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The Culture of Complementarity

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ABSTRACT

Human relations involve a balance of substitution and complementarity. In economics, substitution is stressed and complementarity ignored. An economics of substitution – of independence, scarcity and short-term material growth – will lead to alienation and disengagement. An economics of complementarity – of planning horizons, increasing returns and networks – supports a case for organizational health and social provisioning through a community process.

The institutionalist principle of circular cumulative causation (CCC) implies complementary linkages. Complementarity calls for collaboration to realize mutual gains subverted by competition. If complementarity dominates substitution in human relations – namely, if economics is about concerts and not conflicts of interest – then what are its social, institutional and cultural implications?

A culture of complementarity feels unnatural to an economist. A shift to common needs entails a large analytical leap into new realms of analysis, understanding and social design. If all well-being is social, if your benefits are aligned with mine, a lack of conflict creates community. In this setting, competitive values do not quell but cause strife and harm to health and well-being! The relations implied by complementarity favor community effort as a means to social provisioning.

This paper limns the culture of complementarity in economics. A key to achieving community (in both theory and practice) is here, replacing substitution with complementarity in our basic assumptions. To move beyond the myopic culture resulting from competition, one needs to examine a culture of complementarity as a critical step beyond disengagement toward a community-oriented process of social provisioning.

Keywords: *complementarity, cooperation, culture, planning horizons*

The Culture of Complementarity

I. Introduction

In my previous work, I have established the basis for an argument that the standard view in economics that human relations are based on conflict – on substitution and tradeoffs – is either wrong or at least too restrictive (e.g., Jennings 2014). This paper will start with a summary, in *Section II* below, of the overall case for complementarity and its relation to planning horizons and horizon effects, since the two cannot be held distinct in any generalized theory. *Section III* will follow with a discussion of the institutional implications of this difference, as a

means of framing the context of the divergent cultural aspects of substitution and complementarity. *Section IV* will limn the culture of complementarity in this setting, and describe how it differs from our rivalrous culture of substitution in its effects on health and well-being. *Section V* will address some more implications of this situation, and digress on a few ideas about cultural change and development.

II. The Case for Generalized Complementarity and Its Horizonal Aspects

Standard theory in economics supposes that almost all our relations and economic connections are based on conflict and opposition; substitution and tradeoffs are emphasized over mutual gains and complementary interdependencies. Input factors, consumer goods, individual welfare: all are rivalrous substitutes, rarely reinforcing each other (Richardson 1959, pp. 233-34; Stigler 1951, pp. 140-44; but cf. Nelson 1981, pp. 1053-55). This will be fine for beer vs. wine, water or soda when quenching a thirst, but where in this schema do pretzels, chips, cheese, crackers and parties appear? The habit of aggregating by 'industry' has some high invisible costs. There are important interdependencies that are mutually reinforcing: not in an either/or but in a both/neither relation.

We call this complementarity but tend to ignore it in our constructions. The reasons for shunning complementarity are of interest here. To summarize the argument: substitution assumptions stand on claims of decreasing returns, such that upturning marginal (and therewith average) cost curves rule as a general phenomenon in the production process. This may be so in agriculture, though history and logic question this view (Schulz 1993). But if increasing returns are the rule – despite mainstream denials thereof (Jennings 2011b) – then complementarity dominates substitution in all long-run applications, and in the short run for intangibles such as learning, culture and knowledge (Jennings 2014). The waning case for substitution stems from methodological license: competitive equilibrium models founder without this premise.

Perhaps that needs some explanation. Short-run production models encounter 'cranky' inflexible inputs: plant and equipment cannot be changed except through a long-term process. This means that to increase output above the optimal scale of production will lead to rising costs by pushing against short-term constraints. Only for longer runs can these limits be overcome by expanding output capacity, with increasing returns and lower costs. This is the reason that longer runs suggest that replication justifies constant unit costs of production as an *upper bound*, where a larger scale invites less cost through more efficient techniques. The case for long-run increasing returns seems unassailable here.

As Kaldor (1975, p. 348) explained, increasing returns imply complementarity overrules substitution as our most general form of economic connection, calling it "far more important for an understanding ... of the economy than the substitution aspect." There is no argument that, in the short run, decreasing returns prevail. But this short vs. long run difference, subject to Kaldor's endorsement of falling costs, suggests time matters a lot, especially if economic relations (the balance of substitution and complementarities) stand and turn on run length! If substitution cannot be presumed to apply across economic connections, then economic constructions shift to a new, largely-unexplored track. Complementarity opens a Pandora's Box of fundamental conundra that are neither recognized nor resolved in orthodox schemas. This is where horizonal links solve vital lacunae.

The argument can be couched only in terms of time-horizons, save that the route to a longer perspective in time is through an extension of knowledge: in order to see our results ahead, we must know all relevant causes. This is why a focus on *planning horizons* (and horizon effects) is needed to analyze run lengths in terms of our real-world decisions. Just to look at time frames sidesteps the causal links.

Without detailing the whole story of planning horizons (horizonal theory), which is adequately elaborated in many other papers (e.g., cf. Jennings 1985, 2004, 2005, 2008b, 2009, 2012ab, 2014), a brief review is in order. The central idea underlying horizonal theory and horizon effects is that every decision we make is based on imagined projections (and not known outcomes) of choosing *this* over *that*. These are assertions of causal belief, full of uncertainties, subject to error, and drawn from theories of how our world works. The actual outcomes of our actions shiver in turbulent winds of change (Emery and Trist 1965), buffeted by others' shenanigans,

wholly-unexpected developments, and events we cannot predict. The horizonal *range* of projections inheres, not in what we think or intend, but in their real embrace.[1] Surprises set the actual limit on our horizonal length.

We do not frame this in cardinal terms; we cannot count the 'wits' in a choice. But with horizons in every decision, we can address their ordinal length and how they react to change.[2] These show up in 'horizon effects,' shifts in the range of planning horizons set into our actions. Horizon effects occur in response to internal as well as external inducements, such as psychological factors, alertness, energy, wakefulness for the former and the stability of the decision environment, other relevant agents' horizons, and unexpected disasters as instances of the latter. Horizonal range is dynamic, adaptive, flexing to many adjustments.

The key point is that horizon effects shape our relations, social, personal and economic. Assuming inter-horizonal complementarity – namely that private horizon effects spread through similar social effects on neighbors' horizons – the balance of substitution and complementarity, with respect to one agent relative to a surrounding group (think of a network characterized by total interdependence here), is tipped one way or the other by those spreading horizon effects. The key insight is this: any horizonal lengthening (in time) or extension (in social space) shifts our interdependent relations in favor of complementarity and away from substitution, where retracting horizons effect the reverse.

So the nature of interdependence is horizonal in this sense. Horizon effects shape economic relations in predictable ways, tilting the balance of substitution and complementarity between interpersonal conflicts and concerts of interest. If my planning horizons are broad – if I act with social and ethical conscience and concern for my impact on others – then I incorporate more of your needs into my own decisions, while with narrow planning horizons I may not give a damn about you! There are many ways to think on this link of horizons to interdependence; the primary point is that planning horizons affect our social relations.

To summarize what has been said thus far, the difference of substitution from complementarity – or the balance between them in any application – is *horizonal* at its core, and so is subject to horizon effects and their direction of change. A myopic world is torn by conflict, the strength of which evaporates as we extend our views.[3] An expansion of planning horizons is socially palliative in this sense: the farther around us that we see and account for our radiant impact, the more peaceful and tranquil our social milieux. This suggests we examine our social policies for their horizon effects. Such is the key to growth and development (Jennings 2011a): longer and broader horizons will make everything function better, and will increase social cohesion and organizational health. But what are the institutional implications of substitution as compared to complementarity? Why might horizon effects, shifting this balance, matter to us?

III. The Institutional Implications of Substitution and Complementarity[4]

First, there is a relation between substitution and independence assumptions, with the latter required for additivity and aggregation by sums. As Krupp (1982, p. 390) pointed out: "Axioms of independence ... lead directly to the laws of substitution... Independence means that the behavior of the elementary unit can be described without reference to the behavior of other units." But "interdependence can lead to *complementarity*," according to Krupp, which shall imply a different outcome, such as that described by Myrdal (1978, p. 774) in his explanation of "why circular causation normally will have *cumulative effects*." In this situation, nothing is subject to any simple summation: the amount or intensity of any element changes all the others in a synergistic self-reinforcing concatenation of forces. The very measurements central and dear to all economic constructions slide beyond our rigorous schemas, sending us into other researches such as of chaotic complex systems analysis in nonlinear realms. A fully-interdependent network constructed upon increasing returns

[1] For example, a psychotic might think her range is infinite, spanning a new and global conscience, where reality and true outcomes show rather short horizons in fact. Consequently, the better the 'fit' of imagined projections to facts and truth, the longer and broader can be the horizon underlying a choice, where every decision reflects some horizon.

[2] Economics has shown the analytical power of ordinal linkages such as those in price/quantity or income/welfare relations.

[3] We currently live in a violent world, torn by competitive values. If competition – as argued here – reinforces short and narrow horizons, it is substitution assumptions that are causing this strife. Competition may not yield the ideal of efficiency here; rather, rivalry may underlie a myopic culture in self-destruct mode, tearing apart our social fabric and ecological systems.

[4] Some parts of what follows are drawn from Jennings (2012b).

suppositions – such as in transportation – does not so well conform to orthodox standards or market domains. But within network contexts, some insights can be offered.

A transportation network combines substitution and complementarity in nondecomposable links (Jennings 1985, 2006); routes are related to each other in ways that turn on goals and direction, just as the relative value of goods stands on an agent's purpose and context. There is no way to disaggregate the unity of these systems, or to study a part by ignoring the rest of fully-interactive feedbacks. Substitution and independence suffer easy escapes from the realities of the interdependence supposed by complementarity. A serious problem of institutional choice and social incentive design is embedded throughout transportation networks, since substitution calls for competition and complementarity yields a reciprocal case for cooperation as optimal organizational forms. Where both coexist in a nondecomposable mix, what do we do? Can we determine which is essential in a specific case? Or, at the very least, might it be possible to distinguish rivalrous from mutual gains so to separate substitutes and link complements? Although such fine design parameters can indeed be imagined (daintily), they vary so readily in response to purposive variation and horizonal length – in the presence of wants and settings shifting constantly over time – perhaps another resort should be sought. The seeds for an alternative view were laid by a neighboring discipline and they open a relevant door to the role of horizonal theory.

Assumptions can be self-reinforcing. Social systems set in place a design of incentives that shape behavior. If the premises on which they rest diverge from actuality, a pathological pattern of action can be seen to emerge. Management theorists suggest a relation among conflict and time perspectives in hierarchical organizations (cf. Simon 1971, p. 204). "Man does not generally work well with his fellow man in relations saturated with authority and dependence, with control and subordination..." (Simon 1971, p. 210). Interhorizonal complementarity means that treating adults like children will bring immature responses. Argyris (1971, pp. 262-63, 268-69) said that in these settings mature people exhibit pathological signs of "frustration, failure, short time perspective and conflict." These symptoms of human need deprivation will lead to organizational fragmentation through "competition, rivalry, ... hostility and ... a focus toward the parts rather than the whole." When a wrong model is used to design an institutional incentive structure, we should expect to see pathological symptoms of organizational stress such as those Argyris states. Sadly often, we reap what we sow.

The impact of substitution assumptions on organizational process has been nothing short of disastrous, showing costs in awareness and actions. Separation and distance, such as supposed by assertions of independence, simply undervalue what goes on in communication as the essence of organization. There is a costly impact due to impersonal institutions. Kaplan (1985, p. 478) drew a connection to our theories of information:

> *Here is the shortcoming of applying to interpersonal communication the depersonalized model so useful in the mathematical theory of information. In that model, coding by the transmitter and decoding by the receiver are separable and independent processes. In the life of dialogue, however, there is a continuous interaction... What is happening is not transmission ... but the emergence of a shared meaning... The interchange is not just communication but a species of communion by which alone ... each participant in the dialogue first becomes a person.*

In this sense, organizations survive and thrive on cooperation, where reciprocity and a budding respect for each other rule the day. Katz and Georgopoulos (1971, pp. 136-38) show how the roles of personal ethics, social values and cooperation are important to organization thus:

> *The great need of our time is a reformulation of social values. ... In the first place, research and observation show that the norm of reciprocity, of cooperation, of mutual helpfulness, runs wide and deep. Organizations could not exist without many uncounted acts of cooperation which we take for granted. ... In the second place, justice and fairness are not outmoded values. ... It is important to emphasize ... justice and fairness ... and to introduce reforms where inequity is the practice. In the third place, social responsibility ... has a potential that remains to be developed. ... All of these values are related to ... the democratic ethic which is still our basic creed. ... Organizational reform needs such a value base both as a set of social principles and as guidelines for action.*

The point is about the harmful effects of authoritarian or hierarchic conceptions of organizational structure reducing cooperation. All this says that dominant features of our economic culture result from organizational stress stemming from improper representations in the design of our institutions, showing express psychological symptoms of ill health including conflict, competition, materialism, myopia and disruption of effort. Why is this occurring? As Simon (1981, p. 167) outlined the issue in a more specific context: "A design representation suitable to a world in which the scarce factor is information may be exactly the wrong one for a world in which

the scarce factor is attention." Here we have a similar problem of organizational structure resting on substitution assumptions in a context of complementarity, yielding conflicts, short horizons, immaturity and disengagement. These are all symptomatic of horizon effects and a myopic culture, reflecting a deep pathology in our social organization. We need to learn to cooperate where we continue to compete, creating conflict out of thin air.

Abraham Maslow (1954, 1968) offers some insights in his stages of human development: basic consumption demands (shelter, food, clothing, etc.) are materialistic in nature, that – once met – bring forth higher-order, less tangible needs: this implies that human relations shift away from substitute goods in favor of complementary yields as we mature and grow. In that case, our institutions should also evolve away from competition in favor of cooperation or social advance is stifled due to higher-order need deprivation (Jennings 2011a); this is a likely source of these symptoms of organizational stress. McGregor (1971, pp. 310-11) described the problem well:

> *The deprivation of needs has behavioral consequences. ... The man whose needs for safety, association, independence or status are thwarted is sick, just as surely as he who has rickets. We will be mistaken if we attribute ... passivity, or ... hostility, or ... refusal to accept responsibility to ... inherent 'human nature.' These forms of behavior are symptoms of illness – of deprivation of ... social and egoistic needs.*

McGregor went on to explore the connection to rampant consumerism and materialism in modern cultures:

> *... the fact that management has provided for these physiological and safety needs has shifted the motivational emphasis to the social and egoistic needs. Unless there are opportunities at work to satisfy these higher-level needs, people will be deprived; and their behavior will reflect this deprivation. ... People will make insistent demands for more money under these conditions. It becomes more important than ever to buy the material goods and services which can provide limited satisfaction of the thwarted needs. Although money has only limited value in satisfying many higher-level needs, it can become the focus of interest if it is the only means available.*

A central theme of horizonal theory is that the nature of human relations is not substitutional but complementary. If so, competition is not just stifling output of intangibles such as information and knowledge but also is shortening planning horizons, spawning a myopic culture, revealing insidious symptoms of higher-order human need deprivation. But these horizon effects cannot be seen without a horizonal theory; a corollary of selective focus is a restrictive blindness. Standard economics is insistently blind to these phenomena.

Understanding the self-reinforcing character of substitution assumptions and their institutional lessons shall be important too. Believing "that people are motivated by self-interest and by ... power and wealth" will lead to precisely these human traits as "self-fulfilling" effects of organizations so designed (Senge 1990, p. 274). As Badaracco and Ellsworth (1989, as quoted in Senge) explain:

> *If people are assumed to be motivated only by self-interest, then an organization automatically develops a highly political style, with the result that people must continually look out for their self-interest in order to survive. An alternative assumption is that, over and above self-interest, people truly want to be part of something larger than themselves. ... When organizations foster shared visions, they draw forth this broader commitment and concern.*

If economic connections are more complementary than substitutional, our rivalrous systems are not enhancing but reducing output and welfare. As McGregor (1971, p. 317) so wisely put it: "Fish discover water last." We are so used to competitive values and their wrongly applauded directives (Kohn 1986; Rosenau 2003), we cannot see what we miss thereby. A fundamental lacuna in economics is that opportunity cost remains unseen: we cannot know what we do not choose, or what it might feel like to wear. Our image of cost is founded on theory and, if our theory is wrong – if substitution assumptions do not prevail in the most general case – then we may be designing our systems for loss rather than actual gain. The cultural implications show why.

IV. The Culture of Complementarity[5]

The opportunity cost of our competitive values and culture resides in a theoretical realm of cooperation and belief. This notion of 'opportunity cost' has never been nicely integrated into economics since unexplored options stay invisible and devoid of factual life; we must imagine how these 'foregone alternatives' sculpt our regimes. Standard theories – supposing substitution throughout our relations – sketch the evil losses from cooperation with price hikes and output restrictions for profit (through rent seeking and market power abuse), showing competition as an optimal means of productive efficiency. Yet generalized complementarity yields

[5] Some portions of what follows are drawn from Jennings (2011c).

stunningly opposite outcomes: cooperation is sought, and competition is self-destructive, fomenting conflict where it is absent. The flip is hard to imagine for an economist trained to orthodox standards.

So let us strive to do so. In some milieux, concord thrives. In families and business settings, such is the aim of organization and the behavior we see. Competition for love in a family is destructive in the extreme; jealousy is so toxic, conflict emerges as a result, tearing apart the fabric of closeness so crucial to family life. For management goals, such bitter rivalries sunder any alignment of effort; there is a surfeit of organizational literature on this subject (some of it quoted above). Where interests join, competition is very counterproductive; we ought to be working together in the service of mutual ends: separation will fail.

These points seem sufficiently obvious, one might pause to state them openly. Yet they also run counter to many economic convictions. Again, competition holds sway in economics because substitution assumptions are often taken for granted, held to apply across all domains, from productive inputs through consumer goods into social relations. So may equilibrium models – in all their rigorous sweeping conquests – survive for rivalrous settings, shoving all other approaches aside. The implications of complementarity – of positive feedback, cumulative causation, and open complex systems – supply no easy answers or any closed, stable outcomes.

Here the economy is like an unfolding ecological process, so utterly interdependent in time as well as across social space that there is no point to partial analysis save that it may be the best we can do. Here the problem is not just that effects spread outward forever on all, but rather that we cannot see or project those effects in advance of action: in short, the relevant boundary here is not existential but *horizonal*, linking to what Simon (1982-97) defined as the bounds of our rational faculties in a complexly uncontained world. Indeed, the notion of planning horizons sums to a formalization of this: substitution needs no horizon, while complementarity as an assumption demands some limit to our understanding as a frame of analysis. In fact, the very balance of our relations is horizonal: longer and broader horizons shift this scale in favor of complementarity, while myopic concerns stress substitution over reciprocal interests. The culture of complementarity is one of horizon effects.

One comparative frame for economic cultures based on substitution or complementarity would be on their individualism and their inclusion of others in decisions or reflections thereon. The self-orientation of agents in the United States is here contrasted with Eastern cultures' embrace of "harmonious interdependence." As Peterson and Chang (2003, p. 69) put it in an essay on human 'flourishing':

> *... Western cultures have been described as being individualistic. In such cultures, individuals are expected to seek independence from others by attending to the self. As a result, individuals from such cultures grow to develop a sense of the self largely independent of others. In cultures where the independent self is predominant, we find a self-enhancing bias involving overly positive views of the self, illusions of control, and unrealistic optimism.*
>
> *In contrast, the focus in Eastern cultures traditionally has been on a view of the individual who maintains a fundamental relatedness with others. Attending to others, harmonious interdependence with them, and fitting in not only are valued but are often expected, which results in an interdependent view of the self.*

Furthermore, if our rampant selfishness is symptomatic of short horizons in a myopic culture, then accepting this sort of behavior as 'natural' is a part of the problem. The difference in economic cultures seen in this paper is also horizonal. If so, then a look at the cultural aspects of competition and cooperation should help to frame their difference. A means to do so is through a use of 'fear' vs. 'love' as a way to distinguish these systems' psychological impact.

Competition, too often, is based on a culture of fear and threat. But it is not always the case that fear rules in competition, any more than love will always be the hallmark of cooperation. Every organization is different, and people deal with environments and cultures in diverse ways. So one must understand that this simplistic classification of 'fear' and 'love' as a basis for comparison is only that: it serves as an easy way to capture these systems' central divergence. However, with that disclaimer, the social implication of substitution and competition is that others are generally seen as opponents, so in terms of a conflict of interest. In this sense, competition entails a rivalry of individuals, such that everyone needs to guard their position from others' unwelcome incursions. Kohn (1986, pp. 55, 61-65, 108, 110, 113, 123, 129-31 and 143) described the psychological impact of competition thus:

> *The simplest way to understand why competition generally does not promote excellence is to realize that trying to do well and trying to beat others are two different things. ... Competition ... precludes the more efficient use of resources that cooperation allows. ... Beyond the greater efficiency of cooperation, it is also true that competition's*

unpleasantness diminishes performance. ... At best, the stressfulness of a competitive situation causes us to try to avoid failure. And trying to avoid failure is not at all the same thing as trying to succeed. ... Competition does not promote excellence. ... Whereas cooperation apparently contributes to high self-esteem, competition often seems to have the opposite effect. ... Psychological health requires unconditionality... In competition, by contrast, self-esteem is conditional. ... Something very like an addiction is at work here... : the more we compete, the more we need to compete. ... In sum, the security that is so vital to healthy human development is precisely what competition inhibits. ... Competition does not promote ... substantial and authentic ... individualism. On the contrary, it encourages rank conformity [and] ... dampens creativity. ... Creativity is anticonformist at its core; it is ... a process of idiosyncratic thinking and risk-taking. Competition inhibits this process ... [and] affects the personality. Turning life into a series of contests turns us into cautious, obedient people. ... The chief result of competition ... is strife.

So this is one view of how an individualistic culture of fear, stress and strife fails us. We look to rivals as opponents, each against the other. We think it is in our collective interests to compete with each other, as so many have forcefully argued. But there remain doubts, some voiced by Kohn. Now let us look at the contrast with complementary systems.

When one assumes that others' interests are in line with one's own, the social scene changes in radical ways. First, if I believe your well-being contributes to my own, then I will make as much effort to help you as I do for myself; indeed, the premise erases any distinction between my own needs and yours! This is essentially what Nelson (1981, pp. 1053-55) said, translated to human relations: "If factors are complements, growth is super-additive... The growth of one input augments the marginal contribution of others." In this setting, individualism does not apply: "there are not neatly separable sources of growth, but rather a package of elements all of which need to be there." In other words, cooperation is sought to actuate complementarities and to allow human flourishing. There is scant distinction to be made between one and another in terms of individual needs. All of us rise and fall together; the more fluidly we can work as a team, the better off everyone is.

But, second, the limit to bountiful collaboration is the sort of behavior rewarded by competition! Selfish predation and opportunism make cooperation impossible; everyone needs to be on the team, to work in full concert together, or this form of social organization fails to meet its potential. Alas, success is rare in this setting; we are so used to our own way that teamwork gets out of reach. This is the real tragedy of competition and what it teaches; selfishness, far from being a virtue (Rand 1964), overrules successful pursuit of complementary efforts. We never see what we miss.

So we have two economic cultures, simply characterized as those of 'fear' and 'love.' One is rife with opposition and conflicts of interest as its story, yielding a culture of fear reflected in stress and strife across society. The other is open through common needs to embracing concerts of interest, if team members can set aside their personal inclinations sufficiently to work for the welfare of all, to ease their resistance and see each other with loving care and compassion (Jennings 2010). We are all prisoners of this dilemma; arguably, it is a primary source of our social malaise (Jennings 1986). Recent work in neuropsychology also informs the gulf between these two alternative frames.

Economics is about decisions. But all acts of choice – rational or not – demand the successful projection of actual outcomes through some causal reasoning by a selective and uncertain mind. The process involves speculation: 'If I kick things here and not there, this will result and not that.' But what are the goals and intent of our actions? In the most general sense, we work against negative and for positive feelings (hopefully including others but not necessarily so). We strive for 'well-being,' not always successfully, with many slips between cup and lip. Psychology ought to be at the center of all economic constructions.

For one thing, we live in a social world where reactions by others should be a critical part of understanding what we do and results thereof. As Norris and Cacioppo (2007, p. 87) point out:

... human beings are fundamentally social creatures. And ... emotions may have evolved to promote cooperation and communication in a social group... Social information is highly valued and critical for survival... From birth, we engage in behaviors intended to ensure affiliation with other members of the species, especially caregivers.

Whenever we make a choice, we perceive its situational context, apply a causal model thereto as part of the process of understanding its structure and operation, project the potential outcomes of diverse courses of action, and then evaluate the alternatives and select an option based on possible likelihood and worth. The value-assessment has an emotional aspect – that may be its central feature – seen as positive (for affinity) or negative (for retreat) that informs our best course of action.

But how do we know what others will do, reacting to our decisions, and how do we know what they might think or decide autonomously on their own? All will affect the results of our choices, so we develop prior expectations of others' vantages along with their intentions. This calls for an empathic grasp of people that is not automatic; empathy should be a part of economists' understanding of choice, which is a normative process of multidimensional causal projection that includes others. Indeed, as Norris and Cacioppo (2007, p. 93) observe, "it can be dangerous not to read correctly the motives and intentions of others. ... Accurate evaluation of the motives [and emotional states] of others ... are skills necessary for navigating our social world."

Recent findings in neuroscience shed light on empathic capacity; mirror neurons suggest "a common neurobiologic dynamic for our understanding of others" in which "we mentally ... imitate every action we observe... ...Mirror neurons help us share others' experience as reflected in their expressions, providing a biological basis for empathy..." (Dobbs 2006, pp. 1-2). Decety (2007, p. 252) elaborates: "This model posits that perception of emotion activates in the observer the neural mechanisms that are responsible for the generation of similar emotion. Such a system prompts the observer to resonate with the emotional state of another individual..." As Gallese (2004, pp. 4-5) put it:

> *Successful perception requires the capacity of predicting upcoming sensory events. Similarly, successful action requires the capacity of predicting the expected consequences of action. As suggested by an impressive and coherent amount of neuroscientific data, both types of predictions seem to depend on the results of unconscious and automatically driven neural states, functionally describable as simulation processes. ... Such body-related experiential knowledge enables us to directly understand some of the actions performed by others, and to decode the emotions and sensations they experience. Our seemingly effortless capacity to conceive of the acting bodies inhabiting our social world as goal-oriented persons like us depends on the constitution of a "we-centric" shared meaningful interpersonal space. ... Intentional attunement, ... by collapsing the others' intentions into the observer's ones, produces the peculiar quality of familiarity we entertain with other individuals. This is what "being empathic" is about. By means of a shared neural state ... the "objectual other" becomes "another self."*

However, the process is neither direct, automatic or simple. Mirror neurons, according to Iacoboni (2007, p. 447), "do not simply provide an action-recognition mechanism but rather represent a neural system for coding the intentions of other people" that "seems to reflect a more holistic stance toward contexts, actions and intentions." As Norris and Cacioppo (2007, p. 96) explain:

> *One example of the effects of social context on emotion is that of empathy... By definition, empathy cannot occur in the absence of a social context. ... Empathy, however, is not always the adaptive response...; motives, intentions, and context must be taken into consideration to generate an appropriate response. ... Thankfully, ...we are able to reason and make inferences about others' mental states.*

But how we make these social connections is also related to physiological and mental health and well-being. As Carter (2007, pp. 425, 434) notes:

> *...the major challenge for science in the 21st century is developing an understanding of the processes and mechanisms responsible for health. It is increasingly clear that health is not simply the absence of illness but that it includes active processes, maintained in part by social interactions and social bonds[, the benefits of which] ... have been described in epidemiological studies. Perceived social support is often negatively correlated with various illnesses, ranging from mental illness to heart disease and cancer. ...*

A supportive social environment is important to health and happiness, security and progress, and is vital to human well-being. Cooperation offers such benefits, so alien to competition: economists should take note. Taylor and Gonzaga (2007, pp. 466-67) find it "intriguing" that "the affiliative system ... continues to have such powerful effects on health and survival into the present day ... through social support and social integration..." They elaborate on what has been learned:

> *Research consistently shows that social support reduces psychological distress, such as depression or anxiety, and promotes psychological adjustment to a broad array of stressful conditions. ... In both animal and human studies, social isolation is tied to a significantly enhanced risk of mortality and a heightened risk of both chronic and acute health disorders. Although not all the mechanisms ... are known, one key pathway is via stress responses. ... People without social support systems, for example, are more vulnerable to infectious disorders. Correspondingly, the positive impact of social ties on health outcomes is ... powerful...*

Norris and Cacioppo (2007, p. 88) highlight the role of social links in human health and functionality, where social relationships have important benefits starkly in contrast to the risks of personal isolation. As Cacioppo, Petty and Tassinary (1989, p. 83) note: "...The leading causes of disability and death in Western civilizations have substantial social and behavioral components..." Uchino et al. (2007, pp. 474-75) elaborate on the medical aspects of social connectedness:

> *Social processes are among the more powerful psychological predictors of physical health outcomes. As predictors or mechanisms, social events appear to play important roles in both the development and exacerbation of physical health conditions. ... [A] social neuroscience perspective is critical to understanding the links between social ties and health outcomes.*

They also review the harmful effects of stress and how biological function depends on healthy social relations (Uchino et al. 2007, p. 480).

As noted by Kohn above, competition creates strife and stress, so harmful to human health. Much research has been addressed to the health effects of stress; Kudielka et al. (2007, pp. 56-57) note that: "The World Health Organization (WHO) concluded that stress is one of the most significant health problems in the 21st century." Taylor and Gonzaga (2007, pp. 456-57) add that, unlike its long-term effects, stress has short-term survival benefits in certain 'fight or flight' situations ...

> *... because [these responses] mobilize the body to meet the demands of pressing situations and then prime homeostatic mechanisms that restore the body to its previous functioning. With repeated or recurrent stress, however, biological stress responses can have long-term costs that have [harmful] implications for health...*

These authors raise some questions about these effects, since "fighting or fleeing may not be humans' best defense against predators." Instead, they pose another strategy that they term "'tend' and 'befriend'": "...there are good reasons to think humans have evolved to use social relationships as a primary resource to deal with stressful circumstances." Indeed, as they put it:

> *From animal studies and our own data, we infer that there is an affiliative neurocircuitry that prompts affiliation, especially in response to stress, in many animal species, and especially in humans. ... That is, just as people have basic needs, such as hunger, thirst, sexual drives, and other appetites, they also need to maintain an adequate level of protective and rewarding social relationships.*
>
> *Just as occurs for these other appetites, we suggest that there is a biological signaling system that comes into play if one's affiliations fall below an adequate level. Once signaled, the appetitive need is met through purposeful social behavior, such as affiliation. If social contacts are hostile or unsupportive, then psychological and biological stress responses are heightened. If social contacts are supportive and comforting, stress responses decline. Positive contacts then lead to a decline in need and, in the context of stress, a decline in stress responses.*

They conclude that: "A picture of the emerging regulatory role of affiliation in response to stress and its biological underpinnings is coming into view." (Taylor and Gonzaga 2007, p. 469)

With affiliation known as important to manage or reduce stress, and isolation seen as harmful to health, is it not time to reassess the economic claims for competition on these grounds? If competition is not efficient due to increasing returns and complementarity – if competition is stressing us out, destroying our health and well-being, physically and psychologically – is it not time to take another and closer look at cooperation and its social amenities, which include a range of physiological and mental health-related aspects? Indeed, further research has shown the horizonal implications of economists' stubborn adherence to the competitive frame and its myopic culture. Do we not know that our cognitive faculties – and our horizonal range – are affected by our emotions in both positive and negative ways? Tomasino (2007, pp. 530-31) explains the relation of open minds and tolerance to our emotional orientation:

> *In short, positive emotions appear to broaden the scope of perception, cognition, and behavior and to enhance creative and intuitive capacities. Conversely, negative emotions tend to restrict perception, produce more reactive, rigid, and stereotypic patterns of thought and action, and have been found to be associated with reduced task performance and impaired intuitive judgments.*

Negative feelings block physiological functionality at all levels, as some meaningful research has shown. Arguelles, McCraty and Rees (2003, pp. 15-16, 20) elaborate on the effects of stress, which...

> *... causes our system to get 'out of sync' – not only mentally and emotionally, but also physiologically. ... The result is emotional incoherence, increased energy drain, and added wear and tear on the body. ... During emotional*

stress, when the heart transmits a disordered signal to the brain and activity in the nervous system is chaotic or desynchronized, higher cognitive functions are inhibited – limiting our ability to think clearly, focus, remember, learn, and reason.

The effects of positive feelings are the reverse, improving mental and bodily functions in diverse ways:

In contrast, sustained positive emotions, such as appreciation, love, and compassion, are associated with highly ordered or coherent patterns in the heart rhythms, reflecting greater synchronization ... and increased physiological efficiency. Thus, sincerely experiencing positive feelings helps us get (and stay) 'in sync' ... often resulting in enhanced focus, memory recall, comprehension, and creativity.

So positive feelings have physiological and mental health effects; they "have been demonstrated to improve health and increase longevity, increase cognitive flexibility and creativity, facilitate 'broad-minded coping' and innovative problem solving, and promote helpfulness, generosity and effective cooperation" (Childre and McCraty 2001, p. 13). Seligman and Csikszentmihalyi (2000, p. 5), leading adherents of 'positive psychology,' describe the general approach of this discipline as being "about positive individual traits" and "the institutions that move individuals toward better citizenship," calling for greater collaboration in our social systems.

Frederickson and Losada (2005, pp. 678-79) address such issues in terms of patterns of 'flourishing' vs. 'languishing.' "*To flourish* means to live within an optimal range of human functioning, one that connotes goodness, generativity, growth, and resilience. ... Epidemiological work suggests that fewer than 20% of U.S. adults flourish and that the costs of languishing are high; ...languishing brings more emotional distress, psychosocial impairment, limitations in daily activities, and lost work days." They explain that "a key predictor of flourishing is the ratio of positive to negative affect. ...

A wide spectrum of empirical evidence documents the adaptive value of positive affect... Beyond their pleasant subjective feel, positive emotions ... carry multiple, interrelated benefits. First, these good feelings alter people's mindsets: Experiments have shown that induced positive affect widens the scope of attention, broadens behavioral repertoires, and increases intuition and creativity. Second, good feelings alter people's bodily systems: Experiments have shown that induced positive affect speeds recovery ... and increases immune function. Third, good feelings predict salubrious mental and physical health outcomes: Prospective studies have shown that frequent positive affect predicts (a) resilience to adversity, (b) increased happiness, (c) psychological growth, [etc.]. ... And fourth, perhaps reflecting these effects in combination, good feelings predict how long people live: Several well-controlled longitudinal studies document a clear link between frequent positive affect and longevity.

Although these authors do not employ the concept of 'planning horizons' in describing their "broaden-and-build theory" of positive emotions, their explanation is so resonant with horizonal elements with respect to broadening human perspective, flexibility, openmindedness and general learning effects that the lesson is clear. Planning horizons offer an organizing principle for this research, while 'horizon effects' suggest their relevance to economic behavior. Frederickson and Losada (2005, pp. 679) explain the implications of their theory:

The theory holds that unlike negative emotions, which narrow people's behavioral urges toward specific actions that were life-preserving for human ancestors (e.g., fight, flight), positive emotions widen the array of thoughts and actions called forth (e.g., play, explore), facilitating generativity and behavioral flexibility. Laboratory experiments support these claims, showing that relative to neutral states, induced negative emotions narrow people's momentary thought-action repertoires, whereas induced positive emotions broaden these same repertoires.

The entire process is wholly horizonal in its expansion/retraction of the range of human awareness and choice:

The theory holds that in contrast with the benefits of negative emotions – which are direct and immediately adaptive in life-threatening situations – the benefits of broadened thought-action repertoires emerge over time. Specifically, broadened mindsets carry indirect and long-term adaptive value because broadening builds enduring personal resources, like social connections, coping strategies, and environmental knowledge. ... These findings suggest that positive affect – by broadening exploratory behavior in the moment – over time builds more accurate cognitive maps of what is good and bad in the environment. This greater knowledge becomes a lasting personal resource. ... Put differently, because the broaden-and-build effects of positive affect accumulate and compound over time, positivity can transform individuals for the better, making them healthier, more socially integrated, knowledgeable, effective, and resilient. ... This evidence motivates our prediction that positive affect is a critical ingredient within flourishing mental health.

Frederickson and Losada (2005, p. 680) see *adaptive flexibility* as one of the hallmarks of our emotional systems and their physiological impact. "In both cardiac and neurological systems ... seemingly unpredictable local changes give rise to stable and flexible global outcomes." They apply this to human emotional systems:

> *A similar dynamic emerges for positive affect systems. ... The broaden-and-build theory holds that the momentary unpredictability characteristic of positive states over time yields resilience that allows people to flexibly adapt to inevitable crises. The links ... have been demonstrated empirically at multiple levels of analysis. Within individuals, people induced to feel positive emotions ... report wider arrays of action urges in the moment... Despite this momentary unpredictability of affect and behavior, over time, people who regularly experience positive affect exhibit greater resilience to adversity. ... Within business teams, higher levels of expressed positivity among group members have been linked to greater behavioral variability ... as well as to long-range indicators of business success. And within organizations, positive experiences have been linked to broader information processing strategies and greater variability in perspectives across organizational members as well as to organizational resilience in the face of threat.*

Frederickson and Losada (2005, pp. 680-81) describe research suggesting "high ratios of positive to negative affect would distinguish individuals who flourish from those who do not" saying: "This *positivity offset* equips individuals with the adaptive bias to approach and explore novel objects, people, or situations," implying "that optimal mental health is associated with high ratios of positive to negative affect."

So psychological research has found learning activity to be a part of positive emotional affect; its long-run impacts show up in the form of "global stability" due to greater resilience in the face of crisis, stress, surprise or other disruption. But there is also a role for 'negativity' in our emotional makeup, and 'positivity' must be genuine to contribute to healthy behavior. As the authors (Frederickson and Losada 2005, pp. 684-85) explain, "problems can occur with too much positivity and appropriate negativity may play an important role within the complex dynamics of human flourishing. Without appropriate negativity, behavior patterns calcify. We use the term *appropriate negativity* because we suspect that certain forms of negativity promote flourishing better than others" such as conflict engagement in marriage (vs. disgust and contempt which "are more corrosive").

> *Just as negativity within the dynamics of human flourishing must be appropriate, positivity must be both appropriate and genuine. Studies of human nonverbal behavior document that smiles that are ingenuine or otherwise disconnected from current circumstances lose credibility as expressions of internal states ... suggesting that feigned positivity may be more negative than positive. These findings underscore the importance, in the pursuit of human flourishing, of seeking genuine positivity – meaningfully grounded in the reality of current circumstances – rather than feigned, forced, or trivial positivity.*

This is similar to Pert's (1997, pp. 192-93) point that "*all* emotions are healthy, because emotions are what unite the mind and the body. ... All honest emotions are positive emotions." So now we have arrived at the point where all this information needs to be summarized, synthesized and drawn together.

Above, two systems of competition and cooperation were characterized – simplistically – as cultures of fear and love, founded on negative vs. positive feelings. So, in advancing this distinction, we argue rivalry augments stress and strife in human relations, supposing a basic conflict of interest due to acquisitive values. Here competition places us all in opposition to each other in a culture resistant to human community and devoted to personal gain against peers' similar efforts. This culture of fear is compared to one of fellowship, based on the complementarity of human needs in a concert of interests. In this setting, community counts, so empathy, caring, compassion and kindness are key to a culture of love. Further, 'horizon effects' suggest that longer and broader horizons are also important to consider: learning activity and adaptive flexibility in a dynamic, complexly interdependent domain are relevant standards for health and well-being. Competition and cooperation entail economic cultures of 'fear' and 'love' for assessment here; the question is which of these organizational systems seem more conducive to welfare? Research in human neuropsychology offers a very clear answer.

A suggestion was made from management theory that organizations treating their members like children will lead to ill health, through a disruption of functionality. This argument can be construed to describe our whole economic culture, revealing pathological symptoms of higher-order need deprivation. Kohn (1986, pp. 55, 143) opines that "competition ... does not promote excellence. ... The chief result of competition ... is strife." For many organizational theorists, an economic culture of competition is part of the problem, manifesting pathological symptoms in the ensuing behavior reflected widely in 'horizon effects' and organizational stress.

Some findings in neuropsychology also imply a competitive failure in the social provisioning process with regard to health and well-being. Designing a social world around the opposition of interests undermines flourishing human communities if we are social creatures. If we are really hard-wired for empathy, or programmed by years of evolution in favor of fellowship – protecting each other and ourselves through close affinity links – such competitive frames sever relations, showing harmful effects. There is a growing body of research showing social support to be an important part of functionality, health and human well-being. Stress, social isolation, conflict and loneliness yield disease. An economic culture resistant to community ties will lead to widespread harm, mental and physical.

Alternatively, positive feelings show health and horizon effects. "Appreciation, care, compassion and love" (Tomasino 2007, pp. 530-31) should be encouraged by any system meant to promote human welfare. Community is an essential part of flourishing in this sense; a competitive fear-based system meets none of these social requirements. Compassion is strongly conducive to human welfare in our relations.

In addition, the notion of 'flourishing' is *horizonal* at its core. Longer and broader planning horizons seem fully in line with these studies; here economics and psychology yield the same conclusions. Psychologists show how broader planning horizons might be encouraged through horizonal lengthening in a supportive, friendly community setting. This shift in social cultures away from opposition toward compassion can be achieved, if we all learn to see our essential goals are really aligned. Thus a new world may open before us, gently inviting us in. A culture of complementarity is a welcoming one indeed, while our competitive values are making us sick and tearing us apart, destroying our ecological life support systems and blinding us to our roles. So will a profound change be needed in our approach, based on new knowledge and organization. How would this be achieved? A few thoughts shall be offered.

V. *A Digression on Social Emergence and the Process of Cultural Change*[6]

The above discussion describes a link between narrow-minded dogmas, stress, strife and fear, as engendered by competition. As Tomasino (2007, pp. 530-31) explained: "...negative emotions tend to restrict perception, [and] produce more reactive, rigid, and stereotypic patterns of thought and action...", while "positive emotions appear to broaden the scope of perception, cognition and behavior..." Childre and McCraty (2001, p. 13) argue that positive feelings "have been demonstrated to ... increase cognitive flexibility and creativity..." Frederickson and Losada (2005, pp. 678-80) tie positive emotion to human flourishing and adaptive flexibility because it "widens the scope of attention, broadens behavioral repertoires, and increases intuition and creativity" and "yields resilience that allows people to flexibly adapt to inevitable crises" while "negative emotions ... narrow people's behavioral urges... [and] narrow people's momentary thought-action repertoires..." The negativity of myopic cultures spawned by competition is subversive to learning and longer horizons.

One of the clearest settings of almost purely complementary interdependence is that of education, in which information of various sorts is mostly what is transacted. As Boulding (1962, p. 133) so wisely explained, teaching "is the one clearly observable process in the universe where the strict laws of conservation do not hold. ... Teaching is in no sense an exchange, in which what the student gets the teacher loses." There are no tradeoffs here, or at least not those subject to substitution. The wide and dogmatic imposition of orthodox standards in academics is symptomatic of an incentive failure in our research institutions. This incentive failure rises from economic concepts ill-fit to their realm of use: substitution assumptions do not apply to a complementary setting of learning and information exchange. The reasons for the rigid, dogmatic character of economics stem from its stolid devotion to competition as our route to efficiency. Again, narrowminded dogma – in displacing other alternative views – stays blind to its own exclusions, so to its opportunity cost. The related case for pluralism is one for economic efficiency in the application, growth and development of intellectual assets. Competition in complementary settings shall lead to incentive failures, such as in ecology, education, information and culture. Rigid dogma in economics is symptomatic of pathology in our research institutions stemming from models unfit to their use – based on substitution assumptions applied to a complementary realm. Pluralism ought to be normal; that this is not the case suggests some problems in need of attention.

From our earliest time, man has organized into groups. These social systems – in all their rampant diversity – offer a complex panoply of frames and cultural legacies. So many analytical options stand before researchers, single approaches seem problematic as a means to full understanding, especially in that any perspective is always selectively focused. Yet the orthodox standard in economics simply asserts one model of maximization against a constraint in a market domain of acquisitive values, as if that were all one needed to absorb this rich array! It is as if economists sought to cram everything into one mold to make it amenable to such methods. 'If all one has is a hammer, then everything looks like a nail.' Much has been said on the hegemonic control of economics – in its incentives and arrested development – held by neoclassical zealots.[7] Our rigid dogma rises from competition in education. Academic rivalry entails a defense of ideas against change, and therewith a view

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[6] Some parts of the following discussion are drawn from Jennings (2008a and 2012b, note 5).

[7] Cf., e.g., Leontief (1983). Mueller (1984, p. 160) noted that: "Neoclassical economics reigns supreme, not because it refutes challenges to it, but because it ignores them," to which Hart (1984, p. 189) replied thus: "I think that most economists retain the neo-classical methodology [because] ... there is at this point no satisfactory alternative to neo-classical theory," a claim also made by Hahn (1981, p. 129). But Simon (1979, p. 510) disputed this view in his 1978 Nobel Lecture: "...There is an alternative. If anything, there is an embarrassing richness of alternatives." Nicholas Kaldor (1972, p. 1240) expressed frustration with this situation:

> *In fact, equilibrium theory has reached the stage where the pure theorist has successfully (though perhaps inadvertently) demonstrated that the main implications of this theory cannot possibly hold in reality, but has not yet managed to pass his message down the line to the textbook writer and to the classroom. ...Without a major act of demolition – without destroying the basic conceptual framework [of orthodox equilibrium economics] – it is impossible to make any real progress.*

Earl (1983, p. 121) offered the following explanation for the enduring persistence of orthodoxy in economics:

> *Our analysis leads to two connected ways of explaining the dominance of neoclassical economics. One is that it is safer and more rewarding to be an equilibrium theorist of the conventional kind. The other is that upbringings affect the constructions young economists form of what it is that economists do and they then act in conformity with this image unless given an exceedingly strong cause to behave otherwise. Kuhn's suggestion that a scientific revolution will not succeed until older scientists have died off seems entirely reasonable from a behavioral standpoint. If a mature scientist is to undergo a personal scientific revolution she will have largely to dispense with a well-formed world view. Since the choice will not usually be clear-cut, such a transition, if made, would entail a period during which she suffered nothing short of a scientific nervous breakdown.*

of other approaches as a potential threat to be undermined and disarmed. This is not a rubric conducive to open learning or research. In a real learning environment, diverse approaches are encouraged, greeted as novel angles of view. We cannot see outside our own outlook, save from another vantage. This is the scientific case for multiple models and pluralism, and why academic orthodoxy is symptomatic of failure. Education – like ecology – is a complementary setting: competitive frameworks are counterproductive. Value is destroyed and not enhanced by rivalrous systems here. Only a reluctance to question what we economists all learned in training conspires to block awareness of this sociopathic conundrum. Mainstream denial is also revealed by the abject treatment of specialties raising questions on orthodox views: methodology, history of economics and economic history are dismissed by orthodox theorists, seen as unimportant. What better evidence could be imagined for the anti-intellectual legacy of a discipline than a shunning of its foundations, background and past truths?

The insights offered above frame an argument that this dogmatism is a direct psychological outcome of our social organization in its stressful impact on our resilience, adaptive flexibility, and our planning horizons. A myopic culture redolent with these feelings of fear and denial cannot cope with incipient change even when overwhelming attention. Narrow minds spawned through rivalrous social inducements stand defensively against all 'opponents' so perceived. The process of breaking out of the impasse is psychological at its core. The challenge of facing and engineering change is addressed in Jennings (1999, pp. 78-79): Organizations shall protect against any threat to their identity; appreciate that self-preservation is their prime directive (Katz and Kahn 1969, pp. 97-98). Selznick (1948, p. 276) counts "self-defensive responses or mechanisms" among the methods adopted by organizations to deal with environmental change, including construction of ideologies and cooptation as self-protection. In an intriguing analysis of the process of organizational change, Tannenbaum and Hanna (1985, pp. 100-101) address its psychology of "Holding On, Letting Go, and Moving On" as three stages of frequently agonizing and painful adjustment. To ease one's hold upon the familiar, anxiety must be confronted, in a manner akin to what Earl (1983, p. 121; cf. note 7) described as "a scientific nervous breakdown."

> *As psychoanalyst Ernest Schachtel* (1959, p. 195, as quoted in T&H, p. 100) *insightfully explains: "The anxiety of the encounter with the unknown springs ... from the person's fear ... that without the support of his accustomed attitudes, perspectives, and labels he will fall into the abyss or flounder in the pathless... Letting go of every kind of clinging opens the fullest view... But it is this very letting go which often arouses the greatest amount of anxiety."*

Tannenbaum and Hanna (1985, pp. 108-15) offer a useful insight on the tenacity of an organization trying to guard its identity in a situation perceived as a threat to its self-protective values: "All human systems ... have boundaries. ... That which is within the boundary gives the system ... its identity (its ego or its self-definition). This identity ... is experienced by the system as essential to its survival." These two organizational theorists identify a series of five steps in "The Process of Letting Go and Moving On" that are: (1) "consciousness raising" (through self-awareness); (2) "re-experiencing" (as a means of getting in touch with the deeper reasons for holding on); (3) "mourning" ("for the loss of the old ways of seeing reality"); (4) "letting go" and then (5) "moving on" ("to new possibilities and new ways of seeing things"). They also note that: "The consciousness raising, re-experiencing, and mourning make possible the letting go, involving a lowering of defenses, a vulnerability, and a receptivity," all of which suggests a broadening of our planning horizons.

They further remark that: "Although our focus ... has been on the individual, ...what has been said about the individual has wide applicability (with appropriate translation) to all human systems." The ease with which 'letting go' is achieved depends upon a number of variables, including: "humanistic values ... interpersonal trust ... stability ... realistic patience ... [psychological maturity and centeredness] ... openness ... psychological strength ... [and] a great need for support (particularly psychological support) as a system moves through the process..." They offer encouragement to people in this situation, noting that though what has been said implies "that this basic change process is rooted in anxiety and pain... as it unfolds, it also releases joy, vitality, and meaningfulness." Tannenbaum and Hanna (1985, pp. 118-20) also ask why all this is so often ignored by organizational theorists, and offer three explanations:

> *In conclusion, ... it is puzzling (...) that so little attention has been given ... to ... the need to hold on – together with the related facilitation of letting go and moving on. ...This avoidance has ... at least three fundamental reasons to explain it...*
>
> *First, there is a culturally embedded fear and reluctance to explore elements in the preconscious or unconscious self... And yet consciousness raising is an essential step in dealing with the need to hold on. ...*

Second, there is the culturally grounded and pervasive fear of feelings (...), particularly of their expression. Most individuals are fearful of their own feelings, and they are threatened by and not sure how to cope with the feelings of others. ... And yet, the re-experiencing of earlier childhood events, together with associated feelings ... is also an essential step in dealing with the need to hold on.

Third, there is the need to mourn... To mourn means to face death ... in order to make a rebirth possible. ...Our intuitions lead us to the possibility that the avoidance by managers and change agents of the need to let go ... is in part, at least, related to a deep fear that involvement in these processes would bring them too close to a confrontation with their own mortality.

In closing, we can only leave the reader with a gnawing dilemma. ...The area to which we have just given our attention is a seriously neglected one... ...Efforts directed at deep change often fail or fall short of desired results because the need to hold on and its working through seem to be so persistently avoided. At a time in history when the demands for change constantly impinge on organizations, this avoidance carries with it most serious consequences. ... At present, we have little wisdom to offer as to how this dilemma can be resolved. But we do have faith that, with an increasing and more pervasive understanding..., it will be resolved in the best interests of all participants in organizational life.

This sensitive analysis of organizational change in the face of necessity echoes Arrow's lament that I have always taken as in reference to the stymied debate in economics on increasing returns. Shortly after Kornai's (1971) book on *Anti-Equilibrium* and a long series of other scathing critiques of equilibrium theory including a series of papers by Nicholas Kaldor (1972, 1975) rejecting this approach on the basis of increasing returns and generalized complementarity, Arrow (1974, pp. 28-29) issued a statement – though undefined as to its specific impetus – clearly addressed to the need to 'move on':

The problem is that agreements are typically harder to change than individual decisions. When you have committed not only yourself but many others to an enterprise, the difficulty of changing becomes considerable. ... What may be hardest of all to change are unconscious agreements, agreements whose very purpose is lost to our minds. ... Even if experience has shown the unexpectedly undesirable consequences of a commitment, the past may continue to rule the present. ...This thinking ... gives rise to the greatest tragedies of history, this sense of commitment to a past purpose which reinforces the original agreement precisely at a time when experience has shown that it must be reversed.

Arrow, of course, is one of the "pure theorists" to whom Kaldor (1972, p. 1240; cf. note 7) refers who have "successfully (but perhaps inadvertently)" shown that general equilibrium theory "cannot possibly hold in reality," when calling for "a major act of demolition" of this approach in order "to make any real progress" in economic conceptions. The largely arrested development of this field that has persisted since 'The Hicksian Getaway' in 1939 (Jennings 2011b) is a direct consequence of the prevalence of substitution assumptions, and of Hicks' ill-founded (and later regretted)[8] denial of time, increasing returns and the implications for complementarity and planning horizons. Instead, the field entered an 'Age of Denial' linked to competitive equilibrium models based on decreasing returns and substitution assumptions, and placed defenses surrounding this view. The dominant paradigm in economics is still equilibrium models, surrounded by a protective fringe of zeal like a moat guards citadel walls. Blaug (1976, pp. 156-57) characterized Lakatos' view of the hard core of assumptions underlying a research program thus: "The 'hard core' is irrefutable by 'the methodological decision of its protagonists'." One cannot challenge or open the gates, since so many alligators swarm out that too often a critic gives up in despair. And this, of course, is the aim. Breaking out of this "cul-de-sac" (Kaldor 1975, p. 347) calls for realistic courage and determination as well. 'Letting go' is never easy...

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[8] Hicks (1977, pp. v-vii) called his 'getaway' "an indefensible trick" that "ruined the 'dynamic' theory of *Value and Capital*":

I must begin with negations. They gave me a Nobel Prize (in 1972) for my work on 'general equilibrium and welfare economics' ... referring to Value and Capital (1939)... This is work which ... was done a long time ago, and it was with mixed feelings that I found myself honoured for that work, which I myself ... have outgrown. How that has been I shall try to explain.

What I now think about Value and Capital is the following. The 'static' part ... is an elaboration of Paretian demand theory... The vistas that opened up were in their way exciting; so it was difficult when writing not to exaggerate their importance. Thus it was that I ... so preposterously exaggerated the importance of the perfect competition assumption, declaring that its abandonment would involve the 'wreckage ... of the great part of economic theory'. I should have said 'the greater part of [that] particular piece of theory...'

In spite of all that has since happened to that particular piece of theory – the further elaborations at the hands of Samuelson, of Debreu and of so many others ... – the time came when I felt that I had done with it. ... Where I now feel that I went wrong was in my attempt to represent ... equilibrium ... [which] was nonsense. ... It was this device, this indefensible trick, which ruined the 'dynamic' theory of Value and Capital. It was this that led it back in a static, and so in a neo-classical, direction.

VI. Conclusion

This paper represents an attempt to examine the culture of complementarity in its sundry aspects. As noted above, if complementarity overwhelms substitution as our most general form of interdependence, cooperation – not competition – emerges as the 'optimal' form of social organization. But generalized complementarity also requires a theory of planning horizons as an analytical lifeline in fully interdependent domains. Indeed, ordinal changes in planning horizons ('horizon effects') shift the balance of substitution and complementarity in our relations among conflicts and concerts of interest, where competition is spawning a myopic culture and cooperation encourages learning and longer/broader horizons. Wherever complementarity rules, our rivalrous systems support divisive violence sundering cooperation, though without justification as there is no reason for opposition. Cooperation in the presence of complementarity is efficient; there is no case for rivalry here, where competition must fail. But that is not the only problem with the competitive frame.

Management theory offers some meaningful lessons on this subject too: organizations set up to reflect traditional views on 'human nature' resting on acquisitive values, selfishness and denial lead to self-fulfilling outcomes symptomatic of human need deprivation. This suggests psychological symptoms of ill health are rampant throughout the society in which we live, framed by economists' substitution assumptions set in place through our rivalrous social systems. So organizational experts say the signs of this sickness surround us in hostility, alienation, disengagement, distress, strife, failure, rivalry, opposition, materialism, myopia and dysfunction. Development is stymied due to economists' substitution assumptions structured into our institutions stifling social advance. Self-fulfilling conceptions stay invisible in the absence of any theory isolating them as significant to our results. We are so used to competitive values and their wrongly-applauded directives, we cannot see what we miss. Fish discover water last. There are more insights to be offered about competition here.

Reviewing the psychological literature also reveals some additional lessons about the effects of fear, stress and negative feelings stemming from our rivalrous social organizations. Competition is shown to be unhealthy, undermining community, affinity and devotion while encouraging alienation, isolation and division. These are related to our well-being in many important ways supported by a lot of valid experiments and other research endeavors. Splitting us off in opposition is shown to be extremely harmful, leading to ill health and disability, even death. The impact of competition on planning horizons is also implicit in the results of these psychological studies, showing a balance between openmindedness and denial to be an aspect of fear vs. love, framed in terms of the negative vs. positive feelings spread by competition and cooperation, respectively. As such a connection also bears on the process of organizational change, the paper examined these subjects.

The tragically arrested development of economics since 1940 is showcased to be an outcome of economists' substitution assumptions and dogmatic commitment thereto, resulting from our rivalrous systems and their effect on behavior and thought. This is one of the great destructive failures of competition in its support for rigid doctrine, narrow attitudes and defensive views. Symptoms of failure abound throughout the waters in which economists swim: our social systems are in disarray, along with our ethics and ecology; everywhere we look, chaos seemingly reigns. Something went terribly wrong at some point: the purpose of theory is, after all, to guide decisions toward development and not destruction. The problem is that our systems stand on erroneous suppositions of substitution when complementarity is a more general form of social relation, especially in the longer runs in which we encounter results! So whether we ever acknowledge – or try to reconcile – the error is simply an issue of finding courage enough for revealing our wrong assumptions and 'letting go' of their rule.

It all comes down to a matter of fear vs. love in ourselves and our institutions. Somehow we have to address suppositions and understand their ramifications, an effort too often dismissed as methodological and thus irrelevant to what is surely a lot more important: the practically-urgent demands of our lives! So we may yield to amaurosis, silence, or retreat. These are not viable options, however. Our only course is to wake.

REFERENCES

Arguelles, Lourdes, Rollin McCraty and Robert A. Rees 2003, "The Heart in Holistic Education," *Encounter: Education for Meaning and Social Justice*, Vol. 16, No. 3, Autumn, pp. 13-21.

Argyris, Chris 1971, "The Impact of the Organization on the Individual," in D.S. Pugh, ed., *Organization Theory*, Penguin, New York.

Arrow, Kenneth J. 1974, *The Limits of Organization*, Norton, New York.

Badaracco, J.L., Jr. and R.R. Ellsworth 1989, *Leadership and the Quest for Integrity*, Harvard Business School Press, Boston.

Blaug, Mark 1976, "Kuhn versus Lakatos or Paradigms versus Research Programmes in the History of Economics," in S. J. Latsis, ed., *Method and Appraisal in Economics*, Cambridge University Press, Cambridge, England, pp. 149-80.

Boulding, Kenneth E. 1962, "Some Questions on the Measurement and Evaluation of Organization" in Harlan Cleveland and Harold D. Lasswell, ed., *Ethics and Bigness: Scientific, Academic, Religious, Political, and Military*, Harper and Brothers, New York; reprinted in Boulding's *Beyond Economics: Essays on Society, Religion and Ethics*, Univ. of Michigan Press, Ann Arbor, 1968, pp. 131-40.

Cacioppo, John T., R.E. Petty and L.G. Tassinary 1989, "Social Psychophysiology: A New Look," in *Advances in Experimental Social Psychology*, Vol. 22, Academic Press, New York, pp. 39-91.

Carter, C. Sue 2007, "Neuropeptides and the Protective Effects of Social Bonds," in Eddie Harmon-Jones and Piotr Winkielman, eds., *Social Neuroscience: Integrating Biological and Psychological Explanations of Social Behavior*, The Guilford Press, New York, pp. 425-38.

Childre, Doc and Rollin McCraty 2001, "Psychophysiological Correlates of Spiritual Experience," *Biofeedback*, Winter, pp. 13-17.

Decety, Jean 2007, "A Social Cognitive Neuroscience Model of Human Empathy," in Eddie Harmon-Jones and Piotr Winkielman, eds., *Social Neuroscience: Integrating Biological and Psychological Explanations of Social Behavior*, The Guilford Press, New York, pp. 246-70.

Dobbs, David 2006, "A Revealing Reflection," *Scientific American Mind*, May/June, available on the web at the following source: http://www.hum.utah.edu/~bbenham/Minds%20and%20Morals/Mirror%20Neurons%20Dobbs.pdf, pp. 1-3.

Earl, Peter 1983, "A Behavioral Theory of Economists' Behavior" in Alfred S. Eichner, ed., *Why Economics Is Not Yet a Science*, M. E. Sharpe, Armonk, NY.

Emery, F. E. and E. L. Trist 1965, "The Causal Texture of Organizational Environments," *Human Relations*, Vol. 18, reprinted as ch. 12 of F. E. Emery, ed., *Systems Thinking*, Penguin (1969), Baltimore, MD.

Frederickson, Barbara L. and Marcial F. Losada 2005, "Positive Affect and the Complex Dynamics of Human Flourishing," *American Psychologist*, Vol. 60, No. 7, pp. 678-86.

Gallese, Vittorio 2004, "Intentional Attunement: The Mirror Neuron System and Its Role in Interpersonal Relations," http://www.interdisciplines.org/mirror/papers/1.

Hahn, Frank 1981, "General Equilibrium Theory" in D. Bell and I. Kristol, eds., *The Crisis in Economic Theory*, Basic Books, New York.

Hart, Oliver 1984, "Comment" on Mueller in P. Wiles and G. Routh, eds., *Economics in Disarray*, Basil Blackwell, Oxford.

Hicks, John R. 1939, *Value and Capital, 2nd ed.* (1942), Oxford University Press, Oxford.

_____ 1977, "Preface (and Survey)" in his *Economic Perspectives: Further Essays on Money and Growth*, Oxford University Press, Oxford.

Iacoboni, Marco 2007, "The Quiet Revolution of Existential Neuroscience," in Eddie Harmon-Jones and Piotr Winkielman, eds., *Social Neuroscience: Integrating Biological and Psychological Explanations of Social Behavior*, The Guilford Press, New York, pp. 439-53.

Jennings, Frederic B. Jr. 1985, *Public Policy, Planning Horizons and Organizational Breakdown: A Post-Mortem on British Canals and Their Failure*, Ph.D. dissertation, Department of Economics, Stanford University, Stanford, CA.

_____ 1986, "Academy, Society and Personal Growth: Some Thoughts on Our Modern Malaise – For My Students," *Tufts Meridian*, April 1983; *Bentley Vanguard*, November.

_____ 1999, *'Scaring the Fish': A Critique of the NRC's Justification for Individual Transferable Quotas (ITQs) and a Systems Analysis of Their Likely Effects*, published by Greenpeace USA, Washington DC and CEEEE, Ipswich, MA.

_____ 2004, "Interdependence, Horizon Effects and Ecological Economics," in Raimound Bleischwitz and Oliver Budzinski, eds., *Environmental Economics: Institutions, Competition and Rationality*, INFER Research Edition, Vol. 10 from the INFER (International Network for Economic Research) Annual Conference 2004, published by VWF (Verlag fur Wissenschaft und Forschumg), Berlin and Wuppertal Institute, Wuppertal, Germany, pp. 293-308.

_____ 2005, "How Efficiency/Equity Tradeoffs Resolve Through Horizon Effects," *Journal of Economic Issues*, Vol. 39, No. 2, June, pp. 365-73.

_____ 2006, "A Horizonal Challenge to Orthodox Theory: Competition and Cooperation in Transportation Networks" in M. Pickhardt and J. S. Pons (eds.) *INFER Research Perspectives, Volume 1: Perspectives on Competition in Transportation*, Lit Verlag, Berlin, pp. 207-19.

_____ 2008a, "Hammers, Nails and New Constructions – Orthodoxy or Pluralism?: An Institutional View," presented at the Association for Institutional Thought (AFIT) Meetings at the Western Social Science Association (WSSA) Annual Conference, Denver, Colorado, April.

_____ 2008b, "A New Economics of Complementarity, Increasing Returns and Planning Horizons" in Wolfram Elsner and Hardy Hanappi, eds., *Varieties of Capitalism and New Institutional Deals*, Edward Elgar, Cheltenham, England.

_____ 2009, "Six Choice Metaphors and Their Social Implications," *Journal of Philosophical Economics*, Vol. II, No. 2, Spring, pp. 34-77.

_____ 2010, "The Joust and the Potlatch as Social Alternatives," presented at the Association for Institutional Thought (AFIT) 2010 Conference, Reno, NV, April.

_____ 2011a, "Does Competition Advance or Retard Economic Development? – An Institutional View," presented at the IIPPE Conference, Istanbul, Turkey, May.

_____ 2011b, "'The Hicksian Getaway' and 'The Hirshleifer Rescue': Increasing Returns from Clapham to Kaldor," presented at the International Initiative for Promoting Political Economy (IIPPE) Conference, Istanbul, Turkey, May.

_____ 2011c, "The Economic Cultures of Fear and Love," presented at the Association for Heterodox Economics (AHE) Conference, Nottingham, U.K., July.

_____ 2012a, "A Theory of Planning Horizons (1): Market Design in a Post-Neoclassical World," *Journal of Philosophical Economics*, Vol. V, Issue 2, Spring.

_____ 2012b, "A Theory of Planning Horizons (2): The Foundations for an Ethical Economics," *Journal of Philosophical Economics*, Vol. VI, Issue 1, Autumn.

_____ 2014, "Atoms, Bits and Wits: A New Economics for the 21st Century," *Forum for Social Economics* (forthcoming).

Kaldor, Nicholas 1972, "The Irrelevance of Equilibrium Economics," *Economic Journal*, Vol. 82, pp. 1237-55.

_____ 1975, "What Is Wrong With Economic Theory," *Quarterly Journal of Economics*, Vol. 89, No. 3, pp. 347-57.

Kaplan, Abraham 1985, "Understanding Method in the Study of People" in Fred Massarik, Newton Margulies and Robert Tannenbaum and Associates, eds., *Human Systems Development: New Perspectives on People and Organizations*, Jossey-Bass, San Francisco.

Katz, D. and R. L. Kahn 1969, "Common Characteristics of Open Systems," ch. 2 in their *The Social Psychology of Organizations* (Wiley, 1966), pp. 14-29, as excerpted in ch. 5 of F.E. Emery, ed., *Systems Thinking*, Penguin, Baltimore.

Katz D. L. and B. Georgopoulos 1971, "Organizations in a Changing World," *Journal of Applied Behavioral Science*, Vol. 7, No. 3, reprinted in John M. Thomas and Warren G. Bennis, eds., *The Management of Change and Conflict*, Penguin (1972), Baltimore, MD.

Kohn, Alfie 1986, *No Contest: The Case Against Competition*, Houghton Mifflin, Boston.

Kornai, Janos 1971, *Anti-Equilibrium: Economic Systems Theory and the Tasks of Research*, North-Holland, Amsterdam.

Krupp, Sherman Roy 1982, "Axioms of Economics and the Claim to Efficiency" in W. J. Samuels, ed., *The Methodology of Economic Thought: Critical Papers from the Journal of Economic Issues*, Transaction Books, New Brunswick, NJ.

Kudielka, Brigitte M., Dirk H. Hellhammer and Clemens Kirschbaum 2007, "Ten Years of Research with the Trier Social Stress Test – Revisited," in Eddie Harmon-Jones and Piotr Winkielman, eds., *Social Neuroscience: Integrating Biological and Psychological Explanations of Social Behavior*, The Guilford Press, New York, pp. 56-83.

Leontief, Wassily 1983, "Academic Economics," *Science*, Vol. 217, July 1982; reprinted as "Foreword" to Alfred S. Eichner, ed., *Why Economics is Not Yet a Science*, M.E. Sharpe, Armonk, NY.

Maslow, Abraham 1954, *Motivation and Personality*, Harper and Row, New York.

_____ 1968, *Toward a Psychology of Being*, Van Nostrand, New York.

McGregor, Douglas 1971, "Theory X and Theory Y," in *Organization Theory*, ed. D. S. Pugh, Penguin, NY.

Mueller, Dennis 1984, "Further Reflections on the Invisible-Hand Theorem" in P. Wiles and G. Routh, eds., *Economics in Disarray*, Basil Blackwell, Oxford.

Myrdal, Gunnar 1978, "Institutional Economics," *Journal of Economic Issues*, Vol. 12, No. 4, pp. 771-83.

Nelson, Richard R. 1981, "Research on Productivity Growth and Productivity Differences: Dead Ends and New Departures," *Journal of Economic Literature*, Vol. 19, No. 3, September, pp. 1029-64.

Norris, Catherine J. and John T. Cacioppo 2007, "I Know How You Feel: Social and Emotional Information Processing in the Brain," in Eddie Harmon-Jones and Piotr Winkielman, eds., *Social Neuroscience: Integrating Biological and Psychological Explanations of Social Behavior*, The Guilford Press, New York, pp. 84-105.

Pert, Candace B. 1997, *Molecules of Emotion: Why You Feel the Way You Feel*, Scribner, New York.

Peterson, Christopher and Edward C. Chang 2003, "Optimism and Flourishing" in Corey L.M. Keyes and Jonathan Haidt, eds., *Flourishing: Positive Psychology and the Life Well-Lived*, American Psychological Association, Washington, DC, pp. 55-79.

Rand, Ayn 1964, *The Virtue of Selfishness: A New Concept of Egoism*, New American Library, New York.

Richardson, G. B. 1959, "Equilibrium, Expectations and Information," *Economic Journal*, 69, June, pp. 223-37.

Rosenau, P. V. (2003) *The Competition Paradigm: America's Romance with Conflict, Contest, and Commerce*, Rowman and Littlefield, Lanham, MD.

Schachtel, Ernest G. 1959, *Metamorphosis*, Basic Books, New York.

Schulz, Theodore W. 1993, *Origins of Increasing Returns*, Blackwell Publishers, Cambridge, MA.

Seligman and Csikszentmihalyi 2000, "Positive Psychology: An Introduction," *American Psychologist*, Vol. 55, No. 1, pp. 5-14.

Selznick, P. 1948, "Foundations of the Theory of Organizations," *American Sociological Review*, Vol. 13, reprinted as ch. 13 of F. E. Emery, ed., *Systems Thinking*, Penguin (1969), Baltimore, MD.

Senge, Peter M. 1990, *The Fifth Discipline: The Art and Practice of the Learning Organization*, Doubleday/Currency, New York.

Simon, Herbert A. 1971, "Decision Making and Organizational Design," ch. 11 in D. S. Pugh, ed., *Organization Theory*, Penguin, New York.

_____ 1979, "Rational Decision Making in Business Organizations," *American Economic Review*, vol. 69, no. 4, pp. 493-513.

_____ 1981, *The Sciences of the Artificial*, 2nd ed., MIT Press, Cambridge, MA.

_____ 1982-97, *Models of Bounded Rationality, Vols. 1-3*, MIT Press, Cambridge.

Stigler, George J. 1951, "The Division of Labor is Limited by the Extent of the Market," *Journal of Political Economy*, Vol. 59, June, pp. 185-93; also ch. 10 in William Breit and Harold M. Hochman, ed., *Readings in Microeconomics, 2nd ed.*, Holt, Rinehart and Winston, New York, 1971, pp. 140-48.

Tannenbaum, Robert and Robert W. Hanna 1985, "Holding On, Letting Go, and Moving On: Understanding a Neglected Perspective on Change" in Tannenbaum, Margulies, Massarik and Associates, eds., *Human Systems Development: New Perspectives on People and Organizations*, Jossey-Bass, San Francisco.

Taylor, Shelley E. and Gian C. Gonzaga, "Affiliative Responses to Stress: A Social Neuroscience Model," in Eddie Harmon-Jones and Piotr Winkielman, eds., *Social Neuroscience: Integrating Biological and Psychological Explanations of Social Behavior*, The Guilford Press, New York, pp. 454-73.

Tomasino, Dana 2007, "The Psychophysiological Basis of Creativity and Intuition: Accessing 'The Zone' of Entrepreneurship," *International Journal of Entrepreneurship and Small Business*, Vol. 4, No. 5, pp. 528-42.

Uchino, Bert N., Julianne Holt-Lunstad, Darcxy Uno, Rebecca Campo, and Maija Reblin, "The Social Neuroscience of Relationships: An Examination of Health-Relevant Pathways," in Eddie Harmon-Jones and Piotr Winkielman, eds., *Social Neuroscience: Integrating Biological and Psychological Explanations of Social Behavior*, The Guilford Press, New York, pp. 474-92.

The Culture of Complementarity

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Center for Ecological Economic and Ethical Education
Monday, 5 January 2015

PRESENTATION OUTLINE

for
AFEE/ASE Session at ASSA Conference 2015, 2-5 January 2015, Boston, MA

I. Introduction

1. AIM: To portray what "a culture of complementarity" would look like
2. Summary of the case for complementarity and its horizonal elements
3. The institutional implications of substitution and complementarity: organizational management theory on higher-order need deprivation
4. Research in neuropsychology on the effects of a competitive culture: the human physiological and mental health effects of fear and stress; the horizonal aspects of positive vs. negative feelings in psychology
5. The process of cultural change: 'hanging on, letting go, moving on...'

II. The Case for Complementarity

1. Material goods (atoms): returns decreasing (s-r), increasing (l-r) which implies s-r substitution → l-r complementarity (Kaldor); this suggests the relevance and importance of horizonal aspects
2. Intangible goods (bits): increasing returns → complementarity (information, knowledge – higher order needs – complementary)
3. Planning horizons (wits): interhorizonal complementarity means the balance of interdependence in human relations is horizonal
4. Substitution vs. complementarity: conflicts vs. concerts of value imply a negative vs. positive correlation of human needs/wants
5. The implications of complementarity: if human needs are aligned in a positive way, then what would our social culture look like?

III. Institutional Implications

1. Substitution/independence vs. complementarity/interdependence
2. Transportation network case: both entangled/joined together, which yields an institutional dilemma (nondecomposable mix); which is the more efficient system? competition or cooperation?
3. Horizonal answer: longer/broader horizons are always better... → learning is complementary → cooperation lengthens horizons
4. Organizational management theory: authoritarian hierarchies → pathological symptoms of higher-order human need deprivation (materialism, myopia, selfishness, fragmentation, hostility, etc.)
5. This describes symptoms of organizational stress in our culture, caused by substitution/competition in complementary settings

IV. A Culture of Complementarity

1. Generalized complementarity (Kaldor) makes interests aligned, implies no conflict between helping you and helping myself…
2. Competition vs. cooperation; self vs. other; fear (threat) vs. love; either/or vs. both/neither → effects on human health and welfare
3. Human health tied to affinity and affiliation with social groups, while stress and isolation tied to poor mental and physical health
4. Neuropsychological research on positive vs. negative feelings: love tied to human flourishing and longer/broader horizons, while fear (stress) tied to human languishing and narrow minds
5. Competition is not only inefficient but also extremely unhealthy!

V. The Process of Cultural Change

1. Competition (fear/stress) leads to closed minds and dogmatism
2. Our best example of pure complementarity is in education…
3. The arrested development of economics is due to competition applied in a setting of complementarity where it doesn't belong
4. The painful process of 'holding on, letting go and moving on'
5. Substitution assumptions and competition are destroying our human, organizational and ecological health across the planet!
6. Recognizing complementarity → the efficiency of cooperation will lead to radical changes in economic methods and findings calling for realistic courage and determination for reformation

VI. Summary and Conclusions

1. Substitution is only a special (s-r) case → complementarity is the general character of economic and human relations
2. Competition is based on substitution and does not apply in any complementary setting: indeed, competition cannot but fail…
3. Pathological symptoms of organizational stress in our systems signal the failures of competition in creating a myopic culture
4. Competition is also destroying our mental and physical health
5. Competition (fear and stress) are leading to narrow horizons
6. Economists need to face this for effective cultural change…

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ORIGINAL FOUNDING AND MISSION STATEMENT
CENTER FOR ECOLOGICAL ECONOMIC AND ETHICAL EDUCATION

"No intellectual endeavor is more important to humanity today than the welding together of the disciplines of ecology and economics."
– Paul R. Ehrlich, Stanford University

The Center for Ecological Economic and Ethical Education seeks to develop, advance and nurture a better and broader understanding of our intellectual, institutional and individual impacts on our natural, social and cultural environments, through three complementary efforts:

(1) ***a program in ecological economics****, to promote the growing awareness among economists, and other relevant academics with economic concerns or interests, about the ongoing and dynamic interrelation of economics to ethics, social culture, and ecological issues;*

(2) ***a program in environmental education****, to promote public awareness of interdependent economic effects through specific examples of ecological loss from myopic decisions, especially in their relation to widespread social attitudes, regulations and institutions; and*

(3) ***a program for political and institutional change****, to press for a more sensible economics of public policy choice, especially on environmental issues (such as in fisheries management).*

The Problem of Interdependence. *We live in a dangerous age. Our every act ripples outward forever in consequential effect – through time, in nature, on others – regardless of anticipation. This is the way of irreversible, interdependent domains: our ranges of vision (or planning horizons) stand as our only protection against disastrous outcomes of choice. Sensitivity, understanding, ethics and knowledge cede to chaos, stupidity, ecological loss and systems failures, subverted by myopic concerns. Survival of future generations shudders in the balance.*

"Someone needs to do something!"

Ecological Economics. *Ecology and economics – despite their etymological links – speak in incommensurate tongues. Ecology analyzes openly interadaptive vital systems, while economists' static constructions shun our rational limits and (therewith) dynamic chaotic complexity. As 'externalities' spill from models of orthodox economics in quiet tsunamis of far-flung cost, economists stubbornly fight to defend their intellectual turf against truthful input and discourse. But a gradual merging of economics with ecology is underway, and it needs support.*

"Our mission is to encourage a more ecological economics."

Environmental Education. *We all ought to appreciate our impact on the environment; we alter it through every act. Combining economic and ecological education opens a door to social change. Liberty and democracy demand informed electoral choice. A collective failure to cope with the radiant outcomes of our decisions cannot deflect their imminent threat to welfare and democratic ideals. Our only hope is to understand environmental effects – in their relation to our institutions – and to work on changing ourselves. Examples surround us of our role in the frightening course of events, only averted by anticipation. A true love of learning will guide us.*

"Improving environmental awareness is central to our mission."

If you wish to help, please contact Fred Jennings at fbj@ceeee.org or visit: www.ceeee.org