

Dual Inheritance Theory, Contract Law, and Institutional Change - Towards the Co-evolution of Behavior and Institutions*

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A. Introduction

The various contributions to this theme issue are likely to have at least two (non-trivial) things in common. First, they aim to contribute to a research project on "Legal certainty for globalized exchange processes" and to the latter's attempts to explain the observed transformation "towards the transnationalization of commercial law, which is understood as a combination of the internationalization and privatization of the responsibility of the state for the production of the normative good of legal certainty for global commerce". Secondly, they aim to fulfill this task by making use of "evolutionary theory" or, as it was again expressed in the original conference announcement, by dealing with "a theoretical perspective that gives some substance to the meaning of the term "evolution" with regard to law, social organization, and the state". Since, as I will try to explain shortly, my own particular take on this - it would appear - relatively small set of commonalities involves more specifically the use of contemporary evolutionary approaches to human behavior. I must admit to having been surprised that no one else seemed to have much use for these approaches in their respective takes on the problems that united us in the conference from which this contribution stems. After all, what better use to make of a theory originating from biology than to elucidate the biological underpinnings of our behavior and its underlying psychological

* A provisional draft of this article was presented at "Law, the State, and Evolutionary Theory", Joint Conference Sfb 597 - Project A4: Transformations of Commercial Law, and The German Law Journal - Annual Conference, University of Bremen, 5 October 2007. I would like to thank the organizers for inviting me to a very stimulating gathering. I also want to thank the participants for their critical questions and remarks. The usual disclaimer applies.

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mechanisms as they relate to law and legally relevant phenomena? Perhaps some of the reasons for these at first sight, striking differences in opinion on which "evolutionary theory" to make use of, or what meaning to impinge upon the term "evolution" will become clearer in the pages that follow, offering ways in which eventually to combine them. Or perhaps the two things we had in common when we started out will be all there is left to look at in the end.

Whatever its outcome may be, this article is structured as follows. Section B aims to provide a summary overview of the different contemporary evolutionary approaches to human behavior, including, but not limited to, the approach known as dual inheritance theory. In section C, this particular approach is further elaborated upon in order to show how evolutionary analysis in law could benefit from incorporating it into its theoretical framework. This is further illustrated using examples of the field of contract law. After a digression into evolutionary economics and systems theory, and their respective possible relationships with dual inheritance theory, I investigate in section D what the latter, qua evolutionary theory, has to offer to the study of the transformations of commercial law that are of central concern to the research project giving rise to this theme issue. In guise of conclusion, I offer two take home messages to consider when attempting to make "evolutionary theory" fruitful for the study of law and legally relevant phenomena.

B. Evolutionary approaches to human behavior and dual inheritance theory

As will readily become apparent from the various contributions to this theme issue, "evolutionary theory" can mean many things, both on its own and in its relation to law and legal phenomena. This renders it necessary to pin down somewhat more precisely what I have in mind when using the words "evolutionary theory" in conjunction to the word "law".

For me, using the words "evolutionary theory" in conjunction to the word "law", or conducting what has been called evolutionary analysis in law,¹ means trying to find out what, if anything, contemporary evolutionary approaches to human *behavior* (and its underlying psychological mechanisms) could teach us with regard to law and legally relevant phenomena. In doing so, my approach could be regarded as inscribing itself, at least to some extent, in a tradition which, in recent times, and perhaps befitting for an article in a journal devoted to developments in German

¹ See Owen D. Jones, *Evolutionary Analysis in Law: An Introduction and Application to Child Abuse*, 75 NORTH CAROLINA LAW REVIEW 1117 (1997).

jurisprudence, can be traced back to Margaret Gruter's pioneering efforts to incorporate sociobiological thinking into legal analysis.² However, it needs to be emphasized at the onset that sociobiological thinking itself has, say, "evolved" into a much broader framework of different approaches than was the case for the "narrower" classical sociobiology of the late seventies and eighties of the previous century, on which these and similar pioneering efforts were indeed primarily based.

Of course, adding the adjective "evolutionary" to "legal analysis" can be used to confer other meanings as well. Indeed, not unlike what appears to be the case for the majority of the quite varied approaches to economics sometimes collectively referred to as "evolutionary economics", legal scholars perhaps more often than not look to evolutionary theory and related fields of enquiry in order to address the ways in which legal rules or even legal systems themselves change and evolve. I will come back to this later.

For now, let me start by briefly presenting the three major contemporary evolutionary approaches to human behavior, thereby aiming at providing what has been called a "guide to the perplexed"³ to the existing diversity of often competing theoretical frameworks. In a fairly recent and rather fair review of the field, Eric Alden Smith distinguishes between three major styles of evolutionary approaches to human behavior, namely evolutionary psychology, human behavioral ecology and dual inheritance theory.⁴ One could think of other, somewhat more detailed, classifications of the field under consideration,⁵ but for my introductory purposes here Smith's threefold division will do just fine.

² On which see, e.g., Monika Gruter Morhenn & Margaret Gruter, *The Evolution of Law and Biology*, in *EVOLUTIONARY APPROACHES IN THE BEHAVIORAL SCIENCES: TOWARD A BETTER UNDERSTANDING OF HUMAN NATURE (RESEARCH IN BIOPOLITICS 8)*, 119 (Steven A. Peterson & Albert Somit eds., 2001). See also MARGARET GRUTER, *DIE BEDEUTUNG DER VERHALTENSFORSCHUNG FÜR DIE RECHTSWISSENSCHAFT (SCHRIFTENREIHE ZUR RECHTSOZIOLOGIE UND RECHTSTATSACHENFORSCHUNG 36)* (1976); Margaret Gruter, *Soziobiologische Grundlagen der Effektivität des Rechts*, 11 *RECHTSTHEORIE* 96 (1980).

³ Eric A. Smith, Monique Borgerhoff Mulder & Kim Hill, *Controversies in the evolutionary social sciences: a guide for the perplexed*, 16 *TRENDS IN ECOLOGY & EVOLUTION* 128 (2001).

⁴ Eric Alden Smith, *Three Styles in the Evolutionary Analysis of Human Behavior*, in *ADAPTATION AND HUMAN BEHAVIOR: AN ANTHROPOLOGICAL PERSPECTIVE*, 27 (Lee Cronk, Napoleon Chagnon & William Irons eds., 2000). The following considerations are to a considerable extent based on this article.

⁵ See, 0, KEVIN N. LALAND & GILLIAN R. BROWN, *SENSE AND NONSENSE: EVOLUTIONARY PERSPECTIVES ON HUMAN BEHAVIOUR* (2002); Maria G. Janicki & Dennis L. Krebs, *Evolutionary Approaches to Culture*, in *HANDBOOK OF EVOLUTIONARY PSYCHOLOGY: IDEAS, ISSUES, AND APPLICATIONS*, 163 (Charles Crawford & Dennis L. Krebs eds., 1998). See also Monique Borgerhoff Mulder, Peter J. Richerson, Nancy W. Thornhill & Eckart Voland, *The Place of Behavioral Ecological Anthropology in Evolutionary Social Science*, in

The *first* major style, also currently perhaps the most popular or at least the most readily visible one, evolutionary psychology,⁶ holds that evolutionary explanations of human behavior need to refer to genetically evolved psychological mechanisms which can be traced back to features of our ancestral environment, the so-called "environment of evolutionary adaptedness". These highly specialized psychological mechanisms or "modules" are regarded as adaptations resulting from evolution by way of natural selection in the distant past. Given that our psychological mechanisms are adapted to this long bygone past, human behavior is expected to be subject to a considerable adaptive lag, frequently leading to maladaptive outcomes in our current environments. Moreover, more general mechanisms, involving "learning", "culture" or "rational choice", are deemed insufficiently domain-specific and modular to serve as plausible outcomes of the process of selection. Thus, evolutionary psychologists are highly skeptical towards what they call the "Standard Social Science Model", which allegedly entails a blank slate view of the human brain, allowing for a nearly infinite malleability of the behavior to which it gives rise. These views are reflected in the model of culture developed by two leading evolutionary psychologists, John Tooby and Leda Cosmides. They make a distinction between "metaculture", "evoked culture", and "epidemiological (or transmitted) culture". Whereas the latter refers to what most people intuitively would associate with the notion of culture, this is contrasted to cross-cultural universalities ("metaculture") and – to a lesser extent – differences triggered by the environment ("evoked culture") in order to highlight their asserted neglect in the "Standard Social Science Model".⁷

According to the *second* approach, human behavioral ecology,⁸ humans are capable of rapid and adaptive phenotypic changes. Put differently, human behavior is characterized by a considerable degree of flexibility. Hence, according to human behavioral ecologists, it is likely that we are overall well adapted to our current

HUMAN BY NATURE: BETWEEN BIOLOGY AND THE SOCIAL SCIENCES, 253 (Peter Weingart, Sandra D. Mitchell, Peter J. Richerson & Sabine Maasen eds., 1997).

⁶ See, e.g., THE ADAPTED MIND: EVOLUTIONARY PSYCHOLOGY AND THE GENERATION OF CULTURE (Jerome H. Barkow, Leda Cosmides & John Tooby eds., 1992); THE HANDBOOK OF EVOLUTIONARY PSYCHOLOGY (David M. Buss ed., 2005).

⁷ For more extensive characterizations, see John Tooby & Leda Cosmides, *The Psychological Foundations of Culture*, in THE ADAPTED MIND: EVOLUTIONARY PSYCHOLOGY AND THE GENERATION OF CULTURE, 19, 88-93 and 114-122 (Jerome H. Barkow, Leda Cosmides & John Tooby eds., 1992).

⁸ See, e.g., Bruce Winterhalder & Eric Alden Smith, *Analyzing Adaptive Strategies: Human Behavioral Ecology at Twenty-Five*, 9 EVOLUTIONARY ANTHROPOLOGY 51 (2000); ADAPTATION AND HUMAN BEHAVIOR: AN ANTHROPOLOGICAL PERSPECTIVE (Lee Cronk, Napoleon Chagnon & William Irons eds., 2000).

environments.⁹ Existing diversity in human behavior would then largely be the result of different contemporary socio-ecological conditions eliciting different conditional behavioral strategies (framed in the form of "if context X, then perform A; if context Y, then perform B"). In order to study these behavioral strategies, human behavioral ecologists then for instance construct optimality models and analyze the trade-offs an individual faces in (consciously or unconsciously) deciding upon which strategy to use in a given situation.

The *third* and final approach concerns the proponents of dual inheritance theory who,¹⁰ like Robert Boyd and Peter Richerson, consider culture to be a whole of ideas, values, knowledge, and the like that is learned and socially transmitted between individuals. Since cultural information exhibits the characteristics required for evolution by way of natural selection – namely variation, retention and selection, they argue that Darwinian *methods* can in principle be used to analyze cultural evolution, important differences between biological evolution and cultural evolution notwithstanding. According to Linnda Caporael, "Boyd and Richerson propose a theory of forces to describe the Darwinian evolution of cultural creatures. Some of the forces are random, analogs of genetic drift and mutation; others are the outcome of individual decision making and choice, and finally, there is natural selection of cultural variation".¹¹ Which cultural variants an individual adopts is sometimes, but by no means always, a function of genetically evolved psychological mechanisms. Indeed, Boyd and Richerson and their collaborators have spent a lot of time modeling the evolution of so-called decision-making forces in cultural evolution. They plausibly argue that learning biases are an important force in cultural evolution, including, for instance, a frequency-based conformity bias ("do what successful individuals in the population are doing") and a model-based prestige bias ("do what the majority of the population is doing"). Besides investigating the ways in which genetic evolution could give rise to cultural capacities and how these cultural capacities affect cultural evolution, dual inheritance theorists also address the interactions between the cultural and the genetic system of inheritance. This aspect of their theoretical framework is often referred to as gene-culture co-evolutionary theory, and aims at elucidating the

⁹ See also, e.g., Kevin N. Laland & Gillian R. Brown, *Niche Construction, Human Behavior, and the Adaptive-Lag Hypothesis*, 15 *EVOLUTIONARY ANTHROPOLOGY* 95 (2006).

¹⁰ See, e.g., PETER J. RICHERSON & ROBERT BOYD, *NOT BY GENES ALONE: HOW CULTURE TRANSFORMED HUMAN EVOLUTION* (2005); Joseph Henrich & Richard McElreath, *Dual-inheritance theory: the evolution of human cultural capacities and cultural evolution*, in *OXFORD HANDBOOK OF EVOLUTIONARY PSYCHOLOGY*, 555 (R.I.M. Dunbar & Louise Barrett eds., 2007).

¹¹ Linnda R. Caporael, *Evolutionary Psychology: Toward a Unifying Theory and a Hybrid Science*, 52 *ANNUAL REVIEW OF PSYCHOLOGY* 607, 615 (2001).

complex feedback relationships between these two inheritance systems. Since dual inheritance theory will be in the center of attention throughout the remainder of this article, I think it is useful to complete my sketch of some of its important features with another rendering by two former students of Boyd and Richerson whose work has been very helpful to me in trying to connect this particular evolutionary theoretical framework to the study of law and legally relevant phenomena. According to Joseph Henrich and Richard McElreath:

"Culture, cultural learning and cultural evolution arise from genetically evolved psychological adaptations for acquiring ideas, beliefs, values, practices, mental models, and strategies from other individuals by observation and inference. Thus, the first step is to use the logic of natural selection to theorize about the evolution and operation of our cultural learning capacities.

(...) Our cultural learning mechanisms give rise to a robust second system of inheritance (cultural evolution) that operates by different transmission rules than genetic inheritance, and can thus produce phenomena not observed in other, less cultural, species. Theorizing about this process requires taking what we know about human cultural learning and human cognition, embedding these into evolutionary models that included social interaction, and studying the emergent properties of these models. This approach allows researchers to cobble up from psychology and individual decision-making to sociology and population-level phenomena."¹²

(I'll assume for now that these last two sentences should spark at the very least some interest with those interested in the topic central to this theme issue, but will further discuss their relevance in section D.I. of this article.)

It goes without saying that there are many different ways in which to contrast and compare these three different approaches, and I will not attempt to provide a full overview here, if only for the very simple reason that I obviously haven't been able to treat all of them as fully as they doubtlessly would deserve in their own right. I just want to draw attention to three possible ways of distinguishing between them.¹³ One way would be to distinguish between them on the basis of the

¹² Henrich & McElreath, *supra* note 10, 556.

¹³ See generally LALAND & BROWN, *supra* note 5, 287-318; Smith, *supra* note 4, 33-39.

importance they attach to (individual and/or social) learning.¹⁴ Evolutionary psychologists would then most likely argue that people are predisposed to learn what once was adapted, human behavioral ecologists would preferably contend that humans preferentially learn what currently is adaptive, whereas dual inheritance theorists in most cases would envisage a much larger role for a quite varied array of social learning mechanisms with regard to cultural information, capable of leading to adaptive as well as maladaptive outcomes.

Another way would be to try to map these approaches onto the evolutionary psychologists' threefold division of the concept of culture. Dual inheritance theorists could then be regarded as studying "epidemiological (or transmitted) culture", human behavioral ecologists as (mainly) investigating "evoked culture", and evolutionary psychologists themselves as (primarily) addressing "metaculture". Finally, the timescales of interest would seem to differ between the three approaches. Human behavioral ecology could be seen as focusing on short-term (behavioral) change and evolutionary psychology on long-term (genetic) change, which would leave dual inheritance theory – perhaps not very surprisingly – as occupying an intermediate timescale.¹⁵ Notwithstanding these (and other) important differences, it should be emphasized that most commentators within the field at the same time acknowledge the existence of not only points of agreement, but also important complementarities, and have not given up the hope that these diverse approaches will somehow be able to converge in the not too distant future, culminating perhaps in what has been called "evolutionary psychology in the round",¹⁶ as opposed to the "narrower" brand of evolutionary psychology discussed earlier.¹⁷

Nevertheless, when we ask ourselves the question as to how these different contemporary evolutionary approaches to human behavior have managed to make their appearance in evolutionary analysis in law in the sense given above, I think it

¹⁴ See also Mark V. Flinn, *Culture and the Evolution of Social Learning*, 18 *EVOLUTION AND HUMAN BEHAVIOR* 23 (1997).

¹⁵ Interesting parallels can be drawn with Peter M. Hejl, *Konstruktivismus und Universalien – eine Verbindung contre nature?*, in *UNIVERSALIEN UND KONSTRUKTIVISMUS*, 7, especially 21, 30-31 and 49 (Peter M. Hejl ed., 2001). Compare also, e.g., Larry Arnhart, *The behavioral sciences are historical sciences of emergent complexity*, 30 *BEHAVIORAL AND BRAIN SCIENCES* 18 (2007).

¹⁶ See Robin Dunbar & Louise Barrett, *Evolutionary psychology in the round*, in *OXFORD HANDBOOK OF EVOLUTIONARY PSYCHOLOGY*, 3 (R.I.M. Dunbar & Louise Barrett eds., 2007).

¹⁷ For the use of the term "narrow", see, e.g., David Sloan Wilson, *Evolution, Morality and Human Potential*, in *EVOLUTIONARY PSYCHOLOGY: ALTERNATIVE APPROACHES*, 55, 57-60 (Steven J. Scher & Frederick Rauscher eds., 2003); Matteo Mameli, *Evolution and psychology in philosophical perspective*, in *OXFORD HANDBOOK OF EVOLUTIONARY PSYCHOLOGY*, 21, 25-27 (R.I.M. Dunbar & Louise Barrett eds., 2007).

is fair to say that the latter approach has been marked by a rather clear preference for the more "narrow" kind of evolutionary psychological reasoning and for the relatively "classical" sociobiology on which the latter is often based.¹⁸ This will readily become clear when we take a closer look at the work of Owen Jones, one of the main proponents of evolutionary analysis in law,¹⁹ bearing in mind, however, that the following observations merely represent my own way of connecting some, but by no means all of the key elements of this author's approach to evolutionary analysis in law with their evolutionary psychological counterparts we've encountered earlier. For instance, according to Jones, "the legal features of any legal system will reflect not only the sifting and sorting of social and economic processes that lead to legal change, but will also reflect specific features of evolved, species-typical, human brain design".²⁰ This assertion can indeed be seen as reflecting "narrow" evolutionary psychology's preponderance towards finding a "metacultural" universal human nature. Similarly, evolutionary psychology's reverting to the "environment of evolutionary adaptedness" and the related adaptive lag hypothesis are present and accounted for in the treatment of behavioral law and economics' (seemingly) irrational behavior, as well as in the discussion of ways to assess the effectiveness of legal interventions.²¹

As has been pointed out by others,²² the problem with these views is not that they are necessarily incorrect, but that they are as incomplete, be it in a different way, as the views they are seeking to amend. Hence, in the next section, using the example of contracts and their regulation – legal or otherwise, I will try to show why evolutionary analysis in law would do well to enlarge its perspective by consistently incorporating dual inheritance theory into its theoretical framework,

¹⁸ See more extensively Bart Du Laing, *Evolutionary Analysis in Law and the Theory and Practice of Legislation*, 1 LEGISPRUDENCE: INTERNATIONAL JOURNAL FOR THE STUDY OF LEGISLATION 327, 329-343 (2007).

¹⁹ See, e.g., Owen D. Jones, *Evolutionary Psychology and the Law*, in THE HANDBOOK OF EVOLUTIONARY PSYCHOLOGY, 953 (David M. Buss ed., 2005); Owen D. Jones, *Law, evolution and the brain: applications and open questions*, 359 PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY OF LONDON B BIOLOGICAL SCIENCES 1697 (2004); Owen D. Jones & Timothy H. Goldsmith, *Law and Behavioral Biology*, 105 COLUMBIA LAW REVIEW 405 (2005).

²⁰ Owen D. Jones, *Proprioception, Non-Law, and Biolegal History*, 53 FLORIDA LAW REVIEW 831, 858 (2001).

²¹ See Owen D. Jones, *Time-Shifted Rationality and the Law of Law's Leverage: Behavioral Economics Meets Behavioral Biology*, 95 NORTHWESTERN UNIVERSITY LAW REVIEW 1141 (2001).

²² See, e.g., David Sloan Wilson, *Tasty Slice – But Where Is the Rest of the Pie?* (Book Review David M. Buss, *Evolutionary Psychology: The New Science of the Mind*), 20 EVOLUTION AND HUMAN BEHAVIOR 279 (1999); Herbert Gintis, *Book Review David J. Buller, Adapting Minds: Evolutionary Psychology and the Persistent Quest for Human Nature*, 9 JOURNAL OF BIOECONOMICS 191 (2007).

thereby most likely considerably strengthening and broadening its explanatory scope.

C. Dual inheritance theory and contract law

In previous work on evolutionary analysis in law,²³ I argued that, in order to make contemporary evolutionary approaches to human behavior fruitful for legal analysis, it would be necessary to be able to fulfill at least *two* requirements. *First*, we have to be able to give a plausible evolutionary account for *both* the behavior that is supposed to be regulated *and* what could be referred to as the regulating behavior itself. *Secondly*, rather than focusing exclusively on the – indeed not all that unlikely – universal aspects of the regulated behavior, this universality has to be connected more explicitly with the – cultural – diversity encountered in the world's legal systems. I will deal with these two requirements successively and show how they are intimately connected *not only* to each other, *but also* to the larger evolutionary framework of dual inheritance theory. In each case, I will clarify my position by referring to examples from the legal field of contract law – which, incidentally, will also lead us a few steps closer to the research project that is central to this theme issue.

I. Regulated behavior and regulating behavior

First, evolutionary analysis in law has to take into account the regulating behavior itself. After all, law not only *affects* human behavior, it also, in a way, *is* human behavior. What does this have to do with dual inheritance theory? Well, one way of approaching legal systems or systems of rules in general – but perhaps a very different way than the ones preferred by other "evolutionary" approaches to law – is to regard them as manifestations of large-scale cooperative behavior involving the production of a public good.

²³ See Bart Du Laing, *Equality in Exchange Revisited – From an Evolutionary (Genetic and Cultural) Point of View, to appear in LAW, MIND, AND BRAIN* (Michael Freeman & Oliver Goodenough eds., 2008) (available at: <http://ssrn.com/abstract=1030395>). For a more extensive discussion of the issues treated in this section, the reader is referred to this article.

An important part of Boyd and Richerson's work that I failed to mention earlier concerns finding an evolutionary explanation for the human propensity to cooperate in large groups of unrelated individuals.²⁴ Indeed, from the mathematical models associated with dual inheritance theory, it appears that (traditional) reciprocity-based solutions to cooperative dilemmas cannot easily be extended beyond rather small groups of individuals. Perhaps more importantly, it is also shown that culture, understood as shared information, can greatly enhance the scope of cooperation. More specifically, a combination of the biased cultural transmission mechanisms we've encountered earlier with what is called moralistic punishment can lead to the adoption of a wide variety of possibly individually costly social norms in a population.²⁵ According to Joseph and Natalie Henrich:

"When both adherence to a norm and a willingness to punish norm violations are influenced by cultural learning, the mechanisms of prestige-biased and conformist transmission can lead to stable situations in which most people acquire and follow the rules, prescriptions and punishments associated with a social norm. This applies to any norm, be it adaptive, neutral or maladaptive, and includes norms for costly cooperation."²⁶

So from this point of view one could say that culture appears more as a part of the solution than as a part of the problem. I strongly believe that this emphasis on a plausible evolutionary theory of social norms and institutions is of particular relevance for an evolutionary analysis in law aiming at incorporating regulating behavior in its analyses.

For instance, when relating evolutionary theory to contracts and contract law, I think it can be very useful to distinguish the behavior supposed to be regulated

²⁴ See generally RICHERSON & BOYD, *supra* note 10; Robert Boyd & Peter J. Richerson, *Solving the Puzzle of Human Cooperation*, in EVOLUTION AND CULTURE, 105 (Stephen C. Levinson & Pierre Jaisson eds., 2006); Peter J. Richerson, Robert T. Boyd & Joseph Henrich, *Cultural Evolution of Human Cooperation*, in GENETIC AND CULTURAL EVOLUTION OF COOPERATION, 357 (Peter Hammerstein ed., 2003); NATALIE HENRICH & JOSEPH HENRICH, WHY HUMANS COOPERATE: A CULTURAL AND EVOLUTIONARY EXPLANATION (2007).

²⁵ On the element of "moralistic punishment" see (and compare) also, from various angles, Chandra Sekhar Sripada, *Punishment and the strategic structure of moral systems*, 20 BIOLOGY AND PHILOSOPHY 767 (2005); Oleg Smirnov, *Altruistic Punishment in Politics and Life Sciences: Climbing the Same Mountain in Theory and Practice*, 5 PERSPECTIVES ON POLITICS 489 (2007); Karl Sigmund, *Punish or perish? Retaliation and collaboration among humans*, 22 TRENDS IN ECOLOGY AND EVOLUTION 593 (2007).

²⁶ Joseph Henrich & Natalie Henrich, *Culture, evolution and the puzzle of human cooperation*, 7 COGNITIVE SYSTEMS RESEARCH 220, 239 (2006).

from the behavior *by which* it is regulated. Contracting behavior itself can be seen – at least in its archetypical case – as an instance of small-scale dyadic cooperative behavior. A lot about contracts thus is likely to be adequately explained from an evolutionary point of view on the basis of reciprocal altruism and the mechanisms that are known to sustain it in dyadic interactions.²⁷ For example, this could be the case for so-called "relational contracts" and the fact that they are largely self-regulating. Here evolutionary theory could be seen as helping to determinate the relative importance of law, a suggestion that was also made by Thomas Ulen in a reaction to the article by Owen Jones from which I've quoted previously.²⁸ The different norms regulating contracts, however, often bear more resemblance to large-scale n-person forms of cooperative behavior. To account for these norms themselves, as well as for their variety, I think we will need an evolutionary approach to human behavior that fully incorporates human cultural capacities.

II. Universality and (cultural) diversity

Secondly, dual inheritance theory also provides a suitable evolutionary point of entry to the problem of reconciling legal universality and legal diversity. Indeed, I am convinced that evolutionary analysis in law, as it stands, has a lot to gain from explicitly taking into account cultural diversity.

We have seen that moralistic punishment combined with biased cultural transmission can sustain an arbitrarily wide variety of social norms in a population.²⁹ Hence, we face what is known as an equilibrium selection problem. Cultural group selection offers one mechanism capable of selecting among various costly social norms that can lead to different pro-social or cooperative social norms. Again in the Henrichs' formulation:

²⁷ On this reciprocal altruism see, e.g., Robert Trivers, *Reciprocal altruism: 30 years later*, in COOPERATION IN PRIMATES AND HUMANS: MECHANISMS AND EVOLUTION, 67 (Peter M. Kappeler & Carel P. van Schaik eds., 2006).

²⁸ See Thomas S. Ulen, *Evolution, Human Behavior, and Law: A Response to Owen Jones's Dunwoody Lecture*, 53 FLORIDA LAW REVIEW 931, 941-943 (2001).

²⁹ Arguably, this combination also appears to leave ample room for what could be called a measure of "violent arbitrariness" in normative systems, and has elsewhere, if I understood the argument correctly, been referred to as the "arbitrariness, inconsistencies, antinomies, paradoxes and even violence" that "lie at the bottom of the most refined constructs in economic and legal action" and of which "rational choice, games theory and decision theory" apparently would be unable to account. See namely Gunther Teubner, *Economics of Gift – Positivity of Justice: The Mutual Paranoia of Jacques Derrida and Niklas Luhmann*, 18 THEORY, CULTURE & SOCIETY 29, 29-30 (2001). See also, *infra*, section D.I.

"while neutral and somewhat maladaptive norms could be maintained *within* any particular group, group beneficial norms can spread by competition and selection *across* social groups that have different culturally evolved norms that vary in their group-beneficial properties – a process termed *cultural group selection*."³⁰

This approach clearly has the potential of providing additional insights into how similar problems are solved differently in various legal systems or systems of rules, with, for instance, varying degrees of cooperativeness as a result.

To illustrate this further, I would like to take a closer look at the issue of equality or substantive fairness in exchange transactions. In his survey of legal anthropological literature on exchange in pre-commercial societies, James Gordley made the general observation that

"(t)he rules or standards that govern personalized transactions are shaped by the fact that every party is a repeat player in a series of transactions. One consequence is that these standards need not ensure that every single transaction is fair; they may ensure that the series of transactions is fair".³¹

Again, this phenomenon could be related quite easily to reciprocal altruism – which is central to classical sociobiological and "narrow" evolutionary psychological explanations for the phenomenon of cooperation. Modern western contract theory, however, manifests a considerable tendency to expect mutual performances in isolated exchanges to be more or less equal, or substantively fair. This large-scale pro-social fairness norm, as it is expressed in the law regarding contracts, appears to be explained better by dual inheritance theory. Furthermore, it seems to resonate quite well with the cross-cultural data obtained from conducting economic experiments, even though I am aware of the controversies surrounding these findings and their interpretation. Indeed, some behaviorally inclined economists, like Herbert Gintis and Ernst Fehr, use the concept of "strong reciprocity" to refer to "a predisposition to cooperate with others and to punish those who violate the norms of cooperation, at personal cost, even when it is implausible to expect that

³⁰ Henrich & Henrich, *supra* note 26, 239.

³¹ JAMES GORDLEY, CONTRACT IN PRE-COMMERCIAL SOCIETIES AND IN WESTERN HISTORY (INTERNATIONAL ENCYCLOPEDIA OF COMPARATIVE LAW, VII/2, CONTRACTS IN GENERAL), 4 (1997).

these costs will be repaid by others or at a later date".³² This other-regarding type of predisposition appears difficult to explain without making appeal to a dual inheritance theoretical framework, resulting in something like Boyd and Richerson's so-called "tribal social instincts".³³ Moreover, as predicted by the dual inheritance theoretical framework within which at least some of this research is explicitly situated, cross-cultural differences in "strong reciprocity" appear largely correlated with group-level differences, rather than with individual-level differences.³⁴

Let me offer an intermediary conclusion for this section. I believe that "narrow" evolutionary psychology is not at all unlikely to provide us with valuable insights regarding universal aspects of individual human behavior, which may be useful in legal analysis. Put differently, just as one needs a plausible theory of universals to address diversity,³⁵ gaining knowledge of what elements of human psychology are likely to remain constant on relatively short timescales could affect our understanding of institutions and institutional change on these relatively short timescales. Dual inheritance theory, however, is especially likely to provide us with indispensable additional evolutionary theoretical building blocks to relate individual behavior and group-level phenomena like norms and institutions with one another.

Interestingly enough, quite a few of the topics associated with the problems of fairness and legal certainty as they manifest themselves when taking into account what has been called the transnationalization of commercial law, could quite easily be related, at least to a certain extent, to the problem of cooperation that was central to this section. This brings us then, finally, to the issues that were actually at hand in the conference from which the articles in this theme issue originate. I will start by offering some perhaps rather tentative points of comparison between, on the one

³² Herbert Gintis, Samuel Bowles, Robert Boyd & Ernst Fehr, *Explaining altruistic behavior in humans*, 24 *EVOLUTION AND HUMAN BEHAVIOR* 153, 154 (2003). See also Ernst Fehr & Urs Fischbacher, *Human Altruism - Proximate Patterns and Evolutionary Origins*, 27 *ANALYSE & KRITIK* 6 (2005).

³³ On which see Peter J. Richerson & Robert Boyd, *The Evolution of Subjective Commitment to Groups: A Tribal Instincts Hypothesis*, in *EVOLUTION AND THE CAPACITY FOR COMMITMENT*, 186 (Randolph M. Nesse ed., 2001).

³⁴ See Joseph Henrich, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr, Herbert Gintis, Richard McElreath, Michael Alvard, Abigail Barr, Jean Ensminger, Natalie Smith Henrich, Kim Hill, Francisco Gil-White, Michael Gurven, Frank W. Marlowe, John Q. Patton & David Tracer, "Economic Man" in cross-cultural perspective: Behavioral experiments in 15 small-scale societies, 28 *BEHAVIORAL AND BRAIN SCIENCES* 795 (2005) (and the discussion following the main article).

³⁵ See also Jerome H. Barkow, *Universalien und evolutionäre Psychologie*, in *UNIVERSALIEN UND KONSTRUKTIVISMUS*, 126 (Peter M. Hejl ed., 2001).

hand, dual inheritance theory as one of the currently prevailing evolutionary approaches to human behavior and, on the other hand, the perhaps equally diverse fields of evolutionary economics and systems theory. I will then focus on what dual inheritance theory more specifically has to offer to the study of the transnationalization of commercial law.

D. Institutional change: Towards the co-evolution of behavior and institutions

I. Tentative digressions into evolutionary economics and systems theory

In order to assess to what extent contemporary evolutionary approaches to human behavior in general, and dual inheritance theory in particular, could further our understanding of the phenomenon of transnationalization of commercial law, or certain parts pertaining to it, it might prove useful to start by offering some points of comparison between them and other theoretical frameworks sailing under the relatively broad "evolutionary" banner. This brings us right back to the beginning of this article, where I noted that there are many ways in which to use the words "evolutionary theory" in conjunction to the word "law", and consequently promised to return to the tendency of quite a few legal scholars to look to evolutionary theory and related fields of enquiry in order to address the ways in which legal rules or even legal systems themselves change and evolve. At the same time, this will allow me to discuss in a more general fashion how dual inheritance theory and related evolutionary frameworks can inform studies of institutional change, like the one the contributors to this theme issue were asked to comment on from their respective evolutionary perspectives.

1. Evolutionary economics

Let us start with evolutionary economics. As is the case for legal scholars drawing upon evolutionary theory, evolutionary economists differ greatly in their respective views on the "proper" use of evolution in economic theorizing. A very interesting way to look at these and similar issues – in economics that is, but much the same could apply for law, if only the possible analogue legal discussion had already reached the same level of advancement – is provided by the philosopher Jack Vromen. In order to lay bare the bones of contention separating different approaches to evolutionary economics from one another, Vromen distinguishes between three clusters of related but distinct issues,³⁶ namely (1) the issue of

³⁶ See Jack Vromen, *Conjectural revisionary economic ontology: Outline of an ambitious research agenda for evolutionary economics*, 11 JOURNAL OF ECONOMIC METHODOLOGY 213, 222-233 (2004). See also Jack

universal (or generalized) Darwinism – often associated with, *e.g.*, the work of Geoffrey Hodgson and Thorbjørn Knudsen,³⁷ (2) the issue of continuity between genetic and socio-cultural evolution – often associated with, *e.g.*, the work of Ulrich Witt and Christian Cordes,³⁸ and (3) the issue of (the relationships between different) levels of organization – on which various authors have commented from a variety of angles.³⁹

I find it useful to give Vromen's own characterizations of these issues in full, bearing in mind however that we will likely want to replace "economic" with "legal" where applicable:

"I. *The 'biological metaphor' and Universal Darwinism* – There are processes of economic evolution going on that exhibit the same essential abstract features as Darwinian evolutionary processes in biology."⁴⁰

"II. *The Continuity Thesis* – Prior non-economic evolutionary processes made ongoing economic evolutionary processes possible. Furthermore, outcomes of prior non-economic evolutionary processes and concurrently ongoing non-economic evolutionary processes still affect ongoing economic evolutionary processes."⁴¹

Vromen, *Generalized Darwinism in Evolutionary Economics: The Devil is in the Details*, MPI JENA PAPERS ON ECONOMICS AND EVOLUTION # 0711 (2007).

³⁷ See, *e.g.*, Geoffrey M. Hodgson & Thorbjørn Knudsen, *Why we need a generalized Darwinism, and why generalized Darwinism is not enough*, 61 JOURNAL OF ECONOMIC BEHAVIOR & ORGANIZATION 1 (2006).

³⁸ See, *e.g.*, Ulrich Witt, *On the proper interpretation of 'evolution' in economics and its implications for production theory*, 11 JOURNAL OF ECONOMIC METHODOLOGY 125 (2004); Christian Cordes, *Darwinism in economics: from analogy to continuity*, 16 JOURNAL OF EVOLUTIONARY ECONOMICS 529 (2006).

³⁹ It should also be mentioned here that Hodgson recently proposed a taxonomy of the relationship between biology and economics, involving a basic distinction between "(1) *Theories of interaction– theories addressing the nature and extent of causal interaction between biological and social phenomena.*" and "(2) *Theories of commonality– theories proposing common laws or principles that apply to both biological and social phenomena.*" See Geoffrey M. Hodgson, *Taxonomizing the Relationship Between Biology and Economics: A Very Long Engagement*, 9 JOURNAL OF BIOECONOMICS 169, 171-172 (2007). Whereas his "theories of commonality" seem to map onto Vromen's first cluster, the "theories of interaction" appear more related to the "continuity thesis" of the second cluster in Vromen's terminology.

⁴⁰ Vromen, *supra* note 36, 222.

⁴¹ *Id.*, 226.

"III. *A Layered Ontology* – There are several related levels of organization in the economic realm that in turn are realized in lower levels of organization (studied by psychology, biology, chemistry and physics), and at which evolutionary processes may be going on concurrently."⁴²

Interestingly, teasing apart these three clusters of issues at the same time allows Vromen, in offering some speculations on how to make "credible combinations" between his clusters, to mention the work of some authors who otherwise – for reasons I still fail to fully understand – appear to be only rarely discussed in the literature on "evolutionary economics". Perhaps unsurprisingly, these include the (among other things behavioral) economists influenced by dual inheritance theory I already mentioned, Gintis and Fehr, as well as other economists who sometimes would seem to prefer to stick more closely to the "narrower" evolutionary psychological style of theorizing.⁴³ Still according to Vromen:

"The belief that there are evolutionary processes going on in the economic realm need not be accompanied by the acceptance of the continuity thesis or of a layered ontology (...). Conversely, acceptance of the continuity thesis or of a layered ontology may be accompanied by an implicit or explicit denial that there are evolutionary processes going on in the economic realm."⁴⁴

Of course, this does not have to mean that these analytically separable clusters of contentious issues are somehow inherently incapable of being effectively combined, as, for that matter, Vromen himself clearly acknowledges.

Quite to the contrary, I believe that the work of Boyd and Richerson and other dual inheritance theorists shows that a flexibly conceived "generalized Darwinism" – focusing on population thinking rather than on natural selection *per se* – can go hand in hand with an acceptance of (some version of) the "continuity thesis". Rendered in the language of dual inheritance theory, the latter manages to address

⁴² *Id.*, 229.

⁴³ Such as Arthur J. Robson, *The Biological Basis of Economic Behavior*, 39 JOURNAL OF ECONOMIC LITERATURE 11 (2001); Avner Ben-Ner & Louis Putterman, *On some implications of evolutionary psychology for the study of preferences and institutions*, 43 JOURNAL OF ECONOMIC BEHAVIOR & ORGANIZATION 91 (2000); Elizabeth Hoffman, Kevin A. McCabe & Vernon L. Smith, *Behavioral Foundations of Reciprocity: Experimental Economics and Evolutionary Psychology*, 36 ECONOMIC INQUIRY 335 (1998).

⁴⁴ Vromen, *supra* note 36, 234.

both cultural evolution *and* the evolution of culture and human cultural capacities within one and the same evolutionary theoretical framework. Furthermore, this approach appears capable of accommodating, at least in principle, Vromen's third cluster of related issues, namely the question of a layered ontology, involving multiple levels of organization and the upward and downward causal relationships between them. Let me quote again from McElreath and Henrich's work:

"In evolutionary models, this classical conflict between explanations at the level of the society (think Durkheimian social facts) and explanations at the level of individuals (think microeconomics) simply disappears. Population models allow explanation and real causation at both levels (and more than two levels) to exist seamlessly and meaningfully in one theory. We don't have to choose between atomistic and group-level explanations. Instead, one can build models about how individuals can create population-level effects which then change individuals in powerful ways."⁴⁵

Boyd and Richerson themselves put it very succinctly, but accurately like this: "Darwinian tools were *invented* to integrate levels".⁴⁶ It was this aspect of the dual inheritance theoretical framework that I had in mind when I chose as a subtitle for this article "Towards the *co-evolution* of – individual – behavior and – socio-cultural – institutions".⁴⁷ While recognizing two levels of organization – the genetic one and the cultural one – is likely to turn out to be insufficient,⁴⁸ it would nonetheless seem to be a good starting point. So what we have here are at the very least some promising ways in which to address micro-macro type problems that could be of interest to the study of legal institutional change.

In this respect, however, mention should at least be made of two other, related, strands of research. The first regards David Sloan Wilson's widely discussed

⁴⁵ Richard McElreath & Joseph Henrich, *Modelling cultural evolution*, in OXFORD HANDBOOK OF EVOLUTIONARY PSYCHOLOGY, 571, 571 (R.I.M. Dunbar & Louise Barrett eds., 2007).

⁴⁶ RICHERSON & BOYD, *supra* note 10, 247.

⁴⁷ Similar views are expressed in Jeroen C.J.M. van den Bergh & Sigrid Stagl, *Coevolution of economic behaviour and institutions: towards a theory of institutional change*, 13 JOURNAL OF EVOLUTIONARY ECONOMICS 289 (2003), to which the (sub)title of this article obviously makes reference. See also Jeroen C.J.M. van den Bergh & John M. Gowdy, *The microfoundations of macroeconomics: an evolutionary perspective*, 27 CAMBRIDGE JOURNAL OF ECONOMICS 65 (2003).

⁴⁸ See already, e.g., in evolutionary economics: Geoffrey M. Hodgson & Thorbjørn Knudsen, *From Group Selection to Organizational Interactors*, MPI JENA PAPERS ON ECONOMICS AND EVOLUTION # 0716 (2007).

continuing quest to (re-)introduce multi-level evolutionary approaches into the human behavioral sciences.⁴⁹ The second concerns Kevin Laland, John Odling-Smee and Marcus Feldman's proposal on niche construction.⁵⁰ Niche construction can indeed be said to add a third, intermediary level to the levels mentioned earlier, allowing for what has been called "ecological inheritance" and an increasingly active role of (human) organisms in molding their own (cultural) environments. Commenting on this niche construction theoretical framework, Samuel Bowles for that matter already argued that economic institutions could usefully be conceptualized as exactly such ecological niches.⁵¹ Perhaps a similar type of reasoning could apply for legal institutions.

Even though the exact relations between all of these relatively recent approaches remain debated, there are clear common points of reference between them. Indeed, what these approaches share is a multi-level and multi-process perspective on evolution, leading to a hierarchical evolutionary theory, and thereby allowing for more "complexity" to enter into the picture.

2. Systems theory

This brings me to an even briefer and even more tentative digression into systems theory – or at least sociological systems theory in the sense developed by Niklas Luhmann and further developed by other authors, in law perhaps most notably Gunther Teubner.⁵² As to the latter, I can only assume that he is not a great

⁴⁹ See David Sloan Wilson, *Group-level evolutionary processes*, in OXFORD HANDBOOK OF EVOLUTIONARY PSYCHOLOGY, 49 (R.I.M. Dunbar & Louise Barrett eds., 2007); David Sloan Wilson, *The New Fable of the Bees: Multilevel Selection, Adaptive Societies, and the Concept of Self Interest*, in EVOLUTIONARY PSYCHOLOGY AND ECONOMIC THEORY (ADVANCES IN AUSTRIAN ECONOMICS 7), 201 (Roger Koppl ed., 2004). See also Wilson's analyses of religions in DAVID SLOAN WILSON, DARWIN'S CATHEDRAL: EVOLUTION, RELIGION, AND THE NATURE OF SOCIETY (2002).

⁵⁰ See Kevin N. Laland, F. John Odling-Smee & Marcus W. Feldman, *Niche Construction, Ecological Inheritance, and Cycles of Contingency in Evolution*, in CYCLES OF CONTINGENCY: DEVELOPMENTAL SYSTEMS AND EVOLUTION, 117 (Susan Oyama, Paul E. Griffiths & Russell D. Gray eds., 2001); Kevin N. Laland, John Odling-Smee & Marcus W. Feldman, *Niche construction, biological evolution, and cultural change*, 23 BEHAVIORAL AND BRAIN SCIENCES 131 (2000). See also, e.g., HENRY PLOTKIN, THE IMAGINED WORLD MADE REAL: TOWARDS A NATURAL SCIENCE OF CULTURE, 213-246 (2002).

⁵¹ Samuel Bowles, *Economic institutions as ecological niches*, 23 BEHAVIORAL AND BRAIN SCIENCES 148 (2000).

⁵² A thorough comparison of Luhmann's theoretical framework with dual inheritance theory and other multi-level evolutionary approaches would in any case be well beyond the scope of this altogether short article. Some aspects of such a comparison can perhaps be glanced from the German reactions to Peter J. Richerson & Robert Boyd, *Evolution: The Darwinian Theory of Social Change – An Homage to Donald T. Campbell*, in PARADIGMS OF SOCIAL CHANGE: MODERNIZATION, DEVELOPMENT, TRANSFORMATION, EVOLUTION, 257 (Waltraud Schelkle, Wolf-Hagen Krauth, Martin Kohli & Georg Elwert eds., 2000). See

supporter, to say the very least, of sociobiological approaches to human society and culture. Indeed, in an attempt to replace "(t)he straightforward idea of law's evolution towards efficiency"⁵³ – an attempt with which I have as such absolutely no problem whatsoever, given that there most likely is no straightforward relation between efficiency and evolutionary theory – Teubner states, among other things, the following:

"The evolving unit is neither a text nor is it a group but a self-organising social system. (...) This excludes from the outset sociobiology, which reduces social phenomena (behaviour, rules, laws) to their function of maintaining biological units, whether individuals, species, groups, or genes".⁵⁴

But does it really? Are the legal and other social subsystems as autonomous and supra-organic as Teubner and likeminded theorists would have it?⁵⁵ Although I would not want to claim to have an answer to the last question – far from it actually – I do find it necessary to point out that at least some of the approaches developed – and developing – in the wake of sociobiology are quite prepared to take into account the possibility of emergent properties at higher levels of organization, to introduce non-linear dynamics or feedbacks between different levels into their models or to incorporate non-genetic systems of inheritance, in short, to expand the received view of the neo-Darwinian modern synthesis in various ways. However, they are equally likely to provide a different view on the relationships between different levels of organization than the ones espoused by some proponents of self-organization and systems theory. More specifically, they offer a promising starting point to more rigorously address, so to speak, the "structural couplings" between *different types* of systems (biological, psychic, social).

also Niklas Luhmann, *Systemtheorie, Evolutionstheorie und Kommunikationstheorie*, in *SOZIOLOGISCHE AUFKLÄRUNG 2: AUFSÄTZE ZUR THEORIE DER GESELLSCHAFT*, 193 (1975/1991 (4th ed.)).

⁵³ Gunther Teubner, *Idiosyncratic Production Regimes: Co-evolution of Economic and Legal Institutions in the Varieties of Capitalism*, in *THE EVOLUTION OF CULTURAL ENTITIES (PROCEEDINGS OF THE BRITISH ACADEMY 112)*, 161, 167 (Michael Wheeler, John Ziman & Margaret A. Boden eds., 2002).

⁵⁴ *Id.*, 164. See also GUNTHER TEUBNER, *LAW AS AN AUTOPOIETIC SYSTEM*, 52-53 (1993).

⁵⁵ See also, e.g., the exchange between Marc Amstutz and Manfred Aschke in, respectively, Marc Amstutz, *Widerstreitende Götter: Zu Manfred Aschkes Rekonstruktion der systemsoziologischen Evolutionstheorie und ihrer rechtstheoretischen Bedeutung*, 2 *RECHTSGESCHICHTE: ZEITSCHRIFT DES MAX-PLANCK-INSTITUTS FÜR EUROPÄISCHE RECHTSGESCHICHTE* 14 (2003) and Manfred Aschke, *Evolutionstheorie für das Recht der Marktgesellschaft: Zu Marc Amstutz, Evolutorisches Wirtschaftsrecht. Vorstudien zum Recht und seiner Methode in den Diskurskollisionen der Marktgesellschaft*, 2 *RECHTSGESCHICHTE: ZEITSCHRIFT DES MAX-PLANCK-INSTITUTS FÜR EUROPÄISCHE RECHTSGESCHICHTE* 25 (2003).

Moreover, regardless of the usefulness of Luhmann's specific sociological systems theoretical framework in describing societal subsystems like the legal system, their development and their connections, it is rather questionable whether the most appropriate way to view the relationship between systems theory and evolutionary theory more generally really is to regard them as if this relationship is one of mutual exclusion or – to use David Sloan Wilson's apt phrasing – as if more self-organization necessarily means less natural selection and vice versa.⁵⁶ This having been said, it does warrant repetition that most of the theorists on whose work I have drawn so far in this and the previous section of this article appear quite open to the prospect of combining their evolutionary framework with insights and methods associated with systems theoretical approaches. To reconcile both theoretical frameworks will likely require movement from both sides,⁵⁷ and, given my own point of departure, I am simply more inclined to be interested in the movement that is being made from what could be called the "evolutionary side", which, obviously, does not imply any a priori negative assessment of any movement concurrently being made from the "opposite" direction.

II. Transnationalization of commercial law and dual inheritance theory

Apart from, in my view at least, the general advantage of dual inheritance theory of being able to cut across Vromen's clusters of troubling issues continuing to divide evolutionary economics – and, by way of analogy, most likely, even if so far largely implicitly, also the various evolutionary approaches to law presented in this theme issue – there are, I believe, a few more concrete linking pins between dual inheritance theory, or research informed by dual inheritance theory, and the project on transformations of commercial law on which we were invited to comment. I would like to loosely structure these more specific linking pins around two basic notions arising from Graf-Peter Callies's writings on the subject, even though they may not (yet) map exactly onto his conceptualizations. One concerns the

⁵⁶ David Sloan Wilson, *Natural selection and complex systems: a complex interaction*, in SELF-ORGANISATION AND EVOLUTION OF COMPLEX SYSTEMS, 151, 152 (Charlotte K. Hemelrijk ed., 2005) ("This view of evolution and complexity suffers from being – well, too simple."). For an in some respects similar argument in evolutionary economics, see Geoffrey M. Hodgson, *Darwinism in economics: from analogy to ontology*, 12 JOURNAL OF EVOLUTIONARY ECONOMICS 259, 264-266 (2002); Hodgson & Knudsen, *supra* note 37, 6-10.

⁵⁷ In other words, not that much appears to have changed since Luhmann wrote that "das Problem (...) verlagert sich heute mehr und mehr in die Frage des Verhältnisses von Evolutionstheorie und Systemtheorie, oder genauer: des Verhältnisses von Variation/Selektion und System/Umwelt als verschiedener, abstimmungsbedürftiger Formwahlen einer Theorie" (NIKLAS LUHMANN, DAS RECHT DER GESELLSCHAFT (SUHRKAMP TASCHENBUCH WISSENSCHAFT 1183), 241 (1993/1995)).

privatization of civil law and the problem of legal certainty, the other the civilization of private law and the problem of fairness.⁵⁸

1. Privatization of civil law and legal certainty

The emergence of private ordering mechanisms in globalized exchange actually fits quite nicely with dual inheritance theorists' attempts to provide an evolutionary explanation for larger-scale cooperation in groups of unrelated individuals. At least an important part of an evolutionary approach to private ordering mechanisms like the ones that appear to have caught the attention of people working on globalized exchange processes, would indeed seem to involve an answer to the question of how they can work in the first place. And it has been pointed out repeatedly that such an answer excludes reference being made to already existing and (more or less) functioning institutions like states.⁵⁹

Now if we follow Calliess and his co-authors in their claim that "generally the bundling of a plurality of trilateral governance mechanisms such as private norms, arbitration and social sanctions into effective private governance regimes (...) or private legal systems (...) is essential in order to get anywhere in terms of production of legal certainty",⁶⁰ more information on the origins and characteristics of the mechanisms underlying such "trilateral governance mechanisms" may prove to come in handy. A few cursory examples from the, in my view, very relevant evolutionary literature should be able to clarify this further.

For instance, in formulating her theory of – privately ordered – ethnically homogeneous middleman groups and explaining their success, Janet Landa not only draws on both New Institutional Economics and Boyd and Richerson's work,⁶¹

⁵⁸ See Graf-Peter Calliess, *Reflexive Transnational Law: The Privatisation of Civil Law and the Civilisation of Private Law*, 23 ZEITSCHRIFT FÜR RECHTSSOZIOLOGIE 185 (2002). See also Graf-Peter Calliess, *Billigkeit und effektiver Rechtsschutz: Zu Innovation und Evolution des (Zivil-)Rechts in der Globalisierung*, 26 ZEITSCHRIFT FÜR RECHTSSOZIOLOGIE 35 (2005).

⁵⁹ See, 0, Ernst Fehr & Urs Fischbacher, *Social norms and human cooperation*, 8 TRENDS IN COGNITIVE SCIENCES 185, 185 (2004); Joseph Henrich, Wulf Albers, Robert Boyd, Gerd Gigerenzer, Kevin A. McCabe, Axel Ockenfels & H. Peyton Young, *Group Report: What Is the Role of Culture in Bounded Rationality?*, in BOUNDED RATIONALITY: THE ADAPTIVE TOOLBOX, 343, 350-352 (Gerd Gigerenzer & Reinhard Selten eds., 2001).

⁶⁰ Graf-Peter Calliess, Thomas Dietz, Wioletta Konradi, Holger Nieswandt & Fabian Sosa, *Transformations of Commercial Law: New Forms of Legal Certainty for Globalized Exchange Processes?*, in TRANSFORMING THE GOLDEN-AGE NATION STATE, 83, 100 (Achim Hurrelmann, Stephan Leibfried, Kerstin Martens & Peter Mayer eds., 2007).

⁶¹ See Janet T. Landa, *The Law and Bioeconomics of Ethnic Cooperation and Conflict in Plural Societies of Southeast Asia: a Theory of Chinese Merchant Success*, 1 JOURNAL OF BIOECONOMICS 269 (1999).

but also receives enthusiastic endorsement from David Wilson, who sees certain aspects of his ideas on multi-level selection theory and group selection confirmed by her work.⁶² Similarly, in a recent book entitled "Moral Sentiments and Material Interests: The Foundations of Cooperation in Economic Life", Samuel Bowles and Herbert Gintis investigate, within their framework of strong reciprocity and other-regarding preferences, the role of what they call community governance, arguing that "communities work well relative to markets and states where the tasks are qualitative and hard to capture in explicit contracts, and the conflicts of interest among the members are limited".⁶³ Richerson and Boyd for their part reach the conclusion that "social innovations that make larger-scale society possible, but at the same time effectively simulate life in a tribal-scale society, will tend to spread".⁶⁴

Again, insofar as Calliess and his co-authors quite plausibly stress that "the competitive capacity of private and public governance mechanisms is decisive for the evolution of the institutional mix",⁶⁵ evolutionarily informed research projects like the ones I mentioned could be vital in filling in parts of the "competitive capacity" aspect of their hypothesis with regard to certain types of what could be referred to as "internationalized communities".

2. *Civilization of private law and fairness*

Related to the foregoing – and presumably already given away by the use of the words "moral sentiments" there – is the fact that adopting an evolutionary approach to human behavior like dual inheritance theory need not imply that values are left out of sight. So, when looked at from an evolutionary behavioral perspective, the privatization of civil law does not necessarily have to lead to a de-civilization of private law.

⁶² See David Sloan Wilson, *Religious Groups and Homogeneous Merchant Groups as Adaptive Units: A Multilevel Evolutionary Perspective*, 2 JOURNAL OF BIOECONOMICS 271 (2000).

⁶³ Samuel Bowles & Herbert Gintis, *Social Capital, Moral Sentiments, and Community Governance*, in MORAL SENTIMENTS AND MATERIAL INTERESTS: THE FOUNDATIONS OF COOPERATION IN ECONOMIC LIFE, 379, 395 (Herbert Gintis, Samuel Bowles, Robert Boyd & Ernst Fehr eds., 2005). See also Dan M. Kahan, *The Logic of Reciprocity: Trust, Collective Action, and Law*, in MORAL SENTIMENTS AND MATERIAL INTERESTS: THE FOUNDATIONS OF COOPERATION IN ECONOMIC LIFE, 339 (Herbert Gintis, Samuel Bowles, Robert Boyd & Ernst Fehr eds., 2005).

⁶⁴ RICHERSON & BOYD, *supra* note 10, 230.

⁶⁵ Calliess, Dietz, Konradi, Nieswandt & Sosa, *supra* note 60, 102.

To briefly illustrate this in what little space I have left, I will just mention one additional research project that, in taking similar issues to heart, makes use of dual inheritance theory, among other theoretical frameworks. I am referring to the Gruter Institute for Law and Behavioral Research's project entitled "Free enterprise: Values in action".⁶⁶ In this project, a multi-disciplinary group of scholars, including the apparently nearly omni-present Boyd and Richerson,⁶⁷ make a strong case for the existence of a variety of mechanisms able to sustain values in market environments, even increasingly globalized ones. The upshot of the project thus far seems to be that values are indeed forgotten ingredients in what makes markets work, "they are ubiquitous behavioral realities, playing a critical role in facilitating the trustworthiness, fairness, and honesty that promote cooperation in one-on-one interactions, firms, institutions, and society as a whole".⁶⁸

E. Concluding remarks

In the previous sections, I hope to have shown that dual inheritance theory – while at first sight perhaps less useful to illuminate our understanding of (relatively) short-term institutional change than are other "evolutionary" approaches to law, which to a greater or lesser extent emphasize or imply the discontinuity between biological and socio-cultural evolution – nonetheless is likely to be able to provide us with some of the indispensable building blocks needed to study the co-evolution of behavior and institutions. Hence, I would like to conclude this article with two perhaps somewhat provocative take home messages.

First, perhaps the time has come for evolutionary minded legal scholars to replenish from the original source, being *biological* evolutionary theory, as currently applied in a variety of ways to our own species. To quote once more from Vromen's work, just as "evolutionary economists who forego the opportunity to be informed about what is happening in evolutionary theorizing elsewhere do this to their own

⁶⁶ The results have recently been published as MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY (Paul J. Zak ed., 2008). Various papers pertaining to this project are available at: <http://www.ssrn.com/link/Gruter-Institute.html>.

⁶⁷ See Peter J. Richerson & Robert Boyd, *The Evolution of Free Enterprise Values*, in MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY, 107 (Paul J. Zak ed., 2008), available at: <http://ssrn.com/abstract=929169>, last accessed: 27 March 2008.

⁶⁸ See Oliver R. Goodenough & Monika Gruter Cheney, *Preface: Is Free Enterprise Values in Action?*, in MORAL MARKETS: THE CRITICAL ROLE OF VALUES IN THE ECONOMY, xiii, xiv (Paul J. Zak ed., 2008), available at: <http://ssrn.com/abstract=967492>, last accessed: 27 March 2008.

detriment",⁶⁹ evolutionary minded legal scholars in my view should try to resist the temptation to stray too far from what is currently happening within the actually quite broad field of evolutionary approaches to human behavior – by now clearly including human socio-cultural behavior. This is not to say that there cannot be anything specific about evolutionary processes, if any, in the legal realm. It just means that this specificity should not always be presumed. Leaving aside premature presumptions about the specificity of evolutionary processes, again if any, in the legal realm, is likely to pay the additional dividend of being able to reconnect with other social scientific disciplines devoted to the study of human behavior and institutions from an evolutionary perspective.

Secondly, this article could also be seen as a plea for not leaving out of sight "lower" levels of organization when discussing change at "higher" levels of organization. Indeed, especially when addressing issues like the globalization or transnationalization of commercial activities and their regulation, one easily runs the risk of losing sight of what is happening at "lower" levels of organization, like the behavioral one. Multi-level evolutionary theories like dual inheritance theory then offer one possible and promising way of thinking about the complex relationships between these different levels of organization.

⁶⁹ Vromen, *supra* note 36, 234.