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## **Hodgson, cumulative causation, and reflexive economic agents**

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**Abstract:** This paper examines Geoff Hodgson's interpretation of Veblen in agency-structure terms, and argues it produces a conception of reflexive economic agents. It then sets out an account of cumulative causation processes using this reflexive agent conception, modeling them as a two-part causal process, one part involving a linear causal relation and one part involving a circular causal relation. The paper compares the reflexive agent conception to the standard expected utility conception of economic agents, and argues that on a cumulative causation view of the world the completeness assumption essential to the standard view of rationality cannot be applied. The final discussion addresses the nature of the choice behavior of reflexive economic agents, using the thinking of Amartya Sen and Herbert Simon to frame how agents might approach choice in regard to each of the two different parts of cumulative causal processes, and closing with brief comments on behavioral economics' understanding of reference dependence and position adjustment.

**Keywords:** Hodgson, Veblen, cumulative causation, reflexive agents, completeness assumption

**JEL codes:** B41, B52, D01

## **1. Introduction**

Among Geoff Hodgson's many valuable contributions to institutionalist, evolutionary, and heterodox economics is his often-cited critique of methodological individualism. His own conception of individuals, which emphasizes the relations between individuals, and rejects the conventional atomistic individual interpretation, essentially represents individuals as evolving sets of habits, as reflects his commitment to Veblenian thinking and heterodox agency-structure reasoning. This paper draws on this critique and his evolving habit conception of individuals to lay out an account of what individuals must be in evolutionary settings that are explained in Veblenian cumulative causation terms. I characterize such agents as reflexive economic agents. The paper contrasts this type of agent with the standard expected utility agent conception, and argues that in a cumulative causation world the standard conception fails to explain choice behavior, its principle goal, whereas reflexive agent conceptions offers an adequate explanation of choice behavior appropriate to evolving worlds.

The second section of the paper discusses Hodgson's critique of methodological individualism, shows its links to his Veblenian thinking, and then shows how his evolving habit conception of individuals is one type of reflexive agent conception. The third section discusses Veblen's cumulative causation view, and emphasizes how it depends on understanding economic agents as reflexive. To make this argument, I set out an account of cumulative causation processes which models them as a two-part causal process, one part of which involves a linear causal relation and one part which involves a circular causal relation. The fourth section discusses the standard expected utility account of economic agents' choice behavior, and argues that on a cumulative causation view of the world the completeness assumption that is essential to the standard view of rationality cannot be applied. The fifth section turns to the choice behavior of reflexive economic agents, and briefly uses the thinking of Amartya Sen and Herbert Simon to frame how agents might approach choice in regard to each of the two different parts of cumulative causal processes. I argue that in their choices agents act directly on the linear part of these causal processes and also insure themselves in regard to the circular parts of these causal processes. In the sixth section, using behavioral economics' emphasis on reference-dependence, an interpretation of this two-part analysis of choice is provided in terms of the idea of position adjustment. In the seventh and last section, I conclude by commenting briefly on how this idea can be understood in identity

terms to give an ontological characterization of the reflexive agent conception employed in a Veblenian, structure-agency framework.

## **2. Hodgson on methodological individualism**

Hodgson's (2007) examination and critique of methodological individualism makes the simple but generally neglected point that the meaning of the term has never been precisely stated, and the idea is in fact ambiguous as to what it refers to. Does it refer to explanations that are made in terms of individuals alone, or does it refer to explanations that are made in terms of individuals plus relations between them? He argues that while proponents of methodological individualism clearly intend the term to refer to explanations in terms of individuals alone, in his view explanations in terms of individuals alone have never been successfully achieved, always leaving "a social and relational residual that is not reduced entirely to individual terms" (*Ibid.*, p. 224n). However, explanations in terms of individuals plus the relations between them are also explanations in terms of institutions and social structures. Why, then, should methodological individualist explanations even emphasize individuals in the exclusivist way they do. Indeed, why shouldn't a 'methodological institutionalism' emphasizing institutions and social structures be equally plausible methodological strategy?

Yet despite his commitment to institutionalist argument in economics, Hodgson instead follows Veblen in rejecting the idea that either individuals or institutions and social structures provide self-sufficient foundations for social science (Hodgson, 1998a). He argues that Veblen, in developing an evolutionary framework, insisted that both agency and structure are essential to social science explanation since his strategy was "to conceive of both agency and structure as a result of an evolutionary process" (p. 423). However, Hodgson also notes that Veblen never fully worked out this strategy with respect to agents and individuals. "While Veblen consistently regarded the human agent as purposeful, he never reconciled the notion of purposeful behaviour with mechanical causality" (p. 423n). Indeed, without even getting into what causality involves, if methodologically individuals are to be understood in terms of the relations between them, two problems arise. First, it is unclear how individuals understood in terms of the relations between them should even be thought to be relatively independent, and second, it is unclear why in an evolutionary world in which social relations continually change their individuality, if it can be explained, has any

enduringness or ontological stability.<sup>1</sup> Hodgson's way of addressing the first issue, why agents should even be thought to be relatively independent, follows Veblen in emphasizing the importance of habit explained as an acquired disposition: "habits affect our choices, and our past choices affect habits" (Hodgson, 2010, p. 1). That is, agents, whether individuals (also collections of individuals I would argue) acquire habits, or ways of acting in specific types of circumstances, and are consequently disposed to act as agents able to initiate events in accord with those habits when the appropriate circumstances re-occur. Thus agents are defined as sets of habits and a capacity to act on those habits. It follows, I suggest, that since agents differ in regard to the sets of habits they each have, they can then be seen as relatively independent, as required in an evolutionary agency-structure analysis. In effect, agents are defined as distinguishable sets of habits.

One thing that is especially valuable about this view – very much in keeping with Veblen's thinking – is its rejection of the subjectivist basis for defining individuals that the mainstream employs. Individuals are not separate collections of preferences (or desires for Veblen), a type of psychological phenomenon, but are rather distinguishable collections of a type of observable, objective phenomenon, namely, agents' different habitual ways of acting in the world. In fact, subjectivist conceptions of individuals, whether preferences or any other kinds of subjective characteristics, all employ circular explanations of individuality. In order for a set of preferences or some other set of subjective characteristics to pick out and individuate a single person, since that set obviously cannot refer to the preferences or subjective characteristics of other individuals, it can only refer to preferences that belong to the person to be individuated as a separate person. But it is circular and empty to say that what makes a person an individual is that they have only their *own* characteristics (cf. Davis, 2011, p. 8-9). In contrast, with objectivist individual conceptions such as Hodgson's habit conception, we survey the world, see that different sets of habits are clustered in different locations in the world, and then impute individual agency to those different habit clusters. There is nothing circular in this procedure. It has the virtue that it does not presuppose agents' individuality in order to 'explain' it but rather infers their individuality from what can be observed and explained in terms of how the world is organized – a 'bottom-up' *a posteriori* procedure

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<sup>1</sup> These two issues correspond to the two identity criteria for conceptions of individuals that I have previously employed: individuation and re-identification (Davis, 2011).

rather than ‘top-down’ *a priori* definitional procedure.<sup>2</sup>

The second issue regarding agency raised by Hodgson and Veblen’s view that “both agency and structure [are the] result of an evolutionary process” is of the ontological stability of agents. If individuals are distinguishable at any one time in virtue of their having different sets of habits, but their habits change over time, then it is unclear why they should be thought to be distinguishable agents in an enduring sense. This problem puts the entire agency-structure approach at risk, since agency would then seem to play an insignificant role in agency-structure interaction understood as a process – a concern that Hodgson notes was expressed in “Veblen’s critique of Marxism … prompted by its apparent over-emphasis on the structural determination of individual agency” (*Ibid.*). Intuitively speaking, the problem is that if agents are to have persistent effects on social structures, they themselves would need to persist in some manner, even while continually changing in their habits. Hodgson’s view, however, that individuals and other kinds of agents are sets of habits captures only part of what he sees as being involved in how people develop habits, and the further content of the idea tells us something about the ontological stability of agents. Thus, to say that our “habits affect our choices, and our past choices affect [our] habits” also makes evolutionary change directional and cumulative, as Veblen had emphasized. Agents’ different sets of habits, then, change in a path-dependent and somehow cumulative way, and this tells us that somehow agents also exhibit some kind of enduringness. Agents, accordingly, are not only defined as distinguishable sets of habits; they are also defined as distinguishable sets of habits that evolve in a cumulative manner. I see this idea as essential to an evolutionary conception of agents, which differs from mainstream subjectivist agent conceptions not only as objectivist but also in making evolutionary change central to the very idea of what an agent is.

However, the idea of agents as sets of distinguishable, cumulatively evolving sets of habits requires considerable unpacking if it is to be clear in meaning and be useful in agency-structure explanations. How, then, are we to explain how agents’ different sets of habits change in a path-dependent and cumulative way? I assume this requires we explain the

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<sup>2</sup> In my recent discussion of the circularity problem for subjectivist individual conceptions, I describe another example of successful, non-subjectivist individuation of agents in Ronald Coase’s treatment of firms as distinguishable sets of objectively observable real world phenomena, namely, different sets of non-market exchanges (Davis, 2011, p. 9). Two other objectivist individual conceptions I have discussed on other occasions are individuals as collections of capabilities (Davis, 2009) and individuals as collections of social identities (Davis, 2015b).

reflexive feedback process associated with action and habit formation which operates roughly as follows: how agents act affects their habit formation, which then feeds back on and affects how they subsequently act, which then feeds back on and affects their future habit formation, and so on and so on, such that agents' distinguishable sets of habits evolve in a path-dependent, cumulative manner. In this regard, a reflexive feedback process involving agents is a special type of causal process in which agents co-evolve as distinguishable, changing sets of habits together with cumulative change in social structures and institutions. I characterize this as one type of evolutionary agent conception, and in the following section discuss what a cumulative causation process involves in a Veblenian framework in order to explain how evolutionary agents are reflexive agents.

### **3. Veblen's cumulative causation view and reflexive agents**

In what way, then, are causal processes cumulative, or how can they be explained as building on themselves in a truly evolutionary way in which new causal relationship emerge from past ones? If we first think of causation solely in terms of individual causal sequences, the idea that a series of individual causal sequences can build on one another initially seems paradoxical. On the one hand it means that a given cause-and-effect sequence at any one point in time is somehow derived from an earlier, related cause-and-effect sequence, yet on the other hand it implies that the later cause-and-effect sequence is also different from the earlier one. That is, the cumulative causation idea somehow combines the concepts of continuity and non-identity of cause-and-effect sequences (cf. Davis, 2015a). How can this be understood? I argue this is where the agency side of agency-structure explanations is important since the action-habit characterization of agents that Hodgson employs provides a way of combining the continuity and non-identity of earlier and later causal sequences in such a way as to show how a series of individual causal processes can be seen to be cumulative. Let me be more specific, then, about what that this action-habit link involves.

For Hodgson, people's habits dispose them to act in certain ways, or their habits have causal effects on their actions, and then in a circular way their actions also influence their habits. That is, the disposition to act based on habit, an individual, linear cause-to-effect relationship, is coupled with a further effect that somehow revises habit as a basis for future action. Often the modeling of causal processes neglects this further, circular part of this process. In the basic linear representations of the causal relationship, some factor  $a$  acts on some other

factor  $b$ , or  $a \rightarrow b$ . But in the case of agents acting on the basis of habits, a circularity operates whereby the action of  $a$  on  $b$  also involves the causal relationship  $a \rightarrow b$  acting on itself. Given the event  $a$  and the  $a \rightarrow b$  causal relation, it is then also the case that  $a \rightarrow b \rightarrow (a \rightarrow b)$ . The combined overall effects ( $=>$ ), then, produce both  $b$  and  $(a \rightarrow b)'$ :

$$a \text{ and } a \rightarrow b \text{ and } a \rightarrow b \rightarrow (a \rightarrow b)' => b \text{ and } (a \rightarrow b)'. \quad [1]$$

The circular character of the process, then, specifically derives from the fact that the linear causal relation  $a \rightarrow b$  has causal effects on itself, which are additional to the linear effects that  $a$  has on  $b$ . The standard linear causal relationship that operates at the level of individual factors, that is, is connected to a further causal process that operates at the level of the causal relation itself.

From this perspective, it is not paradoxical to say in cases such as the habit-action model that cumulative causation processes combine continuity and non-identity of linear cause-and-effect sequences. Their non-identity is associated with the linear sequence part of the overall relation:

$$a \text{ and } a \rightarrow b => b \quad [2]$$

since there is nothing in this relation which refers to a changed  $(a \rightarrow b)'$ . Their continuity is associated with that part of the overall relation in which the linear sequence operates on itself:

$$a \rightarrow b \text{ and } a \rightarrow b \rightarrow (a \rightarrow b)' => (a \rightarrow b)' \quad [3]$$

since here the  $(a \rightarrow b)'$  outcome is a result of  $a \rightarrow b$  acting on itself. The full overall relation [1] combines [2] and [3], and thus shows how the  $a \rightarrow b$  relation builds on itself.<sup>3</sup>

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<sup>3</sup> Note that the flip side of this is that neither are the ideas of novelty and emergence paradoxical ideas, as might be argued if they are explained solely in terms of linear causation or on an *ex nihilo* basis (something out of nothing). Rather emergent and novel properties,  $(a \rightarrow b)'$ , derive in a circular way from known properties,  $a \rightarrow b$  when the effects of relationships on themselves are taken into account. They only appear to lack a basis in past relationships, or appear to originate *ex nihilo*, when  $(a \rightarrow b)'$  is mistakenly derived only from the simple linear action of  $a$  on  $b$ , giving the false impression that  $(a \rightarrow b)'$  has somehow mysteriously emerged in a direct, unmediated way from the causal relationship at the level of individual factors. I call this the *ex nihilo* fallacy in causal theory.

Consider agents then. Agents are disposed to act on the basis of their habits, so their habits work as causal factors influencing their actions as effects. This is the linear causal relationship operating at the level of individual factors. But their actions change the way in which their habits operate on their actions. This is the circular part of the overall causal process in which the habit-action causal relation acts on itself. In effect, then, the linear relationship is embedded in the overall relationship. From this perspective, we can understand why Veblen's emphasis on purpose in explaining agent behavior only goes part of the way toward explaining the nature of cumulative causation. Purpose, as a way of saying how action stems from habit, only describes the linear relationship in which  $a$  acts on  $b$ , or  $a \rightarrow b$ , and leaves out the circular reflexive feedback effects of how the  $a \rightarrow b$  relation acts on itself, or how  $a \rightarrow b$  produces  $(a \rightarrow b)'$ . That is, there is no account of how the agent's exercise of purpose is itself affected by its exercise.

I characterize the overall combination of linear and circular effects as a feedback relation. Often feedback is associated with a clearly reflexive sequence such as  $a \rightarrow b \rightarrow a$ . But this representation is an inadequate characterization of reflexivity, because  $a \rightarrow b \rightarrow a$  does not show that  $a$  has changed, which is the actual idea with feedback. In contrast, it is not unreasonable to say that the  $a \rightarrow b$  relation acts on itself, as when the exercise of the habit-action relation is said to act on itself. Indeed, reflexive relationships have long been explained as exhibiting a property called self-referentiality, or the idea of something 'reflecting or bending back upon itself' (cf. Sandri, 2009, pp. 6-8). Self-referentiality is perhaps more widely associated with semantics, e.g., the liar's paradox (Beal and Glanzberg, 2014), and with mathematics, e.g., Russell's set theory paradox, (Bolander, 2013), but it also plays an important role in the analysis of certain types of causal processes, particularly in connection with positive feedback relationships (e.g., Soros, 2013). Further, evolutionary explanations in the social sciences such as in the action-habit relationship parallel some evolutionary explanations in biology in which two-part causal processes have both individual effects and overall effects on the domain in which the process operates, such as the in analysis of causal relationships in ecosystems (cf. Huneman, 2014a and 2014b).

This all then also points toward another way in which the evolutionary habits conception of agents is superior to the mainstream subjectivist conception. The habits conception works through feedback effects from action onto habits, which then determines the basis for future action. The subjectivist preference conception rules out feedback effects from action onto its

subjectivist basis because it treats the subjectivist basis for action as exogenous and unchanging. So the causal process it involves can be neither circular nor self-referential. That is, it represents the causal process in a purely linear manner – a subjective factor  $a$ , the agent's preference, acts on a factor  $b$ , the agent's choice of action. This representation of causality may sometimes be useful as a rough approximation of choice behavior in a limited temporal frame, but becomes problematic for through-time characterizations of agent behavior. Part of the meaning of being an agent of course is of something that brings about change in something else. But a deeper agent conception – a reflexive agent conception – is the idea of an agent that brings about change by acting on something else and also acting on itself. In effect, then, the mainstream subjectivist agent conception models causal processes too narrowly, and fails to capture the circular, cumulative nature of social science processes that a reflexive agent conception can explain.

What I turn to in the next two sections, then, is the choice behavior of economic agents. My goal is to explain the nature of reflexive economic agents by comparison with the standard account of agents' choice behavior. The main difference concerns how reflexive agents form expectations about the future and anticipate the consequences of their actions. Since they can see that the consequences of their actions affect not only what their actions directly affect but also the action-target relationship they act on, they must be seen as operating with a cumulative causation model of the world, not the linear causation model that subjectivist agent conceptions employ. In effect, not only do reflexive agents target the effects of their actions but they also target the effects of their actions on their action-target strategies. First, however, consider what the standard account of choice behavior of economic agents involves.

#### **4. The standard account of choice behavior and the completeness assumption**

The standard subjectivist choice model, or the expected utility model, assumes that the agent's choice set, or the objects over which the agent chooses, is complete in the sense that all those objects are commensurable, or can be evaluated according to a common metric, so that the agent always prefers one object to another or is indifferent between them. However, if the choice set is incomplete, or not all the objects the agent encounters are comparable, then standard optimization analysis of choice fails (Sen, 1997). I argue, then, that on a Veblenian habit-action view, in which choice is understood in cumulative causation terms, agents' choice sets must be incomplete, and the standard choice model fails.

Following the discussion of the last section, consider how choice understood in cumulative causation terms would be modeled. First, given a set of prices and the agent's income, the agent's preference,  $a$ , acts causally on the object of the agent's choice,  $b$ , where  $b$  is in one possible object in the agent's choice set:

$$a \text{ and } a \rightarrow b \Rightarrow b. \quad [2]$$

Here [2] represents the linear part of the overall causal relationship as set out above. Second, what [2] disregards is the circular part of this overall relationship whereby  $a \rightarrow b$  acts on itself, or:

$$a \rightarrow b \text{ and } a \rightarrow b \rightarrow (a \rightarrow b)' \Rightarrow (a \rightarrow b)'. \quad [3]$$

Combining [2] and [3] gives the overall causal effect of the agent's preference on the expected object of choice:

$$a \text{ and } a \rightarrow b \text{ and } a \rightarrow b \rightarrow (a \rightarrow b)' \Rightarrow b \text{ and } (a \rightarrow b)'. \quad [1]$$

Here I suppose that  $(a \rightarrow b)' = a \rightarrow b'$  in order to capture the change in the relationship. Note, then, that the  $b$ 's on the right sides of expressions [2] and [1] are actually different objects of choice which differ according to whether the circular effects from [3] are included. So both  $b$ 's must be in the agent's choice set. Supposing that agents consider these circular effects, they must consequently compare the  $b$  in [2] with the  $b'$  in [3] in terms of some common metric. However, the  $b$  in [2] in the  $a \rightarrow b$  relationship cannot be compared with the  $b'$  as in [3] in the  $a \rightarrow b'$  relationship, because when the circular affects operate, that latter relationship replaces the former one. That is, when  $a \rightarrow b'$  obtains, we are in a different causal world than when  $a \rightarrow b$  obtains. Consequently these two  $b$  objects do not share a common metric, and thus the agent's choice set is incomplete.

It is important to be clear, then, about the basis for the completeness assumption and the meaning of comparability in the standard view. If a folk psychology understanding of choice is adopted, one might suppose that comparability is a matter of some human evaluative ability. If the agent believes two objects can be compared, then they can be. But this is a mistaken interpretation of the completeness assumption. Axiomatic rational choice theory

is rather formulated in set-theoretic terms, so that in regard to the completeness assumption when any two objects are compared, they must be members of a single set of objects. Moreover, that set of objects has its unity in virtue of there being at a given point in time one set of causal relationships which governs those objects. Comparability, that is, is not understood psychologically or perceptually in the sense of an agent's human ability or even willingness to compare any two random objects. Rather on the set-theoretic view of rational choice the agent can only compare objects that are defined to be members of the same set. Thus human abilities for comparing the objects of choice are irrelevant. Accordingly, on set-theoretic grounds, comparability fails in the case of expression [3]. Thus the completeness assumption and the standard view of choice cannot be used in cumulative causation explanations.<sup>4</sup>

## 5. The choice behavior of reflexive economic agents

How, then, are we to explain the choice behavior of reflexive economic agents in a cumulative causation world? A first step is to move from standard optimizing behavior to a more flexible characterization of behavior as merely maximizing on the assumption that, though the completeness assumption cannot be upheld, we can still represent agents as aiming to do as well as they can. Thus Sen has argued that non-commensurability, which fails for a number of reasons, precludes optimizing behavior, understood as requiring one-to-one comparisons between all choice options, but does not preclude maximizing behavior, understood as allowing comparisons of choice options that are incomplete or partial and yet still transitive (Sen, 1997). Maximizing behavior, that is, aims at ranges of alternatives not worse than all other accessible options, whereas optimizing behavior more demandingly aims at alternatives that are as good as all other accessible options.

Sen also likens maximizing behavior understood in this way to Simon's 'satisficing' behavior (Simon, 1982). Both Sen and Simon, it should be noted, have employed reflexive agent type conceptions not unlike Hodgson's action-habit model whereby agents not only make choices but also evaluate the basis on which they make choices. Sen explains this in terms of his "fourth aspect of the self" involving how agents examine their "own values and objectives and

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<sup>4</sup> It is also worth noting that the folk psychological interpretation of completeness is virtually empty of meaning in that this idea of comparability is so open-ended that there is likely no definitive way to determine whether any two objects can be compared in terms of some common metric. In effect, the folk psychological view is biased towards always assuming comparability. This is one reason in favor of the more rigorous set-theoretic approach.

choose in the light of those values and objectives" (Sen, 2002, p. 36). Simon explains this in terms of his 'ecological rationality' thinking whereby behavior is "shaped by a scissors whose two blades are the structure of task environments and the computational capabilities of the actor" (Simon 1990, p. 7), such that agents continually need to account for the environmental circumstances of choice.<sup>5</sup> If we then interpret Sen and Simon's views along the lines of the cumulative causation account of choice above, we can ascribe the reflexive aspect of behavior they emphasize to the circular part of the overall representation of cumulative causal processes, namely to [3]. That is, when agents make choices, they are not only concerned with their immediate object of choice but also with the choice-object relationship itself.

But how is this to be explained? As a first step, we can distinguish [2] and [3] in terms of their differing degrees of likelihood for the agent. The linear relation [2], then, presumably has a higher degree of probability than the circular relation [3]. That is, it seems fair to suppose that the exercise of the agent's preference,  $a$ , is more likely to bring about the object of the agent's choice,  $b$ , than is the action of  $a \rightarrow b$  on itself likely to bring about a change in that relationship and produce a  $(a \rightarrow b)'$ . Among the reasons to think this is the evidence from science that  $a \rightarrow b$  causal relations are relatively stable and evolve (when they do) slowly. Indeed without this sort of stability, science would be very difficult and less successful than it has been. I accordingly hypothesize that direct linear relations are more likely than indirect circular ones.<sup>6</sup>

I also hypothesize, then, that agents generally know this. At the same time, as reflexive agents they still know that their actions can have effects on their basis for action, or action can affect habit in the action-habit model, even if their main concern is the immediate effects of choice and action, or how acting on the basis of habit generates reliable outcomes. This shifts the issue to how agents integrate two different concerns in their choice behavior. In the section that follows, I address this issue in terms of two different ways that agents order and manage uncertainty, and characterize the overall behavior of reflexive economic agents in position/adjustment terms.

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<sup>5</sup> The 'ecological rationality' label has been attributed to Simon by others: "A [decision] heuristic is ecologically rational to the degree that it is adapted to the structure of the environment" (Gigerenzer *et al* 1999, p. 13).

<sup>6</sup> How much less likely the circular relation is presumably depends on agent interaction and the extent to which agents together re-evaluate the basis on which they act, as in herding behaviors.

## **6. Managing uncertainty: Position/adjustment behavior**

One way to approach this issue is in terms of how people have addressed an especially important unexpected event in the recent past. Thus, a key lesson from the 2007-2008 financial crisis was that rare events with significant undesirable consequences require strategies different in kind from common events with more modest undesirable consequences. Common events with more modest undesirable consequences are costly but are not catastrophic in the sense developed by Roy Radner (1997) that they may put the survival of the agent at risk.<sup>7</sup> Why purportedly rare events such as the 2007-2008 crisis occur more frequently than predicted, of course, has been subject to considerable debate, but one reason this can happen is that causal relationships may change as a result of what agents do, as in [3], so that what was previously rare in fact no longer is.<sup>8</sup> How, then, would agents address this possibility? Radner draws an important conclusion. He argues that when economic survival is the pre-eminent concern of the agent, standard utility optimization analysis is inadequate and must be set aside. Consequently, even though circumstances that put agents at extreme risk are not common, we may imagine that agents nonetheless prioritize addressing them, and then proceed to adjust their ordinary decision-making to these prior choices.

In effect, agents first insure themselves against catastrophic events that may have consequences for their survival. The idea of ‘survival’ can of course be taken different ways, but here is simply understood to refer to agents’ ability to maintain themselves as agents. In behavioral economic terms, they are ‘reference-dependent’ in that they aim to maintain whatever positions they occupy, and “the carriers of value are changes in wealth or welfare, rather than final states” (Kahneman and Tversky, 1979, p. 277). It follows that “losses loom larger than gains” (*Ibid.*, p. 279), or agents’ value functions are increasing in losses and diminishing in gains. In effect, following Simon, agents behave homeostatically, always acting reflexively to return themselves to a prior state, especially when they are in danger of losing ground and have modest interest in moving away from that state when there is the

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<sup>7</sup> Radner analyzes the classic ‘gambler’s ruin problem’ first investigated by Blaise Pascal and James Bernoulli. Vernon Smith uses Radner’s thinking regarding economic survival to develop his own views of ecological rationality (Smith, 2007, pp. 169ff).

<sup>8</sup> Another reason that puts aside the issue of change in causal relationships is that events are not normally distributed so that there are ‘fat tails’.

opportunity to do so. On this position/adjustment view, that is, agents are first and foremost reflexive agents.

Note, then, that agents' positions are only at risk in a cumulative causation world when their actions (together with the actions of others) have some probability of changing the causal relations they act on, as in [3]. Accordingly, as argued above, the standard completeness assumption fails, and their reference-dependent behavior cannot be explained in standard optimization terms. However, following Sen's arguments about non-commensurability and maximization, reflexive agents can aim to do the best they can, making comparisons of choice options that are incomplete or partial and yet still transitive. We might consequently say that reflexive agents are not just position/adjustment agents, but position/adjustment-minimizing agents, with minimizing replacing maximizing when agents are reference-dependent, or rather position-dependent.

This understanding, then, places a particular emphasis on Hodgson's evolving habits conception of agents. Hodgson's view is that the habit-action causal link feeds back on itself and influences the habits on which agents act. What the analysis of behavior above adds to this view with its emphasis on agents seeking to maintain their positions is an underlying inertia in how agents' habits evolve, as indeed is appropriate to a habits conception. As adjustment minimizing, agents are biased toward relying on the positions and habits they have. That is, the greater probability of the main habit-action causal relation, or [2], bulks larger in their world, though they remain reflexive agents aware of the further possibility that their actions will alter their habits.

## **7. Concluding comment on identity**

Ontologically speaking, reflexive agents in a Veblenian, structure-agency framework must be distinguishable and re-identifiable to count as enduring individual agents. I suggest, then, that both properties can be ascribed to such agents in connection with their nature as reflexive. Essentially, when agents act with an awareness of how their actions influence the basis on which they act, they distinguish themselves for themselves as individual agents. That is, reflexive behavior is self-individuating. At the same time, whether this is a property or indeed an enduring property of agents is contingent upon its exercise. Should agents largely conceive of the world as in [2], then they fail to be independent agents in real terms, where this is a matter of how the world works causally.

Neoclassical agents, of course, necessarily act according to [2] because what motivates their choices are given preferences which are by definition unaffected by their actions. Above I argued that the preference conception (and any subjective conception) of agents is circular since the basis for individuality – own preferences – presupposes individuality. In contrast, in a reflexive agent conception what agents' actions are and what they do determines their individuality. Self-reference, then, is not just a semantic or mathematical relationship. It is a real world relationship exhibited causally in human action, and individuality is thus a matter of how the world works.

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