ISSA Proceedings 2002 – Inventional Capacity

Inventional capacity refers to the size of one's stock of available arguments in a given situation. The elements in one's repertoire are generated in one of three ways: the argument is directly recalled from memory, or it is recalled and then edited to adapt it to the immediate circumstance, or it is completely invented from whole cloth (Waldron 1990). Arguments that are made public, first exist cognitively (Hample 1985).

The main task of this paper is to summarize a number of recent unpublished experiments that offer information about inventional capacity. Before doing so, however, perhaps a brief description of the importance of this idea in both classical rhetorical theory and contemporary message production theory might be in order.

1. Theoretical Background

This is surely not the place to trace the whole history of invention in rhetorical theory, and I am not the person to do it anyway. Instead, let me begin with some focused attention on a single passage from Cicero's *Topica*.

That book was written in response to repeated requests by Trebatius, a protégé of Cicero's who acted as liaison between Cicero and Caesar. Trebatius found Aristotle's *Topics* in Cicero's library, but wished to have a more readable account because Cicero had assured him that ". . .these books contained a system developed by Aristotle for inventing arguments so that we might come upon them by a rational system without wandering about. . . ." (*Topica*, I. 2). This sets the stage for the points I wish to make. For Cicero, invention is systematic, rational, and efficient. It is something done on purpose, done by study.

Soon thereafter comes the passage I wish to reflect upon. The substantive beginning of the book is this: "Every systematic treatment of argumentation has two branches, one concerned with invention of arguments and the other with judgment of their validity. . . ." (*Topica*, II. 6). Cicero credits the Stoics and their writings on dialectic with having made great contributions to the second branch, judgment. Aristotle and his *topoi*, however, are Cicero's main source of

inspiration regarding invention. Some of these topoi are intrinsic, and include the whole, the parts, the meaning, and those things closely connected to the thesis. Extrinsic topoi are, of course, external to the nature of the subject, and mainly involve proof by authority (XIX. 72 – XX. 78).

This is an important theoretical statement about argumentation. Cicero clearly distinguishes between the generation of possible arguments and the testing of them, and that distinction is at the heart of this research program. I depart from Cicero in detail, however, and wish briefly to say why.

The first branch of Ciceronian argumentation is invention, which consists mainly of the topoi. The topical systems have always struck me as *post facto* and unhelpful to the creative process. Given enough time to prepare, one might make constructive use of the topoi. But in the moment, one may simply have to argue, and circumstances do not often permit time to work through the lists of topoi.

Actually, Cicero shows some sensitivity to this hesitation in another work. In *De Oratore* the participants debate whether or not rhetoric is an art. Crassus makes this comment: "If however the actual things noticed in the practice and conduct of speaking have been heeded and recorded by men of skill and experience, if they have been defined in terms, illuminated by classification, and distributed under subdivisions – and I see that it has been possible to do this – I do not understand why this should not be regarded as an art. . . ." (I. 109). This displays my own understanding: that the topoi and other rules are after the fact, things noticed in the practice of successful orators. Though substantial energy invested in working through the lists of topoi and *stases* could produce some good inventions, I am doubtful that even those carefully trained in classical rhetoric do this very often. I think they mainly just argue.

The second part of argumentation is judgment. Arguments can certainly be tested dialectically, but this is the only method Cicero has in mind. This seems overly restrictive, for two reasons. First, dialectic is solely concerned with rational testing, and other factors (e.g., politeness) are also reasonable tests of an argument. Second, dialectic is inherently public, and always involves two or more people. This misses the private approximations to dialectic that a single person might construct in thinking through an argument prior to utterance.

So the merit I find in Cicero is the sharp distinction between invention and judgment, and the recognition that these are the two aspects of argumentation. My objection to what he says on both heads is the same, that his descriptions are too unnatural to describe what people actually do. More useful material is found

in recent theories of message production.

In that work, the idea of repertoire is recurrent. Most theories take it as a starting point. The compliance-gaining tradition, for instance, uses explicit lists of messages, and asks respondents to choose the ones they would be willing to utter (see Wilson 1997). Greene's (1997) action assembly theory sees messages as having been assembled from components stored in memory. Berger (1997) says that people speak from plans that contain pre-existing messages. Kellermann (1995) shows that we have memory organization packets for episodes, and how these little theories of what might happen contain what can be said at each anticipated point. Hample and Dallinger (1987, 1990) presume that people have repertoires of possible arguments, and that they select the ones that best suit the actor's immediate goals. Several theorists, such as Dillard (1990) and Meyer (1997), make use of the goal-plan-action model. This theory says that goals activate pre-existing message plans, which contain the messages. O'Keefe and Lambert (1995) argue that messages take their content from a reading off of the thoughts stimulated by the interaction. Several scholars (Berger 1997; Hample 2000; Waldron 1990) have noticed that the messages may not come cleanly out of the repertoires, because some sort of modification may be needed. The common thread in all these theories is the idea that the repertoires exist prior to the episode, and that messages are activated by circumstances.

But this is mostly a theory of recall, not of invention. We have a welter of accounts describing how materials are discovered in memory. In 2000 years, our discipline has done very little to study how content can be freshly created. Nor have we done much in the way of predicting the nature of people's repertoires. The inventional capacity research program has the goal of eventually redressing these two deficiencies.

2. The Empirical Record to Date

Several studies have now investigated the idea of inventional capacity. These have been exploratory in nature, and have mostly concerned themselves with the nature of the construct. It is understood as an individual differences variable. These first studies have clarified what sort of individual difference it is, have explored whether it depends on the situation that calls for arguing, and have investigated a few features of the repertoires themselves. In reviewing this work, I will begin by explaining how inventional capacity is operationalized, and then move on to the substantive results.

2.1 Operationalization

The measurement of inventional capacity is reasonably simple. Respondents are presented with a description of a stimulus situation, asked to imagine that they are actually participating in it, and then to list up to 15 things that they could say in that circumstance. The measure of inventional capacity (IC) is the number of items listed. Most of the work has been done with persuasion situations, although some studies have examined comforting, initial acquaintance, and forgiving. All of the stimuli end by indicating the goal (e.g., "You initiate an conversation in order to forgive him/her").

Table 1 Descriptive statistics

Study	Stimuli	N	IC Mean	ICSD	% with 15
Hample, Quinton, et al. (2000)	P	110	9.2	3.6	18%
Hample, Grismer, et al. (2000)	P	108	5.9	3.1	4%
Hample, Gonzalez, et al. (2002)	P	114	5.7	2.7	2%
Hample & Wang (2001)	F	136	6.0	2.9	1%
Hample, Hammond, et al. (2002)	P, C, IA	297	6.9	3.1	2%

Table 1: Descriptive statistics

Table 1 contains a few descriptive results from the studies so far, showing type of stimulus, sample sizes, means, standard deviations, and the percentage of respondents who listed 15 items. The stimuli are abbreviated as follows: P represents persuasion, F forgiveness, C comforting, and IA initial acquaintance. These results indicate a reasonable amount of variation in the means, and also suggest that 15 is an acceptable upper limit for the listing task.

2.2 The Nature of the Individual Difference

Plainly, people differ in their inventional capacities. What sort of individual difference is this? We have investigated two possible answers, trait and ability. A trait is an enduring personality characteristic, a predisposition to behave in a general way. Examples of traits are extroversion and communication apprehension. A cognitive ability, on the other hand, is a measurement of cognitive architecture or dynamics. Intelligence and accuracy of recall are abilities, for instance. We have explored this issue with designs that permit us to correlate inventional capacity with various ability or trait measures.

Our intuition at the start of the program was that inventional capacity is probably an ability, and the initial studies reflect that orientation. The first studies tested the association between inventional capacity and a range of individual differences measures. The abilities tested include academic performance, creativity, and

interpersonal construct differentiation. The traits were argumentativeness and verbal aggression. For the most part, our results indicate that inventional capacity is predicted by several abilities, but is not associated with the trait measures.

Academic ability was assessed by obtaining respondents' consent to gather their grade point averages and ACT scores from university records. In Hample, Quinton, et al. (2000) inventional capacity was not associated with these measures, although the correlations with several of the English subscales of the ACT approached significance. However, Hample, Grismer, et al. (2000) do report significant correlations between inventional capacity and GPA (r = .31), and several of the ACT subscales (English, r = .40; reading, r = .39; English usage, r = .40; rhetorical skill,
r = .37; arts, r = .36; social science, r = .36; and math, r = .30). Considering both studies together, it seems safe to conclude that inventional capacity is associated with verbal ability, and perhaps with other intellectual measures as well.

Perhaps the most common way to understand creativity is to conceptualize it as divergent thinking. We measured it in two ways (Hample, Quinton, et al. 2000, drawing the measures from Getzels & Jackson 1962). In the Uncommon Uses Test, people are asked to list novel uses for various objects, such as a brick. The Word Association Test requests respondents to list as many definitions for a word (e.g., duck) as they can. Inventional capacity is positively associated with both instruments. The uncommon uses instrument correlates with IC at r = .38, and the word association measure at r = .30.

The last ability variable is interpersonal construct differentiation. Assessed with the Role Category Questionnaire (see Burleson & Waltman 1988), this is a measure of cognitive architecture. People with high RCQ scores have more differentiated, more varied, more developed perceptual systems to apply when interacting with others. We felt that since interaction is a central element in both argument production and person perception, the two cognitive architectures might well develop in tandem, having comparable levels of sophistication in a given person. In fact, RCQ scores are highly correlated with inventional capacity in both persuasive situations (r = .49; Hample, Grismer, et al. 2000) and forgiveness situations (r = .46; Hample & Wang 2001). However, Hample, Gonzalez, et al. (2002) report that their correlation, while positive (r = .16) is not statistically significant.

To date, we have compared inventional capacity with only two trait measures,

argumentativeness (Infante & Rancer 1982) and verbal aggression (Infante & Wigley 1986). Even if inventional capacity is really an ability measure, we thought it might manifest itself in predispositions to argue or to be verbally aggressive. People high in inventional capacity, after all, have larger repertoires and more verbal facility. We thought they might therefore seek out argumentative interactions. However, neither construct is significantly associated with inventional capacity (Hample, Grismer, et al. 2000).

We do not rule out the possibility that inventional capacity will turn out to have reliable associations with some personality traits. However, we are confident in saying that inventional capacity is most immediately reflective of intellectual ability, and any future finding of association with traits will need to be explained in those terms.

2.3 Situation

We also wish to know how stable inventional capacity is. Another way of asking this question is to inquire how much effect situation has on IC scores. If inventional capacity were completely stable, we should obtain the same IC scores from a given person regardless of the situations s/he is responding to. On the other hand, people might have different inventional abilities for different circumstances.

Our work has followed three paths on this issue. First, we have used several different instances of the same general goal. For instance, in the studies using persuasive stimuli, we distributed 3 or 4 different persuasive situations within each sample. Second, we have used different goals. Besides persuasion, we have examined IC scores for comforting, initial acquaintance, and forgiving. Although it is sometimes a stretch to describe initial acquaintanceship tactics as arguments, people tend to respond to persuasive, comforting, and forgiving situations by giving reasons.

Within a general category of goal, IC scores are generally unaffected by specific instantiation. Hample, Quinton, et al. (2000) used 4 different persuasive situations, and found that IC scores did not discriminate between them. The same result appears in Hample, Grismer, et al. (2000), which used 4 other persuasive situations. Hample and Wang (2001) used 6 different forgiveness situations in their design, and report that IC scores are essentially the same for all 6 instantiations. Finally, Hample, Hammond, et al. (2002) used 3 persuasive situations, 3 comforting stimuli, and 3 initial acquaintance situations. Instantiation did not make a difference within persuasion or initial acquaintance

goals, but a significant effect appeared for comforting (eta_2 = .06). The comforting results may be worth following up. But when people have persuasive goals, our data indicate that they will have essentially the same IC scores regardless of the situational details.

A second strategy used to explore the possible relationship between inventional capacity and the stimulating situation has been to describe the situation in finer detail. Hample, Gonzalez, et al. (2002) asked respondents to rate persuasive situations in terms of several goals suggested by Dillard (1990). These goals are to influence the other, to protect own identity, to preserve the interaction, to protect the relationship between persuader and target, to preserve personal resources, and to manage own arousal. None of these correlate significantly with inventional capacity, again suggesting the idependence of this ability from immediate circumstances.

The last approach in studying situation has been to compare different goals. In Hample, Hammond, et al. (2002), persuasion, initial acquaintance, and comforting goals were compared. The mean IC scores for the 3 goals were all in the range from 6.8 to 7.1, and the differences were not significant. Hample and Wang (2001) only collected data on forgiveness situations, but they compared the mean IC from the forgiveness data to those obtained in earlier studies, and they, too, report that goal type does not affect IC scores.

In Hample, Hammond, et al. (2002), each person actually responded to two different situations that differed in goal type. This permits a correlation between the IC score for the first goal/situation and the second. This correlation is significant (r = .72). This result not only supports the conclusion that inventional capacity is stable across situation types, but also offers a lower limit estimate of the instrument's reliability.

In sum, research on situational effects supports the conclusion that inventional capacity is fairly consistent across the various goals and specific situations that we have studied. The ability to generate possible arguments appears to be quite a stable one.

2.4 The Nature of the Repertoires

Exploration of the contents of people's repertoires will probably prove to be one of the more interesting topics in the research program. We can offer results bearing on three issues, the politeness of the repertoires, their creativity, and their content types.

The question of repertoire politeness was raised in a different research program. Hample and Dallinger (1998) tried to explain why people's arguments become ruder after a rebuff. That is, if a person makes a persuasive appeal, has it refused, and decides to persist, the second message will be more aggressive than the first one. Hample and Dallinger speculated that this might happen because people's editorial standards change after one or more rebuffs, such that arguers become less concerned about politeness issues. In fact, they obtained support for that hypothesis. However, they were aware that another, independent, explanation for the effect was also possible. This is the repertoire exhaustion hypothesis, which suggests that when people have to give a second or third argument, they must move down lower into their repertoires. If the prosocial messages are higher in the repertoires, as seems plausible, then perhaps the rebuff phenomenon occurs because people have run out of polite messages after being rebuffed. Repertoire exhaustion and changing editorial standards could both be happening simultaneously. Consequently, the finding that editorial standards do change does not rule out the exhaustion hypothesis.

Hample (2001) analyzed the persuasive repertoires from the Hample, Grismer, et al. (2000) and Hample, Quinton, et al. (2000) studies. Each listed item was rated as to its politeness, and those politeness ratings were compared to the ordinal positions of the items. For the repertoire exhaustion hypothesis to be correct, the first-listed messages should be rated as more polite than those at the end of the lists. In general, however, the mean politeness ratings for the listed messages were essentially the same, regardless of whether the items were listed early or late in the repertoires. What this means is that people do not need to sacrifice appropriateness in order to generate additional arguments. This is an interesting result.

Besides politeness, we have obtained some results bearing on the creativity of the repertoires. In addition to listing what they might say, respondents are also asked to rate each listed item as to its usualness. Our original hope was that we would see clear breaks in the usualness scores as we moved down through the repertoires. We expected the first-listed items to have been easily retrieved from memory, and the later items to have been invented with more difficulty.

These considerations prompted us to compare mean usualness ratings within the repertoires (i.e., the first item's usualness to the second item's, to the third item's, and so forth). Hample, Quinton, et al. (2000) found a significant decline in usualness as one moves downward through the repertoires. Hample, Grismer, et

al. (2000) replicate this result (eta_2 = .05). The pattern does not appear in Hample and Wang's (2001) study of forgiveness messsages.

But even in the persuasion studies where a decline in usualness appears in the data set, we do not see the breaks we had hoped would give us guidelines as to how many arguments are normally retrieved, how many are retrieved and edited, and how many are genuinely invented in the moment. In every study to date, the mean usualness rating for every ordinal position (1 through 15) is above the theoretical midpoint of the usualness scale. Since nearly all our respondents quit listing new arguments before they arrive at the limit of 15, we may have failed to generate a research design that captures or requires genuine inventions.

A recent study (Hample, Elliott, et al. 2002) coded the inventions provided by respondents in Hample, Quinton, et al. (2000) and Hample, Grismer, et al. (2000). We found that 87% of the items are argument-relevant. Almost two-thirds of the inventions are coded as reasons. About 10% state conclusions. This is an important result, because the format of the inventional capacity instrument leaves people free to write whatever they want. Items such as "how are you doing today?" appear on the lists, but such substantively-irrelevant messages are in the minority. The inventional capacity instrument does, in fact, capture argument repertoires. Further, the statistical analyses in that investigation show that the leading correlates of inventional capacity are explained by the argument-relevant content, not by the materials that bear only on politeness issues.

We have only begun to examine the contents of people's argument repertoires. So far, we can say that extra inventional activity does not seem to sacrifice appropriateness. Somewhat more novel arguments appear at the ends of lists than at the beginnings of them. And people do respond to this measuring procedure by providing argumentatively relevant material.

3. Conclusions

Inventional capacity is a new research program, of course, and its main contributions may still lie ahead. These early studies have some merit, however, in mapping the conceptual landscape. Arguing is a skill, which may be done well or poorly (Hample, in press). Both motivation and ability are critical in predicting a person's skill level in a given circumstance. Inventional capacity would seem to be part of the ability component of arguing skill. Argumentation is, after all is said and done, mainly about content. To argue well, one must have good content, and that means that one must have a repertoire with at least some high quality items.

One of the goals of the research program is to improve our descriptions of

inventing. Classical rhetorical theory does not seem very useful in either describing how people actually generate content, or in giving prescriptive advice when the arguer has little time to prepare. Contemporary theories of message production are mostly about recall, and appear to have minimal interest in creativity. It is a commonplace that the first canon of rhetoric includes both discovery and invention, but our community treatment of invention – whether rooted in classical theory or modern cognitive science – is rather sterile. Perhaps research on inventional capacity can help address this problem.

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