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# Theory Dependence, Context Dependence, Tacit Knowledge, and Informal Logic

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### *1.0 Introduction*

The variety of texts and methods espoused in introductory courses concerned with argument is striking. Clearly part of the diversity is simply a result of the variety of explicitly acknowledged goals--is it a logic course? a practical logic course? a critical thinking course? a critical reasoning course? an argumentation course? a theory of entailment course? However, even for those who share a reasonably common purpose there still appear to be a variety of approaches.

For anyone familiar with the philosophy of science literature of the last forty years the idea of a variety of competing positions can't help but evoke thoughts of Kuhn's *Structure of Scientific Revolutions* and make one wonder whether the type of view espoused by Kuhn might not have something useful to say about informal logic. Some fairly obvious formulaic questions one might ask about "informal logic" based on Kuhn's conception of science include:

1) Because of the proliferation of texts and approaches is informal logic in a pre-paradigmatic state?
2) Do the various approaches to informal logic each satisfy conditions to be paradigms?
3) Is the development of informal logic a revolutionary paradigm shift? What explains so many different approaches?

Although doing the work to provide justified answers to each of these questions might provide a way to sort through and organize one's understanding about informal logic, I don't believe that the answers to any of these questions are especially informative or useful.

Besides the multiplicity of approaches there are other reasons to consider the possibility that there might be Kuhnian insights for informal logic. There are analogous aspects of informal logic and science that motivate the questions I wish to consider. Both science and informal logic seem to deal with complex ambiguous situations--natural phenomena in the case of science and ordinary discourse in the case of informal logic. Both attempt to provide descriptions or reconstructions of the phenomena with which they are dealing. These reconstructions are idealizations of the natural phenomena with which they deal. With these reconstructions various techniques can be brought to bear to explain and predict in the case of science and evaluate in the case of informal logic. Each wants to transmit both substantive claims and skills. Illustrations and examples play a role in both of these processes. I believe that these analogies open the door for the Kuhnian conception of knowledge in science to provide some interesting avenues to explore in the case of informal logic.

Doing so requires providing both a characterization of my understanding of the tasks and presuppositions of informal logic and, since Kuhn has tended to mean all things to all people, a quick rendition of my interpretation of Kuhn before exploring the possibilities. It is to these tasks that I turn in the next two sections.

## *2.0 Informal Logic – Goals, Concept of an Argument, and Context*

### *2.1 Goals*

There are linguistic, anthropomorphic, psychological, and rhetorical accounts of argument. I take the first three to be descriptive and the rhetorical account to utilize a criterion of persuasion rather than an account that is centered around standards of reasonableness. For the purposes of this paper I am going to consider accounts of argument that provide normative accounts centered around explications of reasonableness.

"Informal logic" or "critical thinking" courses usually have the intent of being "practical" courses, i.e., attempting to teach a useful set of skills rather than examining the theory of argument. The skills are meant to be applicable to ordinary discourse. I believe that for an informal logic course there is a fairly common understanding of the objectives when they are stated abstractly enough. The goals usually include having the students learn to do the following:

1) ascertain whether there is an argument;
2) identify the argument(s) by:
    a. determining the appropriate schematization (form/structure) which applies to the argument(s);
    b. making clear what claims are being made;
    c. ascertaining the relationship intended between premises and conclusion in the argument(s);
3) evaluate the argument(s).

Sub-goals are frequently cited with respect to these tasks, e.g., reading with comprehension and transforming and comparing language.

These tasks of informal logic--finding and evaluating arguments--require knowing what an argument is and since the arguments occur in the context of ordinary discourse having criteria and techniques for identifying arguments in that environment.

### *2.2 Concept of Argument*

A culling from a number of introductory texts provides the following suggested relationships for identifying when a passage contains an argument.

- offer evidence
- provide reasons
- render acceptable
- rationally persuade that the conclusion is true
- rationally persuade that the conclusion is reasonably acceptable
- make a claim seem more believable because of a cogent connection between that claim and the claim cited as its support

- the conclusion, is affirmed on the basis of the others
- the premises are asserted as support or evidence for the conclusion
- claimed to follow from the others
- providing evidence for the truth of that one

However, virtually all, if not all, of these relationships are subject to a variety of interpretations–what counts as evidence? what counts as being a reason?--and these relationships do not provide criteria for judging whether an argument is "good". Consequently more expansive accounts of argument, provided either explicitly or implicitly, follow these initial suggestions.

A basic theory of argument needs to make a number of claims: (i) an ontological claim, i.e., what an argument is; (ii) an evaluative claim, i.e., what a good argument is; (iii) a claim about the relationship between the theory of argument and ordinary discourse, i.e., normative or descriptive; and (iv) a claim about the relationship of the theory to the improvement of argumentative skills with respect to either the production or evaluation of argumentation or both.

There are multiple answers to each of these questions. For example, some different positions on what an argument is are: (i) entailment theory--an argument is an intended entailment; (ii) dialog theory -- an argument is part of the methodical conduct of a critical discussion between parties who are attempting to resolve a difference of opinion; (iii) doubt theory – conclusion claim is doubtful or can be made to seem doubtful. There are also a number of different criteria for reasonableness: (i) logical-–premise/conclusion relationship; (ii) anthropomorphic-–custom; (iii) dialectical–-process.

This is, of course, vastly over simplistic. Despite substantial difference among these positions I believe that much of what I want to say applies to all without having to discuss the differences among them in any detail. Whether descriptive or normative a theory will postulate an idealized structure from which actual discourse deviates in a variety of ways. The descriptive views minimally have to postulate categories so that everything isn't simply *sui generis*. Descriptive theories want to be able to point out commonalities. Normative theories are showing the way things ideally should be. In both cases there will be abstracting from ordinary discourse. Because of this idealizing and abstraction from ordinary discourse one question that will need to be considered is what is involved in applying the theory of argument, whatever it is, to ordinary discourse?

### *2.3. Context*

There are a variety of parameters potentially involved in an argumentative situation – the individuals involved including the arguer as well any individuals functioning as interpreter or audience, the situation in which the argumentative discourse occurs, and the argumentative discourse itself. Thus there are a variety of ways in which there can be context dependency -- knowledge and intents brought to the situation by the individuals; the situation itself taken holistically; the broader environment in which the situation is located.

### *3.0 Kuhn's View of Science*

Kuhn provides both a characterization of the nature of scientific knowledge and an account of the successive stages of scientific development. It is his characterization of knowledge in science in which I am most interested. One of the key features in Kuhn's characterization of the nature of scientific knowledge is the concept of paradigm. In his "Postscript -1969" included in the second and later editions Kuhn acknowledges his ambiguous utilization of "paradigm" in the original edition indicating that "exemplar"–shared examples--and "disciplinary matrix"– a constellation of group commitments--ought to be substituted as appropriate throughout the text. Both of these concepts need to be characterized.

What are the main components of a disciplinary matrix? The non-exhaustive list of components discussed by Kuhn includes: (i) symbolic generalizations; (ii) beliefs in particular models; (iii) values; and (iv) exemplars (Kuhn 1996, 181-187). How do paradigms or disciplinary matrices control science? They make substantive claims about what there is and how the various entities interact with one another. They are the source of the methods, problem field, and standards of solution accepted by the community. They also play a role in what it is that we perceive. Overall they have both a cognitive and a normative function (Kuhn 1996, 103-111). In addition to these functions of disciplinary matrices the characteristics of exemplars are also important.

By "exemplar," Kuhn means "the concrete puzzle solutions that students encounter from the start of their scientific education, whether in laboratories, on examinations, or at the ends of chapters in scientific texts. To these shared examples should, however, be added at least some of the technical problem-solutions found in the periodical literature that scientists encounter during their post-educational research careers and that also show them by example how their job is to be done" (Kuhn 1996, 187). "Close historical investigation of a given specialty at a given time discloses a set of recurrent and quasi-standard illustrations of various theories in their conceptual, observational and instrumental applications" (Kuhn 1996, 43).

What is the kind of knowledge resident in exemplars? "When I speak of knowledge embedded in shared exemplars, I am not referring to a mode of knowing that is less systematic or less analyzable than knowledge embedded in rules, laws, or criteria of identification. Instead I have in mind a manner of knowing which is misconstrued if reconstructed in terms of rules that are first abstracted from exemplars and thereafter function in their stead. Or, to put the point differently, when I speak of acquiring from exemplars the ability to recognize a given situation as like some and unlike others that one has seen before, I am not suggesting a process that is not potentially fully explicable in terms of neuro-cerebral mechanism. Instead I am claiming that the explication will not, by its nature, answer the question, 'Similar with respect to what?' That question is a request for a rule, in this case for the criteria by which particular situations are grouped into similarity sets, and I am arguing that the temptation to seek criteria (or at least a full set) should be resisted in this case. It is not, however, system but a particular sort of system that I am opposing" (Kuhn 1996, 192).

How is the practice of normal science carried out? "The practice of normal science depends on the ability, acquired from exemplars, to group objects and situations into similarity sets which are primitive in the sense that the grouping is done without an answer to the question, 'Similar with respect to what?' One central aspect of any revolution is, then, that some of the similarity

relations change. Objects that were grouped in the same set before are grouped in different ones afterward and vice-versa" (Kuhn 1996, 200).

Another aspect of Kuhn's view is that normal science is puzzle solving. For Kuhn characteristics of puzzles include: " that special category of problems that can serve to test ingenuity or skill in solution" (Kuhn 1996, 36); "intrinsic value is no criterion for a puzzle, the assured existence of a solution is" (Kuhn 1996, 37); "There must also be rules that limit both the nature of acceptable solutions and the steps by which they are to be obtained" (Kuhn 1996, 38).

To summarize what I take to be the salient aspects of Kuhn's position for possible insights in informal logic: relevancy, structural relationships, and perceptual importance are dependent on the assumptions of the disciplinary matrix (theory); and both the application of knowledge and teaching are crucially bound up in exemplars instead of being rule-governed activities.

On the basis of these views about the situation in informal logic and Kuhn's views the following questions arise:

1) What are the dependencies encountered in informal logic? What aspects of informal logic are theory dependent?
2) Is there a role for exemplars in informal logic?

## *4.0 Context and Theory Dependencies in Informal Logic*

There are clearly aspects of understanding what claims are being made in ordinary discourse that are not dependent on having a concept of argument. Examples include instances of ambiguity and vagueness. This is not to say that understanding these aspects of ordinary discourse is not an important aspect of argument evaluation, but merely that recognizing that they are occurring and resolving them doesn't require a prior concept of argument. However, context dependency is certainly generally acknowledged. Certain aspects of theory dependence also are widely accepted. That the theory you are deploying informs you what the parameters to pay attention to is one of those aspects.

### *4.1. Context Matters*

The various theories of argument differ in the extent to which context plays a role. One might be tempted to believe that the view that entailments are arguments eliminates the need to consider context, but even this view has a certain context dependence. What are the criteria for ascertaining that there is an argument on the entailment theory? I don't believe that every possible entailment whether intended or not is likely to count as an argument. Moreover, the test cannot be that there is an entailment because the possibility that the argument is a bad argument needs to remain open when determining whether there is an argument. So when logically correct entailment and good argument are considered to be identical there still needs to be some separate grounds, such as intent, for determining that an argument is present.

In contrast some of the other positions explicitly acknowledge that not all intended entailments function as arguments and utilize contextual aspects to distinguish between arguments and other linguistic entities that rely on entailments, e.g., explanation. Explanation starts with a claim known to be true and attempts to determine the appropriate claims that would entail it. Simply being entailed is not sufficient to count as an explanation or count as a "good"

explanation. Mathematics is an interesting case in which the same entailment can function as both an argument or proof for a claim as well as explanation as to why it is true. However, elsewhere, lack of context may make it unclear whether one is dealing with an argument and or an explanation.

In fall semester Bill, who is the quarterback on the football team, is the best player on the team. It is also known that he attended a high school sports camp during the prior summer and was the only player who did. Is he the best football player on the team because he attended the summer sports camp--an argument or did he attend the sports camp because he was the best football player--an explanation? It depends on what you take the situation to be. If your concern is to convince someone he is the best player, then you are providing the argument. However, if it is agreed that Bill is the best player, then you are providing an explanation.

There are other ways in which context matters. Background knowledge, judgment, and discretion are relevant to argument interpretation as are social and dialectical contexts. Even one's assessment of the truth of the premises depends on what one knows.

*4.2. Theory Makes a Difference*

There are examples where the theory of argument you hold does make a difference. What will be identified as an argument differs according to the view of argument held. If an intended entailment is identified as an argument, then there are clearly valid deductive entailments which will be identified as arguments, e.g., addition, conjunction, or repetition

| | | |
|---|---|---|
| P | P | P |
| PvQ | Q | P |
| | P&Q | |

However, most individuals not schooled in formal logic are generally reluctant to consider these as arguments and they would be rejected by numerous non-entailment theories of argument.

It is also the case that evaluation criteria adequate for ensuring that we have a "good" argument also depend on the theory adopted. As an example, consider the following argument:

> All males who take birth control pills will not become pregnant.
>
> John Jones is a male who takes birth control pills.
>
> John Jones will not become pregnant.

This argument satisfies the deductive criterion of logical correctness--the truth of the premises is sufficient to guarantee the truth of the conclusion, e.g., it is a good entailment. The argument also has true premises: the first premise is an empirical truth and, since John Jones is my creation, I can give him whatever odd chemical dependencies I choose. Consequently, the argument satisfies both of the standards--deductively validity and soundness--customarily given by those who espouse an entailment theory. However, the customary intuitive reaction is that this not a "good" argument.

In this particular case the way in which the argument goes awry is fairly clear. We believe that being placed in the category of being male is sufficient to guarantee that the individual will not become pregnant. Consequently, we believe that a stronger argument would be:

> All males will not become pregnant.
>
> John Jones is a male.
>
> John Jones will not become pregnant.

In this case our background information informs us that the original argument was not utilizing the best reference class. Ultimately we are not only looking for an argument which is logically correct and has true premises, but one which we regard as the strongest argument available for the conclusion. Entailment theorists could add a strength requirement to cover this situation, but it is not part of the usually enunciated standards on that view whereas such a requirement is an integral part of some of the alternative views.

### *4.3. Underdetermination by Evidence, Context, and Theory*

While theory and context play critical roles in determining whether we have an argument and if the argument is "good" the claim being made is not that knowing both theory and context will always make clear how to interpret and evaluate a passage.

A frequently occurring situation is one in which what is in common between two specific entities is what is at issue--one way to deal with this situation is to generalize on the basis of the initial case and then show that the second case falls under that generalization. A second way is to construct an argument by analogy between the two specific situations. In the first case one is constructing an abductive argument and in the second an argument by analogy. Consider the following situation:

> It is wrong for a doctor to lie to a person about a test result, even if the doctor thinks that lying is in the patient's best interest. We know this because even doctors would agree that it would be wrong for a financial adviser to lie to them about a potential investment, even if the financial adviser thinks that this lie is in the doctor's best interest.

An analogical interpretation would be:

> A financial adviser lies to a client when he thinks doing so is in the client's best interest.
> A doctor lies to a patient when she thinks doing so is in the patient's best interest.
> Both are professionals dealing with a client.
> The financial adviser is morally wrong.
> ==========
>
> The doctor is morally wrong.

An alternative interpretation of the argument is that it abduces a general rule about lying from the example of the financial adviser and then uses this general rule to apply to the case of the doctor. The argument starts from the view that we would all agree that it is wrong for a financial adviser to lie to any customer on the ground that the financial adviser believes lying is in the interest of the customer. There is an implicit general rule that supports this view - that professionals should tell clients the truth and allow them to determine what is in their best

interest. Once this general rule is abduced from the case of the financial adviser, it can be applied to the case of the doctor and shown that it is wrong for doctors to lie to patients.

It is wrong for a financial adviser to lie to a client when he believes it is the best interest of the client

==========

Professionals should tell clients the truth and allow them to determine what is in their best interest

A doctor is a professional.

It is wrong for a doctor to lie to a patient when she believes it is in the best interest of the patient.

Here we have a serial argument or an argument chain where the conclusion of the abduction is also utilized as a premise in the second deductively valid argument. This example obviously presents an overly simplistic instance of the issue of professionals lying to clients.

In both science and ethics both argument strategies are utilized. In science the abductive form is generally favored when both of the phenomena being considered are natural phenomena, but the analogical version occurs when natural phenomena and models of them are being considered. Here there is a difference in context. In the assessment of two acts in ethics there is not such an obvious difference in context to help determine the favored interpretation.

### *5.0. Reading with Comprehension*

The argumentation found in ordinary discourse can range from the simple and straight forward to extraordinarily complex. Rarely is an argument in all of its complexity apparent merely on inspection or an initial reading. Usually arguments need to be reconstructed. To achieve this one needs to read the passage with comprehension. What is involved in argument reconstruction and reading with comprehension?

Understanding the substantive claims can be context dependent in the sense that not all of the required information is provided explicitly in the substantive claim being considered, but can be obtained more indirectly from the context. For example, the utilization of context to determine the referent of indexical words or to eliminate the omnipresent potential ambiguity because words have more than a single meaning. This appears to be independent of both theory and purpose.

Separating argumentative discourse from other types is a component of identifying arguments. Partly this is done by recognizing the different functions of the sentences. Different possible functions of sentences are relevant. These include: (i) make an assertion; (ii) interrogative function; (iii) directive function; (iv) request function; (v) rhetorical function; (vi) performative function; and (vii) a persuasive function. Many of these functions could be further broken down. For example, an assertion could be a description or a comparison. However, recognizing that an argument is present requires more than just understanding the substantive claims. It also requires making a judgment about the existence of a relationship.

There are undoubtedly cases in which all would agree that an argument is present. However, as we have seen, both the theory of argument held and the contextual elements of the discourse in which the argument candidate occurs can be relevant factors in determining whether

an actual argument is present. Interpretation and comprehension of a passage appear to depend on both the fact that one is attempting to identify argumentative discourse and the theory of argument held.

Because it is comprehension for a purpose, factors relevant to that purpose assume a greater weight in the process. It is the theories relevant to achieving that purpose which inform us what those factors are. In informal logic the purpose is the reconstruction of arguments and their evaluation. Thus any parameters associated with argument identification and structure become relevant to comprehension. In this situation determination of the significant aspects of context are theory dependent--the theory tells you what aspects of the situation or context you need to pay particular attention to.

Arguments are constituted of various components, e.g., claims, structures, etc. What are the relationships between these various components? There are several approaches a theory of argument might take--a compositional/component approach or a more contextual/holistic approach. On the compositional approach each component is regarded as capable of relatively independent treatment while on the other components need to be treated in relationship to one another as well as the overall context in which they occur. On the first view reading with comprehension is the understanding of the basic substantive claims being made in the passage, which occurs independently of argument structure and evaluation. Understanding some of the claims may be context dependent, but is not seriously theory dependent. The second interpretation makes understanding the argumentative structure as well as the evaluation of argument candidates an inherent component of basic comprehension of the passage.

Looking at serial compound arguments supports the claim that overall argument structure can affect the interpretation or comprehension of a claim. For example, argument structure could have an impact on how to interpret a sentence as simple as "X's are Y's" where no quantifer is present.

Some M are Y.
<u>All M are X.</u>
X are Y
<u>All Z are X</u>.
All Z are Y.

The first single argument suggests that the particular interpretation would be preferred in order to make that argument form valid. However, a universal interpretation is what would make the second single argument deductively valid. Which way should it be interpreted? The argument structure as well as contextual clues are relevant.

It appears that reading with comprehension for the purpose of argument reconstruction can, at most, be theory independent at the level of understanding substantive claims, but even that is not always the case. Reading with comprehension is theory dependent in a fundamental way.

If this claim is accepted, what are the implications for the presentation order of material in textbooks and courses? Some possible initial suggestions: early introduction of arguments and a sense of what is involved in desirable premise/conclusion relationships rather than starting with getting clear on substantive claims seems desirable; anything which encourages a piecemeal approach should be avoided; courses using different approaches could be designed and then assessed for effectiveness; reviewing texts to see how they deal with this issue could be

informative. However, these are simply preliminary thoughts which would need to be worked through in more detail.

### *6.0. Reconstruction*

There are numerous steps involved in reconstruction: (i) understanding the substantive claims made in the passage; (ii) identifying whether an argument is present; (iii) paraphrasing to achieve an argument in "standard logical form". This last is itself a complex process involving: (i) clarification; (ii) elimination of vagueness; (iii) elimination of redundancy; (iv) elimination of irrelevancy; (v) elimination of stylistic variation; (vi) ascertaining the contributions of context; (vii) supplying missing claims; and (viii) showing structure. The result is an abstracted and idealized structure and not what is usually directly encountered in ordinary discourse.

Accomplishing a reconstruction is a multidimensional problem. A determination must be made that each of the component steps has been satisfied in order to achieve a reconstruction.

To what extent can rules for this overall process be provided?

#### *6.1. The Possibility of Rules for Argument Reconstruction*

One might take the question to be whether it would be possible to write a general argument recognition and specification computer program:

> "Questions such as these do have answers, but not always uniquely "correct" ones. Ordinary language is far too complex for us to be able to write a *general* argument-recognition program. There is no algorithm, or set of precise instructions, by which a person or machine, presented with an arbitrary body of actual discourse, can mechanically pick out in a finite number of steps just those sequences of sentences that are associated with the appropriate claims and thus constitute arguments." (Blumberg 1976, 21).

But there are more liberal construals of "rules" than as algorithms. In the "Poverty of Formalism" Govier has dealt with this issue of whether there are rules for argument interpretation. She considers four sorts of rules; (i) strict formal rules--syntactic and hold universally; (ii) strict material rules--non-syntactic but hold universally; (iii) general rules-- hold most of the time, but have a ceteris paribus clause; and (iv) rules of thumb--rough guideline for action (Govier 1999, 90).

Govier argues, and the previous discussion also shows, that any such rules could not hold with strict universality. This eliminates the first two types of rules. On the other hand rules of thumb despite being called "rules" are, at best, indicators. They lack the systematicity to be true rules. Rejecting them as rules does not mean they are not useful as their frequent inclusion in informal logic texts attests. The plausible candidate is a rule with a *ceteris paribus* clause. But then how do we deal with the application of *ceteris paribus* clauses? The application of such clauses appears to require either an exhaustive listing of the conditions under which the *ceteris paribus* clauses apply or a set of rules is available to govern their application. The exhaustive listing presupposes knowing all the situations in which the *ceteris paribus* clauses are applicable – something the inclusion of the clause tacitly acknowledges is not the case. Rules for applying rules raise the specter of infinite regress.

What are the alternatives for systematic guidance in reconstructing arguments?

*6.2. An Exemplar Approach*

Kuhn's concept of "exemplars" as the carrier of cognitive content suggest an alternative way to view this situation. Exemplars represent tacit knowledge. The knowledge carried by exemplars can't be fully expressed in explicit rules. Exemplars make classification extensional and based on similarity judgments and relationships. The definition of the concept is implicit in its instances; no explicit definition is abstracted. Consequently, information about correlations of features, acceptable feature values, and realizable concept instances is preserved in the instances.

Not all instances function as exemplars. This is reflected by the considerable number of words for designating specific instances: case; exemplar, example, illustration, model, pattern, prototype, exercise. Their definitions indicate various distinctions among them. Some "instances" just fall under the concept--case, example, illustration--but have no special standing. Other instances are taken as especially representative or "ideal"--model, prototype, exemplar, archetype. Specific instances also have various functions: to illustrate; to clarify; to introduce new situations or at least new features; and to serve as a model.

On an exemplar approach there are "worked examples" which represent a variety of paradigmatic situations that are encountered with a degree of frequency. New problem situations are presented and similarities with previous worked examples are pointed out, various adjustments are made to rearrange the new situation to make it more similar to the old or to be able to view it as a generalization of the earlier situations, then techniques which worked to achieve a solution in those previous cases are utilized. In informal logic divergent, convergent, and linked arguments would each form the bases for a paradigmatic situation with generalizations consisting in compound arguments that are combinations of the simpler situations.

In physics the exemplars do not start with complicated situations, but instead rather simplistic and stylized ones. Why are stylized examples important? This allows for the gradual introduction of complexity and of the need to deal with large numbers of tasks on a simultaneous basis. My assumption is that doing so is pedagogical useful and that it is psychologically more efficacious to learn only one task at a time. What does this approach say for starting with natural language examples?

What are the advantages of an exemplar approach? Making similarity judgments seems teachable in ways that rules of thumb do not. They are showing the role of the overall situation or context in a way that rules of thumb do not. This could enable one to make better judgments about when a rule of thumb applies and when it does not. It encourages not taking each aspect of argument interpretation as a separate step.

What are issues connected with teaching and learning with exemplars? Two general problems are: (i) what are the strategies to find matching cases and (ii) what is a necessary knowledge base of cases and how is it acquired? Sub-questions of the first include: (i) how are cases indexed for efficient retrieval? (ii) how is the similarity between a new problem and a retrieved case assessed? Sub-questions of the second include: (i) how should cases be selected for inclusion in the set of exemplars? (ii) how is indexing information learned? (iii) how is additional domain knowledge required for the assessment of similarity acquired? (iv) how does generalization occur during learning? (Bareiss 1989, 96). How would students learn from the new cases that they attempt to resolve on their own? Possible learning mechanisms include – acquiring new exemplars from situations in which there is no recognition of the relevant

similarity; generalizing from partial successes; eliminating candidate cases for inclusion as exemplars if they don't prove useful in new cases.

The Kuhnian conception of exemplars and their role also suggests that problems provided as exercises should be selected in a way to facilitate development of a strong exemplar base. Problems need to be viewed not just as an opportunity to practice skills and also transfer skills. In informal logic this means not only new situations, but also more complex situations such as ordinary discourse. Questions that might be asked: Provide practice at what? Is it simply reconstructing arguments or is it reconstructing arguments under particular circumstances? What role does transferability play in problem selection? How efficacious is it to group exercises together that deal primarily a single problem? What is the role for problems that contain little or no context? Is there an optimal way for introducing complicated problems from ordinary discourse? What is an appropriate mix of problems with respect to those that contain good arguments and those which deserve criticism?

### *7.0 Concluding Remarks*

This paper has attempted to explore and provide support for the following claims:

1) Exemplars provide a non-rule based method for learning how to put argumentation into standard logical form.

2) A distinction should be made between the two different types of context dependencies -- theory independent and theory dependent.

3) Reading with comprehension for the purpose of argument reconstruction is fundamentally a theory dependent activity.

Accepting these claims raises numerous questions to be explored regarding texts, course presentation, and teaching strategies for courses in informal logic.

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