keeping an Eye on the Goal

Recall the diagrams of well defined concepts from the chapter on the Concept of Identity. We are trying to define concepts in such a way that all instances are 'essentially' the *same* thing.
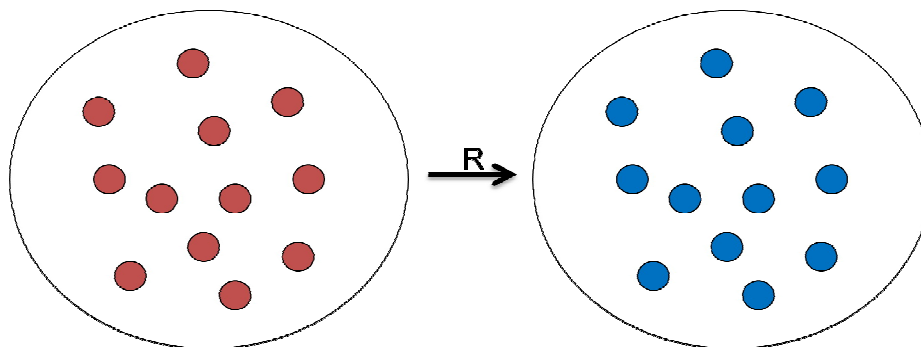


Two Well Defined Concepts

Roberts, A. (2006) Science Fiction. (2e). Routledge.

**Philosophical Foundations of Business Research**
**Chapter 5 - What Is Research?**

The term *research* is a good example of a concept that needs some serious analysis. We use the term research in casual conversation all the time. Consider the following uses of the word research.

"I'm going to buy a new car so I have to do some research."

"If I had done more research I never would have bought that stock."

"Before you go out with somebody you met on a dating site, it wouldn't hurt to do a little research."

"My cousin is in medical research. He feeds the rats at an NIH lab."

"I did some research and saved a lot of money on my car insurance."

"I'm going to the library to do some research on the last ice age."

In casual conversation, these are all perfectly legitimate uses of the word research. However, if a doctoral student were to attempt to do any of these things for a dissertation, he or she would be laughed at. Why is there such a disconnected between common usage and the precise usage of specialists? Francis Bacon observed this disconnect back in the 17th century in his landmark book *The New Organon*. He states,

> "There are illusions which seem to arise by agreement and from men's association with each other which we call idols of the marketplace; we take the name from human exchange and community. Men associate through talk; the words are chosen to suit the understanding of the common people. And this poor and unskillful code of words incredibly obstructs the understanding." [pg 42]

Idol of the Marketplace are one of four idols that prevents scientific progress, according to Bacon. We will see the others later, but for now we will leave it off with the observation that the way words are used in casual conversation is simply inadequate for the purposes of scientific research. This is a problem for scientific researchers in general because when they hone their definitions to the level of precision necessary to make progress in scientific understanding, they encounter two problems. First, they construct a jargon which creates a barrier to entry. And, second, they use terms in ways that are often foreign or counterintuitive to the average person. This is an even bigger problem for people doing research in business. Most people are willing to accept that they may not understand the precise definitions in string theory or quantum mechanics. But in business we talk about terms like productivity, motivation, quality and other concepts that most people think they intuitively understand. In most cases, however, the terms as used by the

average person are far too fuzzy for scientific inquiry and the precision required for scientific inquiry defies intuitive understanding.

The word *research* is a good example of this phenomenon. People routinely use the word research according to the common understanding which is to learn more about a thing. But, a few simple examples show the weakness of this definition. When you are watching a commercial on television, you may well be learning more about a specific product. However, few people would consider watching commercials on television as research. It is instructive to note that as you read this last sentence, you may well have thought to yourself "I can think of instances where watching commercials could be research." That, of course, is true but totally irrelevant to the point. However, it shows a tendency towards inclusiveness which is discussed below. In a second example, let's say that your neighbor's husband ran off with his secretary. You go next door to comfort your friend and find out a little more about the situation. Is this research? Hardly. It is caring for a friend at best and just plain gossip at worst. So our conventional understanding of research as finding out more about a thing doesn't work very well. Why is this? Well, let us consider and compare the purpose for which we use words in a social setting versus the way we use words in a scientific setting.

In social situations we often use the inclusion metaphor "same versus different" where same is good and different is bad. We like people who are the same as us, think the same as us, act the same as us, and have the same values as us. Similarly, we dislike people who are different, think differently , act differently or have different values. A common rhetorical technique is to point out to your opponent "wait, I think we are saying the same thing." It puts you on the same side of an issue from some perspective and same is good. So, we have a tendency, in social situations, to emphasize sameness over differences; inclusion over exclusion; good versus bad. And while this may be good for social harmony, its is bad for the advance of knowledge where we emphasize differences and attempt to explain those differences. Hence, the way we naturally think about things in normal social situations is at odds with the way we should think about things in a research setting. In research, we only want to consider things to be the same if they have the same essence and by virtue of having the same essence are likely to have the same properties and relationships to other concepts. We must dismiss social uses of the word *research* and focus on uses of the word in scientific settings. So we will draw our exemplars from examples of scientific research. It should also be pointed out that concept analysis is not a checklist methodology. The guidelines provided in the previous chapter are just that, guidelines. They should be used to help provide insight into the essence of a concept and not used when they do not do that. So, first, let us consider some exemplars.

**Exemplars**

Exemplars are examples of activities that most people would consider as clear examples of the concept under examination. Later, some of the exemplars may fall out as the essence of the concept is clarified. And, yet, others may be added. But, for now, let's consider some quintessential examples of scientific research. Perhaps, the gold standard

in scientific research is research in physics. Research in physics has yielded a wealth of information about the laws of nature many of which have been amenable to mathematical description. Today, most research in physics is way beyond the grasp of the average person so we can look to a subfield of physics, astronomy, to find some good exemplars. Certainly a person sitting in an astronomical observatory gathering data about celestial bodies is doing research. People developing mathematical models to describe those celestial activities are also doing research. Let's consider some other kinds of research that do not look like physics. We are looking for examples of things that are clear example of research that nobody would challenge. Consider the following possibilities:

1) Gathering data on distant galaxies through observatory telescopes.

2) Doing efficacy trials for a new flu vaccine.

3) Looking through he national archives for documents that will provide some insight into the process of writing the U.S. Constitution.

4) Gathering viewer behavior such as Nielson or Arbitron to set advertising rates.

5) Excavating an old settlement cite to find evidence of early Americans.

Most people would consider the first example of gathering astronomical data as legitimate research. It is quintessential empirical research with careful and often tedious data collection. There are theories of celestial movement that the data will support or not. And there is the possibility for new discoveries since new object may be spotted. Or unusual behavior of known objects may be discovered. And yet this kind of research has a rather glaring weakness. In most research we feel the need to manipulate variables to determine the influence of that manipulation. And in astronomy it is very difficult to conduct experiments.

So, speaking of conducting experiments, consider the second example of test a new flu vaccine. There we have a manipulation, the new vaccine, and we can determine the outcomes of giving that vaccine to people. But, unlike the first example, we are not learning something about the natural world. The flu vaccine is a construct, an artificial, man made substance. We are testing something we made and what we learn is not knowledge about the natural world but knowledge about the artificial world. Nonetheless, testing a new flu vaccine seems importance and most would consider it research.

Next consider the document searches in the National Archives. Unlike research in physics that uncovers patterns in the natural world or pharmaceutical research that discovers properties of newly created compounds, historical research discovers truths about the past. In doing so it must interrogate reliable sources regarding the past and the National Archives seems like it should be a fairly reliable source. Further, this data should be applied to a nontrivial claim of some kind and assertions about the writing of the U.S. Constitution seem sufficiently nontrivial. So even though we are discovering

knowledge about our past rather than the natural world, this seems like a pretty solid example of research.

The next example is a little more difficult to justify. Nielson and Arbitron do traditional market research. Most people who are not in research would consider this to be as quintessential as any research could be. This is an example of a larger segment of research that include public opinion polls and surveys. Many researchers, however, would not consider this as research because it is data collection independent of a theory. Nonetheless, we will include it for now and address the controversy later.

The final example seems like a fairly solid example of research. But there are underlying assumptions about it that need to be brought to the foreground. For example we would assume that the people doing the excavating are trained researchers and not just a bunch of yahoos with shovels. If the excavation is funded, through some scientific institution, so much the better. But there are troubling aspects of this exemplar. There are claims regarding early Americans but not theories. And the data collection is much less objective. The researchers look for things and keep what they deem as interesting. In many ways this is much more haphazard than the marketing research data collection and yet it is considered to be a better example of research. So, is the criteria for research that the research community says it is research? Before we tackle this troubling question let's look at some counter examples.

## Counter Examples

Counter examples are instances of things that have similarity to the concept under investigation but are clearly not instances of it. Counter examples are useful because the attributes they lack will help us define the attributes of the instances that belong. So, what are examples of activities that are similar to research but not really instances of it? For example, if I say I did some research before I bought my car, is that really research? If I did some research to find out which car had the best maintenance record and best owner satisfaction rating, was that really research? How about the work I did preparing this argument. If I did some research to find a definition of research, was that research?

Werner von Braun said "Research is what I am doing when I don't know what I am doing." Is that a fair characterization of research. So every time somebody is stumbling around not knowing what they are doing should we call it research? How about if that person is a trained researcher exploring a new idea? When I was on my first sabbatical, I decided to find out what makes the best afternoon nap. I tried different chairs. I tried reading for a few minutes before the nap. I tried laying on the deck versus staying inside. I tried all kinds of variations to find out what makes the best nap. I am a trained researcher. And I was exploring a new idea. Does that make it research? It does not! I may be a trained researcher in information systems but I know nothing about the theory of naps. Nor do I know anything about the accepted methodologies for obtaining new knowledge about nap effectiveness. So my nap research, while amusing, it not really research.

Should anything published in a peer reviewed journal automatically be considered as research? Valid research is sanctioned by a research community. That community decides which activities constitute valid research. Peer reviewed journals contain reports of research activities that have been reviewed by the community. So it seems that anything published in a peer reviewed journal should be considered valid research. Unfortunately, it is not that easy. Research communities do not produce steady streams of research of consistent quality. There are lulls when little of value is being produced and yet the journal cannot say "this quarter there isn't much of interests so we are not publishing a volume." The journal must go on regardless of whether or not there is quality research. Further, some research only becomes research over time as the community recognizes the value of new ideas. Many, if not most new ideas don't go anywhere. But if you shut off all new ideas you loose the good ones too. Unfortunately, the pendulum sometimes swings a little too far in the other direction and peer reviewed journals publish a lot of junk There are trendy ideas. There are intellectual vacuums. So the fact that a study was published in a peer reviewed journal does not make is valid research. And, in fact, peer reviewed journals are filled with counterexamples.

One last question regarding counter examples - Is scientific research redundant? Can there be research that is not scientific?

**Gray Areas**

It is instructive to consider gray areas also. These are instances of research that may or may not fully fit into our general understanding of the word. For example, there is a project underway call SETI which stands for the Search for Extraterrestrial Intelligence. The SETI people listen to the background noise of the cosmos and attempt to discover anomalies that may indicate intelligent life. Is this research? Arguments in favor of it being research are that it is funded and it gathers data much like astronomers do. One could argue that there is a theory behind it. That is the are looking for signs of intelligence based up the probabilistic unlikelihood of order patterns of radio signals. Arguments against it being research are that there is no basis for believing that there are intelligent extraterrestrials and there is further no basis for believing that intelligent extraterrestrials would behave in ways that we would recognize as intelligent. If, however, they do discover something then its status as research will be retroactively instated. But how do we know that plants are not intelligent and trying to communicate with us. And if they are we probably should be listening to what they have to say rather than beings hundreds of thousands of light years away. And yet the idea of discovering intelligent extraterrestrials is much more compelling that discovering plant communications. This is a case where its status of research may be granted retroactively. If it proves fruitful then we will say that it was research. If it comes up empty we may say that it was a waste of time.

**Definitions**

Having looked at instances of what may or may not be research, let's turn next to some definitions. *Webster New World Dictionary,* defines research as "Careful, systematic, patient study and investigation in some field of knowledge, undertaken to establish fact or principles." This definition raises some interesting questions. For example, since research is supposed to be careful, is sloppy research an oxymoron? Or, since research is supposed to be systematic, does this mean that case studies are not research? Or, since research is supposed to be patient, if you are in a hurry to finish your dissertation does that mean it is not research?

Typing "What is research" into Ask Jeeves (http://www.ask.com/) yielded the following answer:

"Research is defined to include systematic and rigorous investigation directed to the discovery of hitherto unknown facts; the construction of explanatory theory; and, the construction of original works of significant artistic merit; scholarship is defined as an activity directed to the construction of an analysis or interpretation of existing human products of human, scientific, literary and artistic activity aimed at increasing the accuracy and depth of human understanding. Both should result in tangible output."

University of Wollongong
http://www.uow.edu.au/admin/personnel/conditions/research_defn.html

**Attributes**

We can begin to develop a list of attributes that define research. It seems that the activity of research must be careful, systematic, rigorous and patient. That is to say, that the way you approach research matters. Given the four adjectives about research, we can see two important aspects of the pursuit of research one methodological and dispositional. Methodologically the pursuit of research must be rigorous and systematic. Hence, Von Braun's claim that research is what he is doing when he doesn't know what he is doing is a clever sound byte but not useful in understanding research. He does, in fact, know what he is doing. He just doesn't know as much as he would like so he is using a systematic method to sort out what is true from what is not true. Francis Bacon said that method is more important than genius in the pursuit of scientific knowledge. Method, according to Bacon, is the path that gets you there while genius is the speed. If you are on the wrong path speed just gets you to the wrong place faster.

The dispositional attributes are carefulness and patience. These attributes probably hide the key points more than revealing them, but the essence of research is the pursuit of knowledge. Somebody who is pursuing their research strictly for money, fame or recognition of finding it first is a lesser researcher. This does not mean that researchers cannot be motivated by personal gains or competition with colleagues. It simply means that the pursuit of knowledge comes first and personal ambitions must come second.

Imagine the following horrible but revealing scenario. A caretaker in a nursing home feeds Drano to a terminally ill cancer patient to put them out of their misery. But, it turns out instead that the person makes a full recovery. We find out later that Drano cures cancer and this draconian effort on the part of the caretaker has led to a major scientific break through. Was the caretaker doing research? Of course not! It is silly even to ask the question. There was no systematic methodology and the caretaker's intent was not to advance knowledge. So beyond our intuitive repulsion at calling this research it does not meet the two criteria that we have established so far. Even though the activity resulted in a major contribution to knowledge, the results are not enough. It is the method and the purpose that matter more than the result.

While the method is important, we also cannot overlook the fact that the research is intended to produce knowledge. Generally, this means new knowledge although sometimes the research is intended to confirm existing knowledge that has been called into question. Unfortunately, the fact that research is intended to produce knowledge doesn't help us a great deal right now because that forces us to ask the question "what is knowledge?" And that question will not be addressed until the chapter on Epistemology. However, it does lead into the final point. That final point is that somebody has to determine what constitutes legitimate method and what constitutes knowledge. And that requires a social environment within which the research occurs. It is important to note that research must occur within a community that defines what constitute research within that community. So a person living on a desert island who had never been trained in how to conduct research within a discipline could not conduct research.

Can any community define research standards, you might ask. What about the people who believe in UFOs? Don't they constitute a community? Don't they have standards for research? Don't they have criteria for what constitutes knowledge? And the answer to all of these is yes. However, the UFO community exists within a larger scientific community that does not recognize their methods or knowledge. It may turn out at some point in the future that UFOs are real and the work of this community will be accepted into the larger scientific community. But for now it is not recognized as research.

This bring us to the final point regarding research. Is it possible that something could be considered valid research at one point in time and reject later. Or is it possible that research that was not recognized at one point becomes recognized later. And the answer to both of these questions is yes. There is a temporal component to research and that is that it must be recognized over time. So the community that legitimates research is also temporal.

**Kinds of Research**

To further emphasize the social nature of research consider the widely varying criteria for research in various fields. Astronomy is a branch of physics and few people would challenge the status of Astronomy as a valid field of research. And yet is it not possible to conduct experiments in Astronomy. So the manipulation of variables which is important in numerous other disciplines does come into play in Astronomy. In fact, some

disciplines do not use data at all. Research in mathematics produces new theoretical knowledge regarding theoretical structures. There is essentially no empirical component to mathematical research at all. Natural science research examines the natural world and attempts to learns the mechanisms by which things occur and focuses on causes. Social science research examines concepts that do not exist in the natural world, while pharmaceutical research attempt to discover compounds that produce desire effects. If we broaden our scope to include literary and legal research we begin examining documents written by humans and are, in effect, studying products of the human mind often with the intention of influencing future products. Are all these legitimate? Would they constitute research in a different field?

To muddy the waters even further, one might observe that even specific disciplines often allow research models from other disciplines to be used. And, over time, methods change. An approach that was accepted at one point may be out of vogue at another. A technique that was questionable at one point might become mainstream later.

So how does one know how to pursue research in a given area? For the moment I will leave that for the reader to ponder.

However, taking a step back, I would point out that we have been analyzing the concept of research. Any time you ask a question of the form "What is X?" you are embarking on concept analysis. This example also shows us the importance of well defined concepts. Consider the following questions:

1) Is research productive?
2) Should we invest in research?
3) Is research reliable?

These are important questions to ask about research and cannot be adequately answered if we do not have a clear idea of what we are talking about when we use the term 'research'.

As a practical matter, doctoral students need to do research in their dissertations. Faculty members need to publish research to get tenure. So, knowing the answer to the question "What is research?" has great practical value at both a personal and social level.