# Criteria for Regarding Group-group Differences in Cognition as "Cultural" Differences

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# Abstract

This paper suggests some additional criteria (beyond simple group-group differences) that need be met in order to speak of contrasting habitual modes of thinking/doing as "cultural" differences. In particular, referring to group-group differences as cultural differences also implies:

(a) there is some social-learning mechanism of transmission underlying the observed habits-of-mind, and

(b) á la Durkheim, the distinctive habits-of-mind have some normative force, in the sense of being regarded as the 'correct' or ‘appropriate’ way of thinking/doing things.

# Preview

1. Why this topic?
2. Brush-clearing
    a. Group-group differences … not adequate criterion of culture
    b. Sharing … not adequate either
3. Criteria for “culture”
4. Examples involving problem-solving
    a. Alaskan salmon seining
    b. Nova Scotian herring seining
5. Ending

# Why am I talking about this topic?

- Good question! Well, I've read a few papers and heard several talks at meetings that go something like this:
  - Individuals from two "cultural" groups – e.g., Bongo-Bongo and Glick-Glick – are given some sort of cognitive task or problem to solve.
  - Individuals do the task independently of one another; results are tallied.
  - The two groups show a statistically significant contrast with respect to the task.
  - Conclusion = culture affects cognition.
- My reaction… *Nice empirical study; interesting contrast. But, seems like a little more is needed to justify the conclusion.*

  To me, "culture" entails more than just group-group differences: we need to establish ***WHY*** individuals come to resemble some people more than others.

# Brush-clearing

Stuff I could probably leave out, but seemed sort of relevant.

# … "group-group contrasts"

- Group-group cognitive differences are definitely interesting … because the default is to regard cognitive abilities as reflections of our species' evolutionary history – as part of human nature, the psychic unity of humankind.
- On the other hand … Beliefs, practices, etc., certainly do NOT have to be unique to a group to be parts of cultural traditions, AND such traditions may well include alternative or even competing beliefs, practices, and habits of mind (intra-cultural diversity is normal).
- Conversely, just because groups differ with respect to beliefs or practices does not, ***by itself***, indicate the observed differences are "cultural" differences. Like primatologists trying to identify non-human primate cultures, we must rule out other possibilities, such as
  - genetic differences underlie the observed contrasts; and
  - the contrasts are simply responses to differing environmental features.

  and, the differences must meet additional criteria.

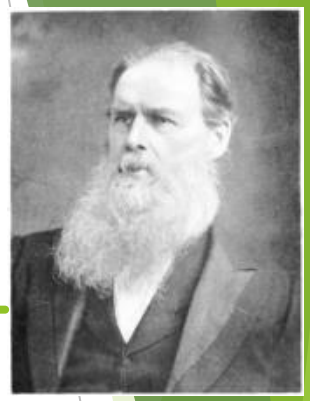
# … "sharing"

- Definitions of culture often claim that "culture is shared." But, sharing *per se* is neither an adequate nor a good criterion for several reasons:
  1. Defining culture simply in terms of sharing – like a disease that has some distribution among individuals within a society – fails to capture the essential notion that culture is ***passed on*** among individuals, rather than privately invented anew by each person.
  2. Sharing is always a matter of degree, and in two senses:
     a. How similar must the 'shared' beliefs or practices be across individuals?
     b. How many individuals in the society, what proportion, must have some facsimile of the 'shared' belief or practice?
  3. "Cultures" are not monolithic entities … culture traits and complexes have quasi-independent distributions.
- In short, "cultural" beliefs, values, practices must be shared (to some extent), but such sharing is a consequence of more fundamental criteria. And, these begin with "culture is learned" (not innate) and specify what kinds of learning are involved in the transmission and maintenance of social traditions.

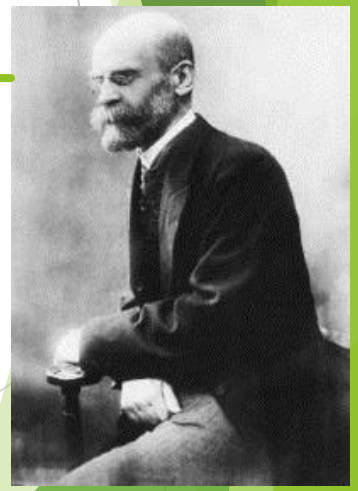
# Criteria for “culture”

The really important ones.

# The most fundamental criteria



1. **SOCIAL TRANSMISSION** –
   Cultural beliefs, values, practices, ways of doing things must be learned from and/or subsequently transmitted to other members of the society, i.e., "acquired by man as a member of society" (Tylor 1871).
   *Culture is a game of tag.*
2. **NORMATIVE FORCE** –
   Cultural beliefs, values, practices, etc., must have some degree of normative force, such that they are regarded as correct or at least better than alternatives, i.e., social facts are external to the individual and coercive (Durkheim 1895).
   *Culture implies mutual correction.*



Together, these criteria distinguish cultures as social traditions sustained by people interacting with one another (as super-individual phenomena), not simply the "sum total" of what collections of individuals privately think, do, and prefer.

NOTE: There are other important characteristics of cultures – e.g., integration-pattern-systematicity – but those are not directly relevant to my points concerning group-group differences.

# … complications

- **Social transmission** … more complicated than it may sound.
  - Explicitly taught stuff … teacher/student, master/apprentice
  - Learning from others through imitation … consciously or unconsciously
  - Figuring stuff out "for oneself" but constrained by the problem-context … where the problem itself arises only in some "cultural circumstances" and the sense of problem (rather than its solutions) is what is learned from others (famous example = 'carpentered world' hypothesis)
- **Mutual correction / sanctioning** … also more complicated.
  - "Norms" are not necessarily agreed upon by everyone … competing/conflicting norms are rather common
  - "Rules for breaking rules" … (a) exceptional circumstances change the norms (e.g., car caves following snow storms, rolling stops at stop signs), AND … (b) we routinely evaluate the 'goodness' of non-normative behaviors (e.g., well-done bank robbing vs. inept bank robbing, well-conceived and executed terrorists attacks vs. bungled terrorist attempts)
  - Degree to which people "mutually correct" one another for "violations" is quite variable

# EXAMPLES … involving problem-solving situations

Diffusion vs. Independent Invention

… social transmission? … normative force?

# Problems constrain solutions

- When people pursue similar goals with similar means, it is reasonable to suppose that the constraints of the problem exert pressures toward conformity and response homogeneity. This is a major aspect of Goldenweiser's (1913) "***principle of limited possibilities***." In extreme cases, conformity among problem-solvers is guaranteed because some problems have unique solutions.
- For example, the following code-breaking problem has a unique solution, and anyone who solves it must use similar reasoning processes:

```
   D O N A L D
+  G E R A L D
----------------
   R O B E R T
```

Each letter represents a different integer between 0 and 9, and D = 5.
[ see Handout for an illustrative solution ]

F. Bartlett's example, cited in Gladwin (1970:226-227)

- Few natural situations, however, exert such stringent constraints, with the consequence being that variability is quite common in problem-solving situations. Most times, "there is more than one way to skin a cat."

# Example 1: deciding where to fish

- **SITUATION:** *Sometimes a problem permits several functionally equivalent solutions.*
  - *If the alternatives do not differ in terms of their costs or pre-requisite resources, then individual preferences should be subject to rather free variation.*
  - *Alternatively, if the alternatives entail different resources (such as learned skills or financial costs), then these resource pre-requisites are likely to explain individual preferences.*

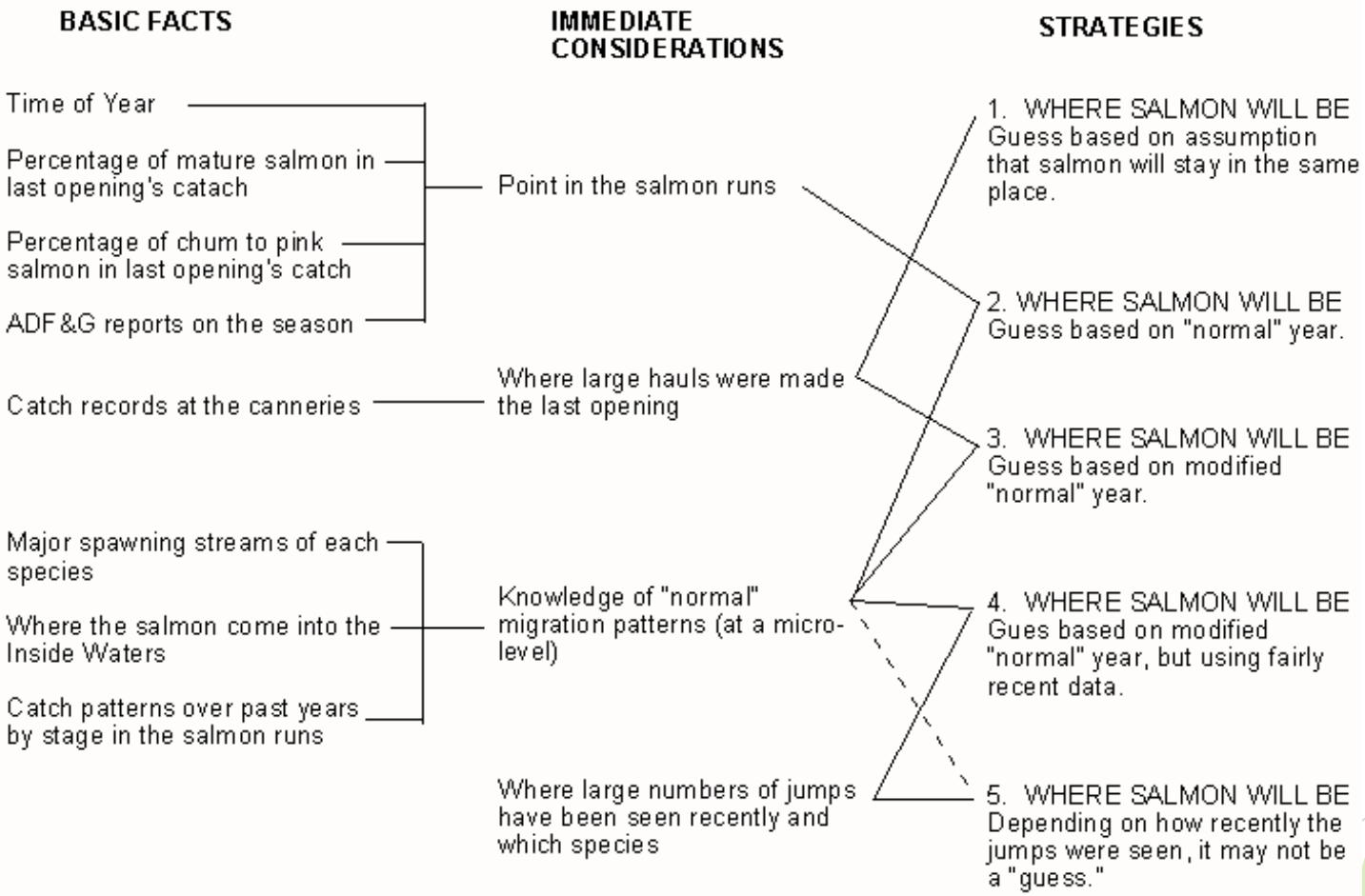
- To illustrate this first kind of problem-solving situation, I'll use one of the most psychologically intense and recurrent problems facing skippers of commercial fishing boats: ***deciding where to fish***.

Southeast Alaskan
salmon purse seining

- In Alaskan salmon seining , the "decide where to fish" problem breaks down into several sub-problems. Upon hearing of an upcoming opening (legal fishing time), the first thing skippers do is try to evaluate the open areas in terms of several considerations (Gatewood 1983).
- One of the more important of these is ***how many salmon will be in each area when the opening begins***. So, how do skippers estimate the location of moving salmon several days into the future?
- Skippers do not handle this problem the same way. Not only do they come up with different answers to the same question, but there are ***at least five strategies*** used to solve the problem, and each one uses different sorts of information.

- FIRST METHOD:
  After each opening, a skipper finds out where the big catches were made, then simply goes there the next opening. (Generally considered a poor strategy.)
- SECOND METHOD:
  Presumes salmon movements follow a stable, “normal” year; hence, if one can ascertain the current point in the salmon runs, then can predict where fish might be several days into the future. ( IF the salmon runs developed the same way each year and IF skippers had perfect knowledge of salmon migratory patterns, this would work, but neither supposition is true. )
- THIRD, FOURTH, and FIFTH METHODS:
  These are similar in that they exploit a skipper’s understanding of salmon migratory patterns at a very fine-grained level in conjunction with recently updated information concerning salmon whereabouts to predict the location of moving salmon several days into the future.
  The three strategies differ in the quality of their initial state data (how recently salmon have been observed) from which predictions are made.

Figure 1. Five Ways of Estimating Where Salmon Will Be



**SOME (INTERIM) POINTS:**

1. ***Skippers not only differ in their estimations, but in how they estimate***, i.e., there is variability at the level of strategies.
2. Strategies differ in terms of both the general knowledge and the specific information that are ***pre-requisite*** to their implementation.
    - The FIRST and FIFTH methods do not require some prior knowledge of salmon migration patterns; hence, a novice skipper could use either of these, but not the second, third, or fourth. By contrast, experienced skippers could us any or all of the five procedures.
3. This particular estimation problem has given rise to two kinds of variability: ***inter-individual differences*** (associated with a novice to expert gradient) and ***cognitive pluralism*** (expert skippers can and do employ several of the strategies when evaluating areas open to fishing).

< continuing on… >

- The THIRD, FOURTH, and FIFTH strategies all require information concerning recent salmon whereabouts, i.e., each of these "scouting" tactics predicts movements from ***fluctuating*** initial conditions.
- Getting such information presents a second problem, and again, there are several functionally equivalent solutions (Gatewood 1984):
  1. Cooperate with one's competitors in a temporary information-sharing clique.
  2. Get information from friends who troll for salmon (trollers catch different species; hence, non-competitors).
  3. Hang out at the local ADF&G office the days before an opening and smooze with the officials there.
  4. Use a seaplane to scout areas from the air.

- Preferences among the four “scouting” (information-gathering) tactics are related to the social capital pre-requisites or costs of each.
- The few skippers who opt to use seaplanes are pretty much excluding the other options  (can’t be in two places at the same time), but well-connected local skippers can use the first three tactics in conjunction.
- Thus, both inter-individual differences and cognitive pluralism are evident in the ways skippers try to obtain recent information on salmon whereabouts.

# … summary

- Even in situations where people from similar backgrounds are trying to solve the same problem we find limited variability rather than homogeneity. And, the variability is at the level of strategies for solving the problem (not just differences with respect to specific evaluations or behavioral choices).

- **THE "CULTURE" QUESTION:**

  Are the different ways of deciding where salmon will be indicative of different ***(sub)cultures*** ? – or, are they merely differing ways of thinking through the problem that individuals, as such, have developed on their own?

  … Are the strategies SOCIALLY TRANSMITTED ?

  … Do the strategies have NORMATIVE FORCE ?

# Example 2: hard work vs. patience

- **SITUATION:** *Sometimes a problem presents a dilemma, i.e., it has no known solution and yet decisions must be made.*
  - *In such cases, although the sense of problem may loom large and cause considerable angst, the problem per se exerts little constraining influence on subsequent decisions and behaviors.*

- To illustrate this second kind of problem-solving situation, I'll use a difference of opinion among Nova Scotian herring seiners concerning: ***what is the smallest school of herring worth going for?***

Nova Scotian
herring purse seining

- Using electronic “fish finders,” Nova Scotian skippers can estimate fairly accurately the size of a herring school in the water.
- Given that once the net is cast, the boat is committed to an hour or two of work and cannot go chasing after other schools that may appear on the scope, ***what is the smallest school of herring that one should mess with***?
  - Some skippers champion a **“hard work”** answer to this question. Thus, they have low thresholds and will set their nets on schools as small as 10 tons. Because there are relatively many small herring schools, the hard-work, low-threshold-strategy advocates stay busy most of the time.
  - Other skippers champion **“patience”** as the essence of successful fishing. Thus, they cruise around patiently until a large school (e.g., 50 tons) comes in sight and then cast their nets.

- Computer simulations show that each distribution of herring schools has a single optimum THRESHOLD STRATEGY (Gatewood and Mace 1990).
- But, in the naturally-occurring context of herring fishing, there is no way to determine which threshold strategy actually works best.
  - In historical catch records, THRESHOLD STRATEGY is hopelessly confounded with other explanations for differential catch, such as FISHING LOCATION, SKILL at working one's gear, and LUCK.
- Thus, while skippers are aware that boats catch different amounts of fish and that other skippers have different threshold strategies, opinions concerning the "best" threshold remain diverse and rather fixed, ranging from 10 to 70 tons.

# … summary

- In Nova Scotian herring fishing, the diversity of opinions concerning THRESHOLD STRATEGY is a by-product of there being no realistic way to determine which actually works best. Thus, opinions concerning the "best way to fish" differ markedly, and these differences of opinion persist.

- **THE "CULTURE" QUESTION:**

  Are the different threshold strategies indicative of different ***(sub)cultures*** ? – or, are they merely differing ways of thinking through the problem that individuals, as such, have developed on their own?

  … Are the strategies SOCIALLY TRANSMITTED ?

  … Do the strategies have NORMATIVE FORCE ?

# Ending
(not a real conclusion)

# So, here's a hypothetical situation for you to consider…

- Suppose a cognitive task has two possible solutions: A or B. The task is given to 100 randomly selected individuals from each of two groups, and the results are as follows:

| | Solution A | Solution B |
|---|---|---|
| Bongo-Bongo | 40 | 60 |
| Glick-Glick | 70 | 30 |

- **QUESTION FOR THE AUDIENCE:**
  ***Does the above group-group contrast demonstrate that culture influences cognition? … Why or why not?***

- - - Thank you - - -

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