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Abstract

A paradigm case formulation of technology is developed to provide a conceptual framework for addressing the process of culture change. The Descriptive Psychology approach to the concept of culture is reviewed followed by a conceptualization of the transfer of technology across cultures. The Technology Transfer Model illustrates the potential for Descriptive Psychology to aid in developing effective social policy using the general criterion of behavior potential as a choice principle.

Technology Transfer and Culture Change

Three anecdotes will serve to introduce the subject matter of this paper. The first concerns a recording made in 1939 of the Verdi "Requiem Mass" in which the tenor solos are performed by one of the most acclaimed singers of the twentieth century, Beniamino Gigli. The interesting thing about the performance is the lavish use Gigli makes of portamento, a musical ornamentation in which one note is carried to another by a slight scooping effect. Hearing the recording today, one is struck by how dated the performance seems and, at first, one is inclined to blame it on the outmoded recording equipment. Further observation, however, leads directly to Gigli's choice of style as the source of the impression. Not only is his rendition out of fashion, the quality of his performance is difficult to evaluate because the difference in standards between then and now has grown slowly and subtly enough to take us by surprise.

The second anecdote concerns a recent event in Kodiak, Alaska, reported in the Kadiak Times, June 13, 1985. United States Fish and Wildlife agents confiscated from local shops a variety of handicrafts fashioned out of sea otter by Marina Katelnikoff, an Alaska Native. The items were said to violate an exemption to the Marine Mammal Protection Act of 1972 which allows Alaska Natives to make and sell handicrafts from the hides of marine mammals. The federal agents questioned "if some of

Katelnikoff's items fall in the category of 'traditional Native handicrafts.'" A Fish and Wildlife spokesman stated: "Any items determined traditional items of authentic Native handicraft or clothing will be returned to Marina or the shops they were seized from."

The third anecdote comes from the lower Kuskokwim River in South Western Alaska sometime during the mid-1970s. A young Eskimo boy had to be flown from his home village to the Public Health Service Hospital in Bethel for extensive repairs to his broken jaw. He had been kicked in the face during school recess by another boy who had seen television for the first time in that village the night before. One of the inaugural programs aired by this newly arrived technology was "Kung Fu", a series remembered by some of us for its fascinating mixture of mystic spirituality and vengeful violence.

These anecdotes introduce three interrelated aspects of the general subject matter of culture: 1) culture change, 2) culture contact, and 3) technology. The first anecdote reminds us that, aware of change or not, part of the concept of culture is that change is always happening. The second anecdote illustrates that cultures in contact with one another can, and usually do face problems associated with conflicting social practices. The third anecdote introduces a third fact that a technology transferred

from one culture to another can initiate a host of difficulties in the midst of its intended benefits.

What makes these aspects of culture relevant to Descriptive Psychology is that they all happen on purpose, i.e., they all involve the intentional actions of persons. There is a paradox, however, that despite the logical necessity of intentional action as the basis both of technology and its role in culture change, it never seems possible to trace particular outcomes to particular actors. Given this paradox, it seems reasonable for the study of culture change to have fallen typically under the domain of sociology, economics, or other social sciences dealing with large-scale social processes. As long as these processes involve the behavior of persons, however, no attempt at their explication can be complete without thorough psychological description. The resources of Descriptive Psychology are rich enough to make intelligible the role persons play in the relationship between technology transfer and culture change.

Building as much as possible on formulations about culture already developed in the Descriptive Psychology literature, this paper seeks to extend those formulations into the analysis of technology, specifically the transfer of technology across cultures. The analysis will try to accomplish three main goals: 1) to bring to light features of the concept of technology involved in its transfer across cultures, 2) to provide a basis

for future analyses of the wider process of culture change, and 3) to demonstrate possibilities for the effective use of Descriptive Psychology in the development of social policy.

The remainder of the paper is in three main sections. The first section is a review of the concept of culture as developed in Descriptive Psychology. The second is a conceptualization of the technology transfer model and its relationship to culture change. The third section is a discussion of culture change and the use of Descriptive Psychology in developing social policy.

The Concept of Culture

There is now a sizeable body of contributions devoted to the concept of culture within the larger literature of Descriptive Psychology. A general formulation of the concept was first presented by Ossorio (1983). Major elaborations and applications of the culture concept were offered at the same time (Aylesworth & Ossorio, 1983; Silva, 1983; and Torres, 1983), mostly dealing with problems of individuals meeting their needs in new and unfamiliar cultural settings. Orvik (1985) used the concept of culture in a discussion of the concept of migration.

Other works in Descriptive Psychology are related closely enough to the concept of culture to warrant mention here. In his development of the community concept, Putman (1981) outlined the main parameters from which Ossorio (1983) was able to generate the full conceptualization of culture. Lasater (1983) developed

a framework for studying stress and health in a small community that would be entirely compatible with a culture-sized application of his model.

Ossorio's parametric analysis of culture (Ossorio, 1983) provides direct access to how one culture is the same as or different from another. Formula One is a list of these parameters.

Formula One:

Cu = M, W, S, L, SP, CP , where

CU = Culture

M = Members

W = World

S = Statuses

L = Language

SP = Social Practices

CP = Choice Principles (Ossorio, 1983, p. 31)

Each of these parameters is discussed at length in the original article and so need not be repeated here. For the present paper, because this formula serves to differentiate one culture from another, it can also serve to differentiate a single culture at two points in time. That is, the above conceptualization provides a way to account for culture change, a

matter of great importance in the conceptualization of the role technology can play in bringing culture change to pass.

The Cross-Cultural Transfer of Technology

This section outlines the concept of technology and the part it can play in culture change. Of particular interest are cases of culture change associated with the cross-cultural transfer of technology. The concepts presented here grew out of a need to comprehend the complex array of forces, mostly social forces it turns out, influencing the rapid deployment of high level telecommunications technology among the cultures of rural Alaska. These developments came about to solve a wide range of economic, educational, and social problems endemic to that environment (Orvik, 1987; Pittman & Orvik, 1977; Hills, 1981). How well these problems have been addressed stimulated the conceptualization of the models on which the present analysis is based.

That the transfer of technology across cultural boundaries can lead to rapid culture change needs little documentation added to that already in existence. The literature on modernization alone (e.g., Kahl, 1968; Smith & Inkeles, 1966; Doob, 1967; Dawson, 1969) fills many volumes. Very little has been done to develop a comprehensive conceptualization of why technology gets transferred, and yet such a package would go a long way toward

helping us understand the difference between technology transfer going right and technology transfer going wrong.

What is described here is a model for identifying the key components of technology transfer. The model consists of a number of subsystems, each of which plays an important role in the overall process. The concept of technology itself, being directly linked to how persons meet their Basic Human Needs, should be discussed before the various subsystems are outlined.

Dictionary definitions of technology are of little value because they are noncommittal as to the role technology plays in human life. For example, the Random House Dictionary of the English Language defines technology as "the branch of knowledge that deals with industrial arts, applied science, engineering, etc.", or as "the application of knowledge for practical ends, as in a particular field" such as educational technology.

Oswalt, an anthropologist, defines technology as "all the ways in which people produce artifacts" (1976, p. 33). While this definition is at least more inclusive than Random House's, it makes no more conceptual headway inasmuch as it seems to exclude the artifacts themselves as the primary focus. In fairness to Oswalt, it should be pointed out that the focus of his work is on the artifacts themselves as a record of the technological complexity of the world's various cultural systems.

The problem is not so much with the definitions themselves as with the fact that the utility of definitions is inherently limited to what we already know that can be appealed to for recognition (Ossorio, 1981). What is needed is an articulation of the concept that specifies the characteristics of an unambiguous, or paradigm case of technology. The formulation of the paradigm case can then be used as a standard for generating related cases on the basis of how they differ from the paradigm.

A paradigm case formulation (PCF), while different from a parametric analysis (e.g., Formula One), serves much the same purpose: to generate a range of possibilities in a domain. A parametric analysis does this by reference to the dimensions (parameters) of a domain, each dimension hosting a range of possible values. One case can be distinguished from another in terms of the different values these parameters assume. A PCF accomplishes the explication of a domain by designating some portion of its cases for attention and then showing how the rest of the cases relate to it. The procedure involves two steps (Ossorio, 1981):

1. introduce a paradigm case, one that is clear-cut and recognizable by anyone who knows the concept;
2. introduce one or more transformations of the paradigm case.

The advantage of both a parametric analysis and a paradigm case formulation over a definition is that the latter cannot explicate different cases within a domain unless something like parameters and transformations are invoked.

Definition One:

As a point of origin, technology is defined as the production and use of an artifact for the improvement of a person's own circumstances.

The first characteristic, production, tells us that technology is not a natural but a human phenomenon. It has to be invented, adapted, conceived of, etc. Production can also include distribution, promotion, or authorization of a technology.

The second characteristic, use, suggests the purposeful nature of technology in the sense that a technology that is not used is a defective case.

That it consists of artifacts is to place technology in the social practices (SP) parameter of culture in a part/whole relationship between the physical implements used in a behavior and the behavior itself.

Characteristic number four, improvement, opens up the possibility that technology can go wrong by failing to improve someone's circumstances.

With the fifth characteristic, a person's own circumstances, it is pointed out that in the paradigm case all five characteristics are actualized in the same person. The fifth characteristic also allows us to generate cases where other persons and their circumstances are the reason a technology gets produced or used.

From Definition One and its related discussion, we have the following Paradigm Case Formulation (PCF 1):

1. Paradigm Case: A person invents tool X and uses it to get work done faster.
2. Transformations:
   - T1. Separate the producer from the consumer:
     The person invents tool X but does not use it, or
     the person uses tool X but does not invent it.
   - T2. Introduce the status of entrepreneur:
     The person develops a market for tool X and distributes it to persons interested in getting their work done faster.
   - T3. Separate the consumer from the beneficiary:
     The person uses tool X to get someone else's work done faster.
   - T4. Introduce the possibility of the technology going wrong:
     Tool X breaks down, or

Tool X injures someone, or

Tool X does less well than expected.

T5. Replicate the process in another context of use:

A member of another community sees tool X and reenacts T1 - T4.

A member of another community sees tool X as a way of getting things done not thought of before.

As will be made clear shortly, derivative cases encompassing the cross-cultural transfer of technology can be generated by reference mainly to the production and use patterns of a technology, i.e., T5 of PCF 1. For a complete understanding of the entire process, however, the remaining components of the Technology Transfer Model need to be described.

The Technology Transfer Model

The components of the model for evaluating the transfer of technology across cultures are organized into three interrelated systems: (1) the Consumer system, (2) the Influence system, and (3) the State of Affairs system. Each of these systems has a place in the evaluation of the role technology transfer plays in bringing about culture change.

The Consumer System

The consumer system describes what kinds of consumers of technology are possible. In the paradigm case of technology a person uses a particular version to improve his or her own

circumstances in some specific way. The ways in which technology can improve someone's circumstances typically fall into three empirical categories:

(1) entertainment -- where technology is used (a) to initiate or maintain a positive mood, or (b) terminate a negative one, e.g., watching television;

(2) profit -- where technology is used to acquire means of exchange (other than by selling the technology) e.g., using telecommunications for obtaining market information;

(3) convenience -- where technology is used to make a social practice a more efficient way of meeting a need, e.g., hunting with a bow and arrow as an adjunct to running the animal down.

In the present model it is worth distinguishing among different kinds of consumption. Primary consumption is the use of a technology for one's own entertainment, profit, or convenience. Primary consumption is the paradigm case of technology use.

Secondary consumption is where technology is used for someone else's entertainment, profit, or convenience. This case of technology use is distinguished from the paradigm case by the logical necessity of another person or persons being involved. The relationship is built into the configuration of the

technology itself. For example, if a teacher in a remote site takes an advanced course in cultural relations via satellite telecommunications, the students that will be taught better are conceptually part of the reason the technology exists. The teacher is a secondary consumer in this case, even though there may be an additional reason, such as a pay increase, for the decision to participate.

The third kind of technology use is called tertiary consumption. Tertiary consumption refers to the effects on a person of someone else's use of technology. There are logically two types of tertiary consumers: those affected by someone's primary consumption, and those affected by someone's secondary consumption to technology. An example of the former would be the only child on the block without a television set. Such a child would be restricted from participation in whichever social practices involve acting upon what happened in prime time the night before. The incident involving the injured Eskimo boy, related at the beginning of the paper, is an example of tertiary consumption stemming from primary consumption.

Tertiary consumption involving the secondary use of technology has already been illustrated in the education example above. A slightly different version of the concept is exemplified in virtually all the world's weapons of war. Ironically, the successful use of weapons technology is the only

case I can think of where the tertiary consumer is intentionally less well off in the sense of paradigm characteristic number four, Improvement.

It is not always possible to place the use of a technology cleanly into one class or the other. Some situations may have features of all of them. The important thing is that the use of technology can, and usually does, represent a complex configuration of social relationships, personal characteristics, and coordinated activities, not all of which can be foreseen much less anticipated. The more that can be anticipated, however, the greater the chance that technology use of any kind will lead to increased behavior potential rather than unanticipated ill effects. The next section describes the system of influences that control the technology of a given place.

The Influence System

Underlying the description of the Influence system is the reminder that the form a technology takes is under the control of persons engaging in deliberate action. Thus we can view technology as a psychological process, accomplished by choice within the entire social system that calls for it, rather than by accident or act of superhuman agency, outside the system of ordinary means by which persons meet their Basic Human Needs.

There are three components to the Influence system, each of which has two facets. The three components are: (1) the Motivation component, (2) the Authority component, and (3) the Competence component.

Motivation. The Motivation component of the influence system comprises all the reasons someone wants to influence a particular technology. These reasons fall generally into two main classes of motivation: (1) Virtual -- reasons to influence a technology based on its virtues for improving the consumer's circumstances, and (2) Fiscal -- reasons to influence a technology based on the benefits that derive from some aspect of the production of the technology.

Examples of virtual motivation are easily generated. Any technology that has ever been used for someone's entertainment, profit, or convenience, from the first arrow to the latest computer, could serve as an illustration.

Fiscal motivation, on the other hand, is exemplified in cases where the course of a technology is influenced for reasons other than what it was designed to do. The electronic engineer working in "Silicon Valley", is fiscally motivated who, in response to a request for bids issued by the Alaska Office of Telecommunications, designs a piece of electronic equipment to translate satellite TV signals beamed to an earth station in a remote Alaska village for the viewing pleasure of its citizens.

The employee who wrote that request for bids was fiscally motivated to influence the technology of the remote village by an anticipated improvement in his annual performance rating. I am expressing my fiscal motivation to influence the village's technology, a technology I probably will never consume, by presenting the concept of fiscal motivation in this volume.

The purpose in making the distinction between virtual and fiscal motivation is so their relative influence over the social practices causing a culture's technology can be analyzed effectively. Two important questions arise in this regard. One is, how much of each kind of motivation is operating in a particular context? Another is, what conditions determine the degree to which one kind of motivation preempts the other, and what are the consequences? As will be seen in the next two sections, these kinds of questions recur in each part of the model.

Before moving on to the Authority component, however, it is worth pointing out that the two kinds of motivation discussed here correspond to distinct roles played by those who assert power over technology. Virtual motivation logically applies to consumers, specifically to primary and secondary consumers. When virtual motivation is the basis for action, achievement is impossible any time prior to the activation of the technology. Fiscal motivation applies to those occupying entrepreneurial

roles, that is, in the design, production, or distribution of the technology. When fiscal motivation is the basis for action, achievement is possible at any time in the process of technological development. In other words, when one is analyzing the relative influence of virtual and fiscal motivation, one is also analyzing the relative operation of consumer and entrepreneurial interests in the matter. The timing of who gets paid when is central to the analysis. A related point is that what are normally accounted for as the costs of developing a technology can now be seen for what they are -- forms of fiscal motivation for anyone to respond to who has the requisite status and personal characteristics outlined in the next two sections.

Authority. The Authority component of the Influence system refers to positions in a social structure persons can occupy to influence technology. As with the Motivation component, there are two kinds of authority a person can have: (1) Formal authority -- the formal authority to influence technology associated with a particular social role, and (2) Informal authority -- the authority to influence technology created through face-to-face interaction in a particular context.

Formal authority is the more easily exemplified of the two kinds. Legislators who appropriate funds to extend entertainment television to rural Alaska, boards of directors who authorize stock purchases in computer firms, Supreme Court justices who

rule on the patenting of recombined genes, are straightforward examples of formal authority to influence technology.

Informal authority, on the other hand, is easier to describe than to exemplify. An analogy will help outline its features. Gearing et al. (1979) made a useful observation to the effect that in any society the distribution of knowledge, skill, and talent is not random among its members. Rather, these powers are distributed throughout the social structure by the process of face-to-face interaction. Analogously, the implementation of a technology in any context is subject, at least in part, to how much utility and value is attributed to it through the same process -- face-to-face interaction. In other words, informal authority exists to the extent that a technology's virtue is not entirely intrinsic but dependent also on socially negotiated judgments for its adoption and survival in a particular context of use.

If the concept of informal authority seems elusive, the reason may be that it is elusive. Because the concept has not been articulated does not mean that its influence is weak, however. The dropping of America's commitment to enter the supersonic transport development race was a response to informal authority, albeit exercised through formal authority systems. Shows of public resistance to the development of our domestic

nuclear power industry are further indicators of the informal authority system.

In fact, one index of the magnitude of the amount of informal authority over a technology is the amount of effort required to resist it. The advertising industry, for example, exists almost entirely in tribute to the informal authority of the populace to hold thumbs up or down regarding even the most virtuous of technological developments.

In any case, the process of innovation is complex and, as pointed out articulately by Katz (1973), it will not submit easily to analysis that ignores the role of informal elements. He notes that attempts to relate adoption of new items to attributes of the item, the social structure, the culture, etc., usually fall short conceptually, especially if they fail to consider the compatibility of the item with informal aspects of the entire context of its use.

Competence. The third component of the Influence system is the competence component. As with the other parts of the Influence system, the competence to influence technology has two forms: (1) Technical competence -- what skills and knowledge are needed in order to actualize a technology in a particular context, and (2) Cultural competence -- knowledge of the social practices resident in a context where the technology is to be used.

The requirement of technical competence is easy to understand; no technology can come into being without it. Technical competence refers to all aspects of a technology; not just to its design and production, but to its distribution and consumption as well. Because technical competence can range from high to low, so also can the quality of the technology, and by extension, its capacity to improve someone's circumstances.

Cultural competence, understanding the social practices of a culture at risk to the transfer of a technology, is typically preempted or overlooked as a source of influence. Yet, cultural competence is what is needed to anticipate (a) the extent to which a technology fits into the social practices of a culture in a particular case, and (b) the extent to which it will improve its members' prospects for meeting their Basic Human Needs.

Anyone who watches television without being able to build a television set enacts the distinction between technical and cultural competence. The converse is true as well: anyone whose invention has been put to an unforeseen use exemplifies the distinction. The inventor of chicken wire (now advertised as poultry mesh) probably did not anticipate that villagers in Southwestern Alaska would see in it an ideal material from which to make fish traps. Other examples of unforeseen uses of inventions, from trivial to monumental, could be presented. The point is that the probability of such a use taking place is

limited by the degree to which technical and cultural competence are simultaneously at work in the same locale. Moreover, to the extent technical competence is segregated from and allowed to preempt cultural competence, there is a likelihood that the technology transferred to a given context will be misdesigned in some important way. The same holds true for situations where fiscal preempts virtual motivation, and where formal authority preempts informal authority.

The next part elaborates the concepts by which the parameters of the Influence system can be related to states of affairs their interactions produce.

The State of Affairs System

If the process of innovation were without problems, if transferred technology never want wrong, if new social practices always led to more behavior potential for everyone, there would be little need to monitor the states of affairs the cross-cultural transfer of technology can bring about. What is needed is a way of describing states of affairs that is sensitive to the difference between innovations that go right and those that go wrong. For discursive purposes, the States of Affairs outlined here comprise an evaluation of technological innovation. There are direct applications, however, to evaluating any aspect of one culture (it's World, Statuses, Choice Principles, etc., from Formula One) when transferred to another culture. What comes to

mind is the delivery of such things as educational, medical, or social services; economic and legal procedures, etc. For the current model, what holds true for technology developed in one cultural setting and used in another also holds true for anything developed in one cultural setting and used in another.

A great deal of attention is being paid, for example, to the use of Western models of psychotherapy and counselling in non-Western cultures (Draguns, 1973; Torrey, 1972; Marsella & Pedersen, 1981; Silva, 1983; Torres, 1983; Marsella & White, 1984). Indigenous subsistence systems being replaced by Western corporate investment structures mandated under the 1971 Alaska Native Claims Settlement Act is another example.

The evaluation of a technology (or other innovation) in a new context can be accomplished by a slight variation on the theme of supply and demand. This abstraction works if a concept of demand is used that ties it to the idea of Basic Human Need, and a concept of supply is used that includes the use of technology to meet those needs.

The conceptual outline of the State of Affairs system is quite simple. It consists of only two intersecting dimensions representing the transfer of a technology in a new setting, on one axis, and the need for it in that setting, on the other. These elements are arranged in the four-fold matrix shown in Table 1. The cells of this matrix represent four

distinguishable states of affairs: Responsive, Wasteful, Deprived, and Stable.

Insert Table 1 about here

Responsive states of affairs. Responsive states of affairs are those in which the demands for a technology in one cultural setting are met by its being transferred from another cultural setting. The "snowmobile revolution" in Arctic Scandinavia (Pelto, 1973) is a good example of a responsive state of affairs. In this instance, an old need was met by a new invention. Reindeer herding among the Sami predated the existence of snowmobiles by many generations, as did the need for continuously more convenient and profitable ways to herd the reindeer. When snowmobiles were invented and became available for transfer, they became an innovation.

This is not to say, however, that a responsive state of affairs is free of problems. For example, one effect of the use of snowmachines was to "de-domesticate" the herds:

> In effect, the animals have been allowed to return to a near-wild stage. Relinquishing control over the animals represents the continuation of a trend that was already

> evident before the coming of the snowmobile. The use of snowmobiles pushed the de-domestication process to its logical, and possibly irreversible limits. (Pelto, 1973, pp. 98-99)

There are other examples in Pelto's analysis that serve as reminders of the systematic interactions among the parts of a context of technology use. In the present model, culture change occurring in responsive states of affairs need not always be positive. Where problems arise, however, they arise logically in the area of Tertiary consumption associated with Primary consumption of the demanded technology.

Wasteful states of affairs. The next cell of the States of Affairs System comprises situations where technology is transferred without it having been demanded. At first glance, this state of affairs may seem merely hypothetical, especially on a scale of any important size. We may all have purchased some gadget or other that now gathers dust in a closet, or have given a toy to a child only to have it appear at our garage sale advertised as "never used -- only thrown down once."

Ironically, it was the nagging underconsumption of telecommunications technology by rural Alaskans after it has been put in place at great cost that prompted the present

conceptualization. How could that have happened? It is argued here that the magnitude of the waste is a joint function of (a) the amount of fiscal motivation made available to (b) persons with technical competence in excess of their cultural competence by (c) persons with formal authority ignorant of the informal authority indigenous to the context of use.

Deprived states of affairs. With appropriate modifications, the above argument holds for the next cell of the matrix, the deprived state of affairs. In this state of affairs, there is a need that could be met by some existing technology, but that technology is not supplied. Many of the differences between Third-World and Western nations could be thought of as deprived states of affairs. When, for example, Western medical technology exists but, for all the reasons implied in the Influence system, does not get transferred to cultures that would benefit from it, those cultures are in a deprived state of affairs.

There is, of course, an ex post facto character to deprived states of affairs insofar as they can only occur after a technology gets invented; only then could a gap occur. All that is really being described, however, is a conceptual part of the uneven distribution of Basic Human Need satisfaction susceptible to the possible transfer of technology across culture boundaries. The significance of this condition is that a deprived state of affairs logically includes reason enough to do

something about it. What gets done about it is under control of the Influence parameters described earlier.

Stable states of affairs. The fourth state of affairs in the model exists when there is little demand for new technology and little external pressure to adopt it. This is termed the stable state of affairs in the present conceptualization, implying a high level of Basic Human Need satisfaction within the target culture so that little reason exists to change its basic character, introduce new social practices, or generally put a high value on innovation.

How stable any context ought to be cannot be decided in advance. Postman (1979) has gone so far as to suggest that a culture can "OD on stability", by being too rigid to respond to changes in circumstances. As will be discussed in the next section, the argument rests on something more than the issue of flexibility versus rigidity. Rather, the metric for gauging the rate of change consists of an appraisal of how members of the described culture are better or worse off. To the extent this can be done in advance of the technology transfer, everyone, save the fiscally motivated, is better off. The point of introducing the concept here is to remind us that stability is a possible state of affairs, possibly a desirable one, and one that could possibly go wrong relative to whatever standards we have for making that kind of observation.

The Development of Social Policy

The four possible states of affairs just described provide formal criteria for evaluating the course of culture change wrought by particular instances of technology transfer. How technology transfer causes culture change is, however, only one issue within the context of the larger problem of how to keep technology transfer, and, equivalently, culture change from going wrong. The issue, then, is one of social policy and how best to develop it. To pursue this issue further, there are several observations about technology and culture change worth discussing.

First, the relationship between technology transfer and culture change is a special case of the relationship between technology and culture. Both relationships are part/whole relationships in that no technology, transferred or otherwise, exists conceptually apart from the set of social practices in which it has a place. Transferred technologies are not different from new technologies inasmuch as the social practices in which they have a place are necessarily changed by their introduction. In short, that changes will occur, and that the changes will be in a culture's social practices is a logical part of the concept of technology.

Second, it may seem too obvious to need pointing out, but culture change is a universal state of affairs with no exceptions. This is not an empirical statement but a conceptual one. A static model of culture, even for the purpose of describing how a culture has changed, is a researcher's convenience. The anecdote about Gigli's portamento related at the beginning of this paper is a reminder of how fine-grained the description of culture change can be. Apropos the paper's main theme, it is only through the prior introduction of a new technology, analog sound recording in this case, that it is now possible for an observer, not even alive at the time of the original recording, to detect such a change in our culture without the necessity of historically continuous face-to-face observation.

Third, there is the question of authenticity of culture expressions (Orvik & Towarak, 1982). How do we really know that this artifact, symbol, song, etc., came from culture X? One answer is that a member of culture X produced it; it passed a blood test, so to speak. This question is related to the one raised by the legal challenge to Mrs. Katelnikoff's right to sell the artifacts she creates as authentic expressions of her culture. There is a larger question involved, however, whether authenticity resides in the object or in the authentication process. Ossorio (1978) used an example that may shed some light

on the matter. We can give it the provisional title: "The picture of Uncle Joe." In this example we are asked to imagine seeing a photograph of Uncle Joe and trying to decide if it is, indeed, of Uncle Joe, or someone who just happens to look very much like him. Then we are asked to draw a picture of Uncle Joe, or whoever our "Uncle Joe" is, and try to decide the same thing, is it or isn't it? Only in the second case can there be no question, despite the fact that the resemblance of Uncle Joe is apt to be greater in the first case. So in answer to where does authenticity reside, we can see that it is a process of social negotiation that includes an appeal to the eligibility of the producer, and only secondarily an appraisal of the resemblance of the object to a formal standard. As a side note, consider what gives a case of counterfeit its significance. The eligibility of the producer obviously takes precedence over the quality of the product.

The fourth observation is that culture change does not require culture contact in order to happen. Culture contact mainly influences the values the various culture change parameters are likely to assume, but those values can come from inside as well as from outside the culture's membership. One of the distinctive features of culture as a form of human organization is that it comprises everything needed for its

members to be reared to full-fledged adults capable of meeting their Basic Human Needs (Ossorio, 1983).

That cultures change at different rates relative to one another and at different times in their history is a fact that depends on what one uses as a metric, which brings us to the fifth observation. There is no metric for gauging the rate of a culture's change independent of its effect on the behavior potential of its membership. Neither rigidity nor rapidity of culture change needs avoiding _per se_. Culture change can be too fast or too slow depending on whose circumstances are worse or improved, and in what way those states of affairs come about. To paraphrase a Descriptive Psychology Maxim: culture change goes right unless it goes wrong in one of the ways it can go wrong (Ossorio, 1981).

In the case of the injured Eskimo boy, it is tempting, indeed it has been frequent for critics to conclude that he was a victim of rapid culture change. Bodley, in his introduction of _Victims of Progress_ (1982) expresses this point of view:

> Industrial civilization is now completing its destruction of technologically simple tribal cultures. According to the viewpoint of many authorities within industrial civilization, this disappearance or drastic modification of these cultures is considered necessary for the "progress" of civilization and is thought to be inevitable, natural, and,

in the long run, beneficial for the peoples involved. (p. iv)

The absence of an intrinsic metric for gauging the rate of culture change, other than its effect on behavior potential, is an opportunity to develop new forms of appraisal, social negotiation, and control by persons over the effects of impending technology transfer. Policies reflecting Bodley's paternal preservationism as well as the exploitationism of the civilized industrialists he descries could, if implemented, be successful only by accident. The evaluation of an attempt to change an aspect of culture is analogous to evaluating the success of psychotherapy in that the results, good or ill, ultimately reside among those whose well-being is at stake. Judgment and sensitivity rendered in the context of those whose behavior potential is at risk are not incompatible with the development of effective social policy (see the "precaution paradigm" developed by Ossorio, 1981, pp. 111-116).

The final observation is that the development of social policy about the cross-cultural transfer of technology is itself a social practice. As a social practice it necessarily includes references to what is wanted, what knowledge is involved, what competence is required, what persons are eligible and/or obligated to participate, etc. Descriptive Psychology, because it is primarily concerned with formal access to these and other

related facts, is in a strong position to make systematic sense of large-scale social processes. The resulting systematic description can be used as a rational basis for social policy.

As shown in the case of technology transfer and culture change, social policy must necessarily identify what is at risk and act accordingly. At the most general and abstract level, what is at risk is the behavior potential of persons. What the above model has done is apply the concepts of Descriptive Psychology systematically to the entire range of facts the process of technology transfer entails. By redescribing the policy issue as one of lost and gained behavior potential, social policy can do what it is supposed to do, make persons better off or keep them from becoming worse off.

Threaded throughout the development of the Technology Transfer Model are opportunities for developing policies to keep the process from going wrong in some of the ways it could go wrong made obvious by the model. For example, the technology could be wasteful if there is fiscal motivation in excess of virtual motivation to transfer it. A culture could be deprived of really useful technology if the formal authority system is out of touch with the informal authority system. The eligibility to make decisions is a status assigned through social practices. When technical competence is divorced from cultural competence,

there could be an increased likelihood that innovative uses of various technologies would be overlooked.

The power of Descriptive Psychology is in its systematic efficiency for lining up the relevant facts of a matter and making obvious their significance to the persons involved. In the matter of cross-cultural transfers of technology, the scale of significance is increased in size and complexity, and the focus of significance shifts from individual persons to persons in culture. The goals of description are similar, however, despite the differences in scale and focus, namely to find alternative ways of behaving and to establish a set of principles for choosing among them. Where the scale is large, so is the significance of choices to the members of a culture most often left without influence in the process, but whose behavior potential is always at risk.

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Table 1

Possible States of Affairs for the Supply of a New Technology Relative to its Demand in a New Culture

	Demand for the Technology	
Supply of the Technology	Demanded	Not Demanded
Supplied	RESPONSIVE	WASTEFUL
Not Supplied	DEPRIVED	STABLE