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Iterative lagged asymmetric responses in strategic management and long-range planning

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Abstract

Actors in competitive environments are bound to decide and act under conditions of uncertainty because they rarely have accurate foreknowledge of *how* their opponents will respond and *when* they will respond. Just as a competitor makes a move to improve their standing on a given variable relative to a target competitor, she should expect the latter to counteract with an *iterative lagged asymmetric response*, that is, with a sequence of countermoves (*iteration*) that is very different in kind from its trigger (*asymmetry*) and that will be launched at some unknown point in the future (*time lag*). The paper explicates the broad relevance of the newly proposed concept of "iterative lagged asymmetric responses" to the social study of temporality and to fields as diverse as intelligence and counterintelligence studies, strategic management, futures studies, military theory, and long-range planning. By bringing out in the foreground and substantiating the observation that competitive environments place a strategic premium on surprise, the concept of iterative lagged asymmetric responses makes a contribution to the never-ending and many-pronged debate about the extent to which the future can be predicted.

Keywords

Temporality, strategy, time lags, competition, forecasting, futures studies, decision-making under uncertainty, coevolution, conflict, intelligence and counterintelligence studies

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Introduction

Competition and cooperation are fundamental attributes of animal and human societies at all levels of analysis (Axelrod, 2006; Fjeldstad et al., 2012; Simpson and Willer, 2015). They are carried out by a changing mix of actors, with a changing mix of concerns, enthralled into cascades of action and response to one another's moves, which in turn sustain an interactional, highly contingent, social field (Abbott, 2001, 2016; Fligstein and McAdam, 2011; Simandan, 2017). Competition and cooperation are often imbricated with each other, which means that their identification in a given context is a function of one's research focus and theoretical background (Bowles and Gintis, 2011; McNamara, 2013; Miekisz, 2008).

An intuitive example of imbrication would be that of two soccer teams competing in a game. From the standpoint of aiming to win the game, the two teams are competing; from the higher standpoint of publicizing the beauty and interestingness of soccer to a social audience, the two teams are cooperating, by, for example, giving their best, playing by the rules, and so on. Each team is constituted by a collection of players who must cooperate with one another in order to have a chance at winning the higher order competition with the other team. At the same time, within each team, there is also competition among players on various performance metrics, such as who scored the most. From an evolutionary standpoint, rank and status are important concerns, and humans are motivated to preserve and improve their social standing on a variety of evolutionary-relevant dimensions (attractiveness, peer respect, social dominance, financial resources, etc.). As social comparison theory argues, the relentless preoccupation with monitoring one's social standing makes humans highly sensitized to moves that threaten it and thereby triggers "competitive behavior to protect one's superiority" (Festinger, 1954: 126). The extent of prior interaction makes a difference in how competition is carried out.

A growing research literature (Converse and Reinhard, 2016) distinguishes between merely *incidental* competitors (with no shared history of competing with each other) and *rival* competitors. Rivalry appears only when there is a history of competition between the two actors and when both of them subjectively identify each other as such. Unlike incidental competitors, rivals perceive the current competition as connected to the past ones, they put more effort and eagerness into their competitive performance, they are less prudent, and they tend to be concerned with their long-term legacy, that is, with how the broader social context will judge the whole history of competition between them and a particular rival (Converse and Reinhard, 2016). The expanding research literature on the interface between competition and cooperation (Chen, 2008; Chen and Miller, 2015; Jordan et al., 2017;

Miller and Page, 2009; Rand, 2016) has pointed out that these two forms of social engagement are creatively hybridized by actors into combinations such as "cooperation-oriented competition" (e.g. Gnyawali and Madhavan, 2001), "competition-oriented cooperation" (e.g. Khanna et al., 1998), and "co-opetition" (e.g. Brandenburger and Nalebuff, 1996).

To couch the foregoing discussion in the evocative vocabulary of coupled fitness landscapes, in any given social realm, individual and collective actors usually compete to maintain or improve their standing on an established fitness function (e.g. money; market share; election to office; geopolitical power; technological preeminence; military superiority) and occasionally to even reconfigure the fitness function itself (Kauffman and Johnsen, 1991; Gerrits and Marks, 2015; Richter, 2014). Attempts at fitness maintenance or improvement sometimes occur in zero-sum game circumstances, whereby the success of one actor presupposes a loss of fitness for its competitors.

Dynamics of initiative and response in competitive strategy

Understandably, competitors will respond to one another's moves in an attempt to undo a loss of fitness. When an individual or collective actor ("the initiator") makes a move to improve their fitness to the detriment of another actor ("the responder" or "the target actor"), the initiating actor needs to plan their move with the assumption that the target actor will try to counteract it somehow at some point in the future. To express this more formally, the dynamic of a coupled fitness landscape can be analytically reconstructed at its most elemental level of analysis in the form of (initiative; response) pairs, crafted and carried out by rival or incidental competitors entangled with each other in a (initiator; responder) pair. Responses vary in kind, but in many situations, they have two attributes that produce irreducible uncertainty about the future: they tend to be asymmetric, and they become discernible and yield results with some unknown time lag. "Iterative lagged asymmetric responses" is a phrase that efficiently summarizes this information and makes it memorable and explicit.

The objective of this paper is to introduce this concept and demonstrate its usefulness not only to time and temporality scholarship (Cipriani, 2013; Deeds Ermarth, 2010; Keefer et al., 2017; Moran, 2015) but also to the fields of intelligence and counterintelligence studies (Chang and Tetlock, 2016; Clark, 2016; Heuer, 1999), strategic management (Gavetti and Menon, 2016; Kunisch et al., 2017; Thietart, 2016), futures studies (Aligica, 2003; Bergman et al., 2010; Tuomi, 2012), military theory (Angstrom and Widén, 2015; Milevski, 2014; Thornton, 2007), and long-range planning (Peter and Jarratt, 2015; Rao, 2011). The remaining of the

paper will show that the new concept can aid the development of strategy and of specific competitive tactics by exposing the *known unknown* of the situation (cf. Feduzi and Runde, 2014): just as the initiator makes a move to improve their standing on a given variable relative to a target competitor, she should expect the latter to counteract with an iterative lagged asymmetric response, that is, with a sequence of countermoves that is very different in kind from its trigger and that will be launched at some unknown point in the future.

Asymmetry or dissimilarity of response is a well-researched and well-tested strategy (Freedman, 2015) and its popularity in intelligence and counterintelligence studies, strategic management, and military affairs testifies to its efficacy (Thornton, 2007). Perhaps incautiously, some scholars (e.g. Fahey, 1999; Milevski, 2014) have gone so far so as to generalize its relevance and claim that (all) strategy *is* asymmetry. Competitors tend to respond with moves that play to their own resources and dynamic capabilities and that encapsulate an element of surprise (Kiechel, 2010; Miller, 2003; Porter, 1996; Schilke, 2014; Tembine et al., 2007; Wilden and Gudergan, 2015). Given that their moves tend to play to their strengths, and that any particular actor embodies a circumscribed range of strengths, the element of surprise is thereby kept within bounds by competitors' partial knowledge of one another's strengths. The importance of asymmetry to effective competition has already been the object of conceptual development in strategic studies, as reflected in the empirically informed theory of ''asymmetric warfare'' (Thornton, 2007; for a critique, see Winter, 2011). Asymmetric warfare presupposes – and is, therefore, limited to – a macroscopic analysis or a large territorial extent that subtends countries, regions, and even the global scale in the case of the ''global war on terror''. The concept of ''iterative lagged asymmetric responses'' carries a double advantage in that respect: firstly, it affords wider investigative reach through its applicability to both micro-scales and macro-scales of analysis; secondly, it highlights time lags as a distinct contributor to uncertainty, over and above the uncertainty caused by the asymmetry of the response. Both of these aspects deserve some elaboration and illustration.

''Iterative lagged asymmetric responses'' can be deployed to analyze the dynamics of competition at the micro-scale of two individual competitors, of small teams, and small groups. By directing attention to identifying particular sequences of competitive initiatives and responses, as opposed to an unspecified macro-study of a generic, nebulous, ''warfare'', the newly proposed concept can help uncover a rich universe of knowledge outside the analytical reach of the concept of asymmetric warfare. To use the power of analogy, ''iterative lagged asymmetric responses'' is a needed complement to ''asymmetric warfare'', just as a painter's fine brush is a needed complement to their broad brush.

In order to illustrate this point and help develop the perceptiveness and alertness required for detecting iterative lagged asymmetric responses in everyday life, let us consider this intricate situation depicted in season three of the popular television show "The Good Wife". Lawyer Alicia Florick is married to newly elected governor and outgoing district attorney Peter Florick, but has an affair with her boss Will Gardner. As Peter Florick learns of this move (which undermines his mating fitness), he counterattacks by opening, with some delay, an investigation into the alleged corruption of Will Gardner. In other words, the response occurs with a time lag and is dissimilar to the original move: a mating threat (Gardner ruining his marriage) is being reciprocated with a legal and professional threat (Peter Florick destroying Will Gardner's standing as a respected professional and law-abiding citizen). Nested within this lagged asymmetric response lays another one: attorney Wendy Scarr has lost the race for becoming governor to Peter Florick and she is bitter about it. Once elected, the latter has the seemingly brilliant idea to appoint his former electoral opponent Wendy Scarr to head the aforementioned investigation against the allegedly corrupt Will Gardner. This move was hoped to publicize the magnanimity and chivalry of the new governor toward his rivals, as well as the independence of the investigation from any suspicion of its manipulation by Peter Florick. Bent on avenging her electoral defeat, Wendy Scarr takes advantage of the earlier professional links between governor-elect Peter Florick and the allegedly corrupt Will Gardner and uses her ostensible enquiry into Gardner to dissimulate her actual enquiry into uncovering evidence of corruption of Peter Florick himself. In other words, her response to the electoral defeat was neither symmetrical (e.g. to beat Florick in the next election) nor instantaneous. Instead, the drama and suspense and addictiveness of the show were fueled by a crafty, surprising iteration and nesting of lagged asymmetric responses within other lagged asymmetric responses. In George Ainslie's words, "appetite is best refreshed by being confronted with delay and surprise" (Ainslie, 2013: 462; see also Runia, 2014).

Whereas this example shows how any competitive circumstance, however small (e.g. power dynamic within a work office, a presidential team, a family, etc.), can be investigated and explicated with the help of the newly proposed concept, it is worth remembering that, far from being trivial, such micro-work is necessary but far from sufficient for the task of predicting the macro-behavior of complex social systems. As Vespignani has put it (2009: 427),

> the biggest challenge in providing a holistic description of multiscale networks is the necessity of simultaneously dealing with multiple time and length scales.

The final system's dynamical behavior at any scale is the product of the events taking place on all scales.

Time lags in competitive strategy

The second advantage of the concept of iterative lagged asymmetric responses is that it helps reveal why time lags are a source of uncertainty just as significant as the dissimilarity or asymmetry of the competitor's response (Chen and MacMillan, 1992; Luoma et al., 2017; San Cristóba, 2014; Schwartz, 1975). Several types of time lags are undergirding a competitor's elaboration and execution of a given response. A most useful entry point into grasping the uncertainty generated by time lags is tracking how they appear at every step of the decision-making process. Military strategist John Boyd has famously described the latter as a "loop" constituted by four analytically distinguishable, but ontologically overlapping activities: observation, orientation, decision, and action (Osinga, 2007). Each one of them necessarily takes some time, and therefore produces unescapable delays.

Observation lags

Observation lags are constituted by the temporal gap between the target competitor's undertaking of a given fitness countermove and its perception by the initiator of the triggering move. What actors attend to in their environments is a function of their interests and beliefs. Humans are prone to confirmation bias, that is, to the tendency to seek and notice only evidence that supports their prior beliefs (Kahneman, 2011). They are also prone to the "ostrich effect" (Karlsson et al., 2009), or the deliberate inattention to potentially upsetting information. Cunning competitors often exploit these short-comings of rationality through a wide array of denial and deception tactics (Godson and Wirtz, 2011), that collectively demonstrate why "absence of evidence often provides only weak evidence of absence" (Sober, 2009: 89). Competitive countermoves that rely on stealth, guile, and dissimulation are routinely recommended by strategists precisely because by extending the observation lag they give the opponent too little time to comprehend what is happening and mount an effective response. Another source of observation lags stems from the fact that competitive responses often do not take the shape of a discrete move, but that of a multi-annual, protracted process constituted by *iterative* lagged asymmetric responses (Smith et al., 1992, 2001).

Thus, a geopolitical power may organize a long-term and multi-pronged challenge to the regional supremacy of a rival power, or a business in a

duopoly may develop a far-sighted sequence of tactics to corner its competitor out of the market and achieve a situation of monopoly. The extended duration of such competitive responses acts in and of itself as a form of stealth because of the phenomenon evocatively labeled by John Magnuson "the invisible present":

> It is the unusual person who senses with any precision changes occurring over decades. At this timescale, we are inclined to think the world is static, and we typically underestimate the degree of change that does occur. Because we are unable directly to sense slow changes, and because we are even more limited in our abilities to interpret their cause-and-effect relations, processes acting over decades are hidden and reside in what I call the invisible present. (Magnuson, 1990: 501)

Orientation lags

Orientation lags occur whenever the substantive nature of the responder's countermove is not immediately obvious to the initiating actor. In other words, orientation lags describe the time between perceiving the disparate "weak signals" (Mendonça et al., 2004) or "multiple fallible indicators" (Brunswik, 1943) left by one's opponent's maneuvering, and connecting these data points with one another and with one's prior knowledge to achieve a meaningful representation or "frame" of what is going on (Cornelissen and Werner, 2014; Hill et al., 2015; Ohlsson, 2011). The degree to which the developed mental frame corresponds to the actual competitive situation is a function of the intelligence, expertise, and due diligence brought to the task by the respective actor, but empirical research by Miller and Sardais (2013) has identified three major ways in which framing can go wrong: the omission of crucial elements of the real situation, the inclusion of irrelevant, distracting pieces of information, and the misleading ordering or synthesis of the considered information. Making sense of what is going on can be further sabotaged by the responding actor directly, by priming a believable frame in the mind of the initiating actor. Priming works because it delivers a ready-made frame and thus spares one the effort to cobble together a new one. It thus exploits the well-documented propensity of humans to avoid cognitively demanding tasks (Kahneman, 2011). The primed frame manipulates one's opponent effectively, by triggering new mental associations, which in turn bring out new emotions and dispositions, which then lead the actor to make those choices and engage in those actions that further the aims of their opponent (Gavetti, 2012). Orientation lags can be exacerbated when the available data points are

contradictory and thereby trigger multiple, mutually exclusive interpretive frameworks, without any clear indication as to which one is the most likely (Endsley, 1995; Lipton, 2004). Shrewd tacticians exploit this trick to sow confusion by planting false evidence, thus cultivating a seamless blend of fact and fiction that sends their opponents spinning amidst smokescreens and mirrors.

Decision-making lags

Decision-making lags describe the interval between reaching an understanding of the competitive situation and settling on a specific decision about how to respond to it. At the level of the individual actor, decision-making lags may be subjectively experienced as a state of prolonged hesitation, of ''decision paralysis'', or of being ''of two minds'', because none of the considered courses of action has emerged as the obvious choice. At the level of collective actors, such as hierarchical organizations, decision-making lags are often generated by the proper application of the formal rules and procedures for deciding, which create a ''temporal landscape'' specific to that organization (Olsen, 2008; Tavory and Eliasoph, 2013; Vecchiato, 2012). The fact that ''many decisions that are judged 'intelligent' ex ante will subsequently be assessed as 'unintelligent' when all of their outcomes. . .are finally realized'' (March, 1994: 228) motivates institutional decision-makers to deploy due diligence and respect all the steps of the process, lest they will be found reckless by subsequent accountability exercises. It often takes considerable time to relay relevant information through the sanctioned channels of institutional communication, to set an agenda and a time and place to meet, to deliberate at the actual meeting(s), and to secure any further requisite authorizations before the decision has become official (Phillips and Su, 2013; Phillips and Tuladhar, 2000).

Action lags

Action lags refer to the time between reaching a specific decision and its carrying out to the point that it generates actual results. An actor may have decided on a particular countermove, but not on a particular date and place for executing it. Instead, the actor prefers to ''bide their time'' or ''lie in wait'' until a great window of opportunity naturally reveals itself and makes the execution of the countermove maximally effective (Capoccia and Kelemen, 2007; Partnoy, 2012; Shapiro and Bedi, 2006; Soifer, 2012). This approach is a staple of Chinese strategists and follows logically from the imperative of relentlessly seeking *wu-wei* or ''effortless superiority'' in

competitive contexts (Allen, 2015; Simandan, 2018). It is also enshrined in the vernacular expression "revenge is a dish best served cold", although in its case the rationale is different: on one hand, a delayed response to an offense allows the responder to avoid hasty, overemotional, and therefore counterproductive moves taken in the "heat of the moment"; on the other hand, a delayed response undermines one's opponent more effectively by *either* tormenting them psychologically through FUD (fear, uncertainty, and doubt; if they expect retaliation) *or* by catching them totally unaware (if they have completely forgotten their hostile move, and therefore have zero expectation of a countermove). From a metaphysical or ontological standpoint, some action lags are inevitable because it takes time for a causal mechanism to proceed from an ultimate cause to an intermediate cause, to a proximal cause, and finally to yield a given effect (Clemens, 2007; Grzymala-Busse, 2011; Solingen, 2012). Whether one considers deploying troops to a conflict zone, launching a new product, acquiring another business, carrying out a defamation campaign, or suing an opponent for damages, all these potential countermoves take time to execute, a fact which helps explain why temporal autocorrelation is the key attribute of real-world environments that makes short-term forecasting possible (Group et al., 2014; List, 2004).

Discussion and conclusion

Given that the responder's countermove is aimed at redressing the equilibrium upset by the initial move, it is useful to think of iterative lagged asymmetric responses as negative (balancing) feedback loops constitutive of the system that includes the initiator–responder pair (Richardson, 1999). Interestingly, computer simulations that implement the principles of systems dynamics have revealed that systems underpinned by lagged negative feedback loops very often display wild, destabilizing, and unexpected oscillatory behaviors, such as cycles of boom and bust in real estate, commodity prices, or financial markets (Borshchev and Filippov, 2004; Calvert and Simandan, 2010; Sterman, 2000). These phenomena occur (a) when actors engage in *excessive* restorative actions because they fail to take into account the long time it takes for those restorative actions to bear fruit (Rahmandad et al., 2009) and (b) when various actors do not properly evaluate what the other actors are doing (e.g. they may overestimate their competitors, underestimate them, or ignore them altogether; Elster, 2007). Indeed, as John Maynard Keynes has shown in his striking analysis of the stock market, the bounds of one's intellect are continuously tested in the social arena by the complications arising from the simultaneous attempts of

multiple agents to outguess what the others are thinking and planning (Keynes, 1936: 158):

> Professional investment may be likened to those newspaper competitions in which the competitors have to pick out the six prettiest faces from a hundred photographs, the prize being awarded to the competitor whose choice most nearly corresponds to the average preferences of the competitors as a whole: so that each competitor has to pick, not those faces which he himself finds prettiest, but those which he thinks likeliest to catch the fancy of the other competitors, all of whom are looking at the problem from the same point of view. It is not a case of choosing those which, to the best of one's judgment, are really the prettiest, not even those which average opinion genuinely thinks the prettiest. We have reached the third degree where we devote our intelligences to anticipating what average opinion expects the average opinion to be. And there are some, I believe, who practice the fourth, fifth, and higher degrees.

More generally, the study of iterative lagged asymmetric responses in the context of system-wide oscillatory behaviors brings out the fact that a diverse set of social and ecological systems can be mathematically modelled as "the dynamic behavior of collections of coupled oscillators in spatially extended systems" (Vespignani, 2012: 32).

As already illustrated, in competitive contexts time lags are at least as important in fomenting uncertainty as the asymmetric features of the opponent's response. In undertaking a move, the initiator does not know either *how* the target competitor will react (the precise nature of the asymmetry) or *when* she will react (the length of the delay). The double whammy of asymmetry and time lags means that "not only do we not know what will happen, we typically do not know what *can* happen" (Felin et al., 2014: 274). In turn, because the sample space of possible outcomes is not mathematically well-behaved, uncertainty cannot be tamed into quantitatively precise estimations of risk (Aven, 2016; Cirillo and Taleb, 2016; Hammond, 1996).

Iterative lagged asymmetric responses are both a cause and an effect of the dynamic complexity of competitive environments. Such environments are plagued by "wickedness," a term that denotes the impossibility of reliably being able to learn from experience (Hogarth et al., 2015; Simandan, 2010, 2011a, 2011b, 2011c, 2011d, 2013a, 2013b, 2016; Taleb, 2007). Time lags are a major source of wickedness because in the human mind "events that occur at the same time are associated with each other, [whereas] events that are distant in time are treated as distant in connection" (March, 1994: 198; see also March, 2010). Most social actors operate with a short time

horizon and therefore often fall victims of false-positive feedback, otherwise known as the temporal pattern "it gets better before it gets worse" (Nadkarni et al., 2016; Simandan, 2002; 2005a, 2005b, 2012). The actors initiate particular moves to improve their standing and because in the short run those moves often generate desired effects, they prematurely "learn" through immediate positive reinforcement that those moves were successful. This myopic bracketing of reality, however, cordons off causes from their delayed effects, and thereby fosters pseudo-learning or superstitious learning from experience (Anand et al., 2016). Instead, elongated time horizons and patience are needed before being able to judge a competitive move as successful: whether it is indeed successful depends on the success or failure of the iterative lagged asymmetric response it triggers, as reminded by the vernacular expression "it's not over until it's over." This temporally extended nature of a good learning process means that whereas the very distant past is often causally inert (because, as John Maynard Keynes pointed out [1923: 80] "in the long run we are all dead"), the recent past is most likely to be redefined by future outcomes, even providing for the sobering observation that a "decision's effects are lost in the general confusions of history" (March, 1994: 168). What may have seemed a brilliant strategic move at a moment in time proximal to its implementation, may turn out to be recast as a strategic disaster years or decades later, when the unintended and/or unanticipated ramifications of that not-so-brilliant move will have materialized (Forrester, 1971; Tucker, 2011; Zwart, 2015).

Interestingly, the discipline of logic has developed a special formalism called nonmonotonic, or non-demonstrative, or defeasible logic, to capture the real-world phenomenon that the addition of new premises to an old set can and will change radically the conclusions that can be drawn from that set (Rescher, 2009). Speaking to this issue with remarkable eloquence, G. K. Chesterton noted (1927: 34):

> The real trouble with this world of ours is not that it is an unreasonable world, nor even that it is a reasonable one. The commonest kind of trouble is that it is nearly reasonable, but not quite. Life is not an illogicality; yet it is a trap for logicians. It looks just a little more mathematical and regular than it is; its exactitude is obvious, but its inexactitude is hidden, its wildness lies in wait.

By bringing out in the foreground and substantiating the observation that a competitive environment is especially difficult to predict, the concept of iterative lagged asymmetric responses makes a contribution to the never-ending and many-pronged debate about the extent to which the future can be forecasted (Armstrong et al., 2015; Derbyshire, 2016, 2017a; Kwakkel and Pruyt, 2013; Phillips, 2007; Phillips and Kim, 1996; Poli, 2010;

Rescher, 1998). Competitive dynamics place a strategic premium on surprise, yet the very notion of surprise presupposes a violation of one's expectations or predictions (Clark, 2013; Lorini and Castelfranchi, 2007; see, however, Derbyshire, 2017b; Shackle, 1970, for an alternative theorization). Actors in competitive environments are bound to decide and act under conditions of uncertainty (Hirsh et al., 2012; Milliken, 1987; Stieglitz et al., 2016) because they rarely have accurate foreknowledge of *how* their opponents will respond (*asymmetry*) and *when* they will respond (*time lags* of unknown duration).

As the foregoing analysis has shown, the concept of "iterative lagged asymmetric responses" encapsulates a coherent collection of potentially useful presuppositions about how the world works that might have broad appeal to scholars of time and temporality, and to specialists in futures studies, strategic management, intelligence and counterintelligence studies, and long-range planning. To the extent that the accuracy of our predictions reflects the quality of our mental representations of how the world works (Csaszar and Levinthal, 2016; Martignoni et al., 2016), the newly proposed concept can function as one of several tools in the toolbox we use for refining and enriching our mental representations of competition in social systems.

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