

# Brief encounters: Calculation and the interaction order of anonymous electronic markets

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## Abstract

Calculation has been recently discussed in relationship to market transactions as: (1) a set of operations, including classifications and computations, which support decision-making processes by economic actors; (2) action plans or strategies which can be evaluated against efficacy criteria; (3) broader social processes which induce behavioral modifications and transformations along (1) and (2). Calculations would appear as situated plans or strategies, bounded by institutional constraints, and anchored in classifications, computations, and evaluations, strategies which are implemented within trading interactions. Such plans make use of available resources and adapt to constraints, but are prior with respect to live trading interactions. Using a conceptual apparatus anchored in the work of Erving Goffman, I argue that calculation is situational action. Its features are shaped by the interaction order of trading, and it can be conceptualized as emerging from gaming encounters—i.e., competitive displays of the participants' socially relevant attributes. These arguments are supported with empirical data from online, anonymous financial trading. In these markets, gaming encounters make anonymous strangers present in the trader's situation, as a basis for assessing the relevance of displays on the trading screen and for reacting to these displays. At the same time, traders engage in repeated self-displays as a means for defining their own situation and for projecting subsequent action sequences.

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## Introduction

Calculation has emerged in the recent debates about (financial) markets as re-focusing the analytical attention away from social-structural aspects of market exchanges (such as ties within networks and groups) to the processes through which trading strategies are worked out in trading rooms (e.g., Beunza & Stark, 2005, p. 92). Calculation has also been tied to the concept of

agency, designating the incorporation of scripts for practical actions in (formal) economic representations and technologies (e.g., Callon, 2004, p. 123; Callon, 2007, pp. 337–338). Calculative agency highlights the role of commonly held distinctions and classifications in making economic entities suitable for formalization (and for the operations implied by this latter, including comparing, ranking, and computing) (Callon & Muniesa, 2005, p. 1231; Muniesa & Callon, 2007). Markets appear thus as “calculative collective devices,” emphasizing the common effort put by groups of market actors into reaching various

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degrees of consensus on value. At the same time, calculative practices (different from calculating devices) emphasize the social processes through which specific rationalization procedures becomes institutionalized within organizational structures (e.g., Miller, 2008, p. 53). These procedures, in their turn, can change organizational dynamics, the relationships between organizations and political institutions, and can lead to the emergence of expert bodies which set up implementation standards.

At least three notions of calculation are implicit in these arguments: the first is that of cognitive operations, including classifications and computations. Such operations have a sequential character, are iterable, and their outcome can be estimated and anticipated. The second notion, which includes, but is not limited to the above, is that of selecting, projecting and evaluating the outcomes of market transactions. Calculations are seen as strategies involving expectations about other actors' beliefs, the evaluation of alternative courses of action, as well as criteria for selecting and implementing courses of action. Trading strategies rely on classifications, the processing of numerical data, as well as criteria and procedures for the optimization of means with respect to transaction goals (Biggart & Castanias, 2001, p. 473). For instance, the manipulation of numbers contributes to the reliability and accountability of strategies. Finally, calculation designates the social processes through which entities are selected and transformed in such a way that they become the object of market transactions submitted to efficiency criteria. These processes create institutions—sets of rules incorporated in artifacts and organizational structures—which provide the resources for, as well as the constraints of (financial) transactions (Miller, 2001, p. 380).

From the perspective of financial transactions as live and lived interactions, then, calculations appear as strategies (or action plans) implemented in the interaction order of trading. Is the latter then something external with respect to such plans—a setting in which plans are realized—or is it intrinsic to the features of transactions? More generally: what is the relationship between calculation and trading interactions?

An appropriate instance for examining these questions is that of anonymous, online financial markets. In some situations at least, the interaction order seems to be reduced here to a bare minimum.

Lay online traders<sup>1</sup>, for instance, anonymously trade financial securities on electronic platforms on their own account, earning all or a considerable part of their income from online trading activities. They are not part of any organization and are not employed in any capacity by any financial institution. Organizational habitats are part of the traders' system, but not of their lifeworld, understood as the traders' primary reality (Habermas, 1987; Schutz & Luckmann, 1974, p. 35). Moreover, anonymous electronic transactions are click and trade, not talk and trade. In a certain sense, online anonymous trading seems to come close to the normative model of isolated, calculating individuals making choices based on their strategies. By studying the apparently minimal interaction order of lay online trading, we can investigate whether calculation consists of implementing strategies or not.

In the following, I examine the above questions based on ethnographic observation (including audio and video recordings) and interviews with lay online traders. In the first step, I elaborate the theoretical frame of the analysis to follow. I argue that calculation remains an interaction-based achievement and can be best conceptualized as a relational and situational activity. It should not be understood as the mechanistic application of a plan or formula. Building upon Erving Goffman's concept of encounter, I suggest that in anonymous online markets calculation emerges from gaming encounters geared toward the display of the participants' socially relevant features. Secondly, I present the methods and the data on which this paper is based. Afterwards, I shortly present the technological and institutional developments which support lay online trading, as well as some basic elements of their trading activities. Fourthly, I show how lay online traders calculate trades based on at least two interaction achievements: projection of the self and actualization of other presences in the given situation. In anonymous, online financial markets calculation does not appear as the application of a plan or formula, or a strategy whose outcomes are checked against projected results. Calculation emerges from gaming encounters with anonymous strangers. It

<sup>1</sup> Lay traders are usually referred to in the popular media as day traders. This term is perceived as pejorative; moreover, day trading designates a set of specific techniques not always used by lay traders. Therefore, I will refer throughout this paper to lay, in the sense of non-professional, albeit full-time or near full-time traders.

requires bodily work different from that of face-to-face encounters. Its main prerequisites are the stabilization of the screen and the definition of specific situations. The screen appears as an observational instrument, as well as a portal through which anonymous traders “cross over” into each other’s situation. Since the display of social attributes is achieved, among others, through price variations, this contributes to explaining the price volatility observed in electronic markets.

### Calculation, plans, and the interaction order

Calculation as planned action implies that actors implement rule-based sequences of activity which can be evaluated against criteria of efficiency. With respect to financial trading, for instance, such sequences include establishing the objective, considering alternative courses of action, computing the likely outcomes and enacting the outcome “that optimizes risk and return according to pre-determined decision criteria” (Fenton-O’Creevy, Nicholson, Soane, & Willman, 2005, p. 79). This division between devising a trading plan and implementing it seems to resonate with an organizational division of labour between fund managers, for instance, who draft plans, and traders implementing such plans under specific constraints. Planned actions can require the use of various technologies of evaluation and execution (e.g., charts, software programs), the application of formulas, informational inputs and data processing activities (e.g., analyses, access to price data), as well as webs of relationships, exchanges, and collaborative processes (as provided, for instance, by the division of labour found on trading floors). Organizational contexts can provide the resources for planned actions, but they also set constraints upon them: for instance, organization-based networks of relationships can function as the pipes (Podolny, 2001) through which information flows, while also setting boundaries to the circulation of information.

While institutional constraints and resources (Abolafia, 1996), adhesion to analytical tools or styles (Smith, 1999), judgment biases (Fenton-O’Creevy, Nicholson, Soane, & Willman, 2005, pp. 83–86), as well as intuitive elements (Zaloom, 2006, p. 136) can affect the concrete courses of trading, the planned element is nevertheless crucial. This element concerns not only the sequentiality of trading activities (from planning to implementation and evaluation), but also the fact that, at any given time in the process of

trading, rules and criteria can be separated from the lived activities which embody them. Traders’ post hoc accounts and rationalizations could be seen as empirical evidence for this separability, assuming that such accounts would be identical with what traders actually do. The analytically-minded observer could then detach and analyse calculative elements from actual actions, and evaluate the latter against the former. Moreover, calculative elements would have to be prior to the concrete, live trading: while this latter may introduce modifications and adaptations, the plan would need to be recognizable as such (Suchman, 1987, p. 36) and implemented by the trader.

From the perspective of the interaction order, then, trading would be situated calculation. Situational resources and constraints may make traders adapt or revise calculations; they may impede upon traders’ choices, as well as upon their evaluations. Nevertheless, such resources and constraints would appear as external with respect to trading plans or strategies. An observer should then be able to identify and describe at least three distinct phases of calculation: plan preparation, plan implementation/adaptation, and evaluation. Whether such a distinction can analytically and empirically hold depends, among others, on a closer examination of the interaction order of trading.

### Calculation as a situational and relational activity

Financial trading is a relational activity, implying an orientation toward, as well as exchanges with other market actors, and relying on observational technologies: computer screens, display boards, and the like. The possibilities for (direct or mediated) action imply zones of operation in which actors effect changes (Schutz & Luckmann, 1974, pp. 36, 44), the boundaries of which are shaped by technology. The shared expectations which underlie transactions draw on local resources, physical as well as human, verbal as well as non-verbal. From the perspective of the individual actor, the assumption that participants will draw on a pool of shared (and largely not explicit) expectations is itself crucial with respect to the possibility of action. Accordingly, trading as a relational activity is not only situated, but also situational (Goffman, 1983, p. 9): that is, the resources of the situation are not simple vehicles for a strategic activity or a plan whose definitional features remain independent of these resources. It is not the same whether traders receive

price data on their screens, through shouting accompanied by hand signs, via a formal letter at home, or on a paper slip left under the doormat.

In anonymous, online “click and trade,” direct verbal or bodily interactions with other traders are not part of situational resources. The screen displays alphanumerical data, of which price and volume are seen as the most important. As an observation and manipulation zone, the screen constitutes the trader’s “kernel of reality” (Schutz & Luckmann, 1974, p. 42)<sup>2</sup>. While in some cases the screen enables conversations-qua-transactions (Knorr Cetina & Bruegger, 2002, p. 913), in anonymous trading the screen fulfills a dual role: as a board on which anonymously posted displays can be observed, and for posting the trader’s own data.

Observation of price data is not identical with gazing at the screen. It implies awareness, or selected availability of what is being seen (Heath, Sanchez Svensson, Hindmarsh, Luff, & vom Lehn, 2002, p. 321). Observing a particular price data or accepting a transaction (i.e., clicking a button on the screen for a specific display) can be seen as an acknowledgment and validation of the presence of another trader which, for a moment, becomes relevant. Other traders, however, are anonymous strangers, whose position is characterized both by remoteness and closeness (Simmel, 1971 [1908], p. 145). They are remote not only in the spatial sense of the word, but also because of a lack of any information about their identity, interests, or intentions, as well as of the absence of any personal relationships, of the kind institutional traders can develop (Knorr Cetina & Bruegger, 2002, p. 941). They are close in the sense that traders must work with the assumption of basic similarities (of knowledge and interests) between them and their unseen counterparts. But they are close also because traders, in order to transact, must face unseen strangers as being there. The data flickering on screens are taken as representations (Husserl, 1995, p. 112)—representation and perception fused together—of the traders displaying them. Thus, anonymous strangers have to be co-present in the trader’s situation.

The acknowledgment and validation of anonymous strangers, however, cannot be based on an

immediate and direct orientation to their presence. First, strangers are remote and do not have a face. Second, they display in a fleeting manner. Third, they compete for the trader’s attention. The very limited range of resources displayed on the screen (price and volume data)<sup>3</sup> requires a trader to draw upon additional means in the process of acknowledging and validating other presences.

Such means cannot be seen as a set of universal, fixed rules, of the kind implied by the equivalence between calculation and strategy. First, fixed rules would not do justice to permanently changing displays. Second, they would have to come from somewhere; neither the screen nor the (organizational) context provides them as a resource.<sup>4</sup> Third, they would have to stabilize the presence of other traders as significant, even if for a moment. A plan or a formula (as part of a plan) can hardly provide for this, since it cannot include *ex ante* criteria for evaluating significance.<sup>5</sup> In order to do this, a plan would have not only to foresee the order in which data will flicker on the screen, but also their value. In a similar manner, if we understand calculation as the application of a formula (which generates data), then that formula would have to contain the criteria according to which the significance of the generated data could be evaluated. For instance, if we see calculation as the application of a formula for options prices, then this formula would have to establish the significance of theoretical prices in the same manner for every trader. A plan would have to provide omniscient anticipations of other traders’ actions, anticipations which would be then embedded and adapted within the interaction order. If a plan or calculation cannot be taken as distinct from the interaction order in which it is enacted, then it

<sup>2</sup> Relying on Mead, Schutz and Luckmann distinguish between the manipulative zone and the zone of distant things. In the manipulative zone, objects can be seen and touched, whereas in the zone of distant things objects can be seen, but not experienced via live corporeal contact.

<sup>3</sup> Traders have the possibility of inferring categorical identities from this data (e.g., whether displays are made by individual or by institutional traders); they also have the possibility of asking the brokerage house to reveal post hoc the identity of their counterparts for specific trades. This identification is a longer bureaucratic process which can unfold only after the trading moment, when it had lost relevance. The observed traders do not use it, preferring, for all practical purposes, anonymity.

<sup>4</sup> Science and technology studies point to the ways in which plans, such as engineering blueprints, schemes, drawings, etc. can act as props for action. These are not simply representations or sets of instructions for actors, but rather technologies of social interaction (for a recent example, see Vertesi, 2008).

<sup>5</sup> This resonates with Ludwig Wittgenstein’s (Wittgenstein, 1984, p. 416) critique of calculation as the application of a formula.

would have to be intrinsic to the trader's orientation.

This orientation, however, is not an a priori with respect to action, but established within the interaction order.<sup>6</sup> If such rules or plans exist at all, they would have to emerge in this order—which contradicts the presumption of generality and universality. Within this context, calculation can hardly be seen as following a given set of instructions: such a set is not part of the resources at hand. Even assuming its location in the actors' consciousness, it could not support action without a set of instructions for correlating rules to the resources of the situation. From here on, however, infinite regression sets in, since correlation would require in its turn a set of specifying rules, etc.

### Calculation and trading encounters

I will contrast now plans with the notion of encounter, as developed in the work of Erving Goffman. While plans and strategies are intrinsic to games (which, indeed, have often been equated with calculations), during the play of a game a variety of relevant interactions occur, which cannot be defined in terms of the game's rules (Goffman, 1972, p. 33). This variety can be seen as a gaming encounter: a play of a game of chess, for instance, is a special abstraction from the gaming encounter between specific players. As usually presented in chess manuals, these plays abstract, select, and re-work concrete interactions into schematic visual representations of moves. It is this re-working which allows the reference to plans and strategies. Glances, bodily movements, worded exchanges, or tantrums are left out, enabling the codification of chess encounters as plays of the game of chess, with the latter being analyzable in terms of moves, counter-moves, and strategies.

If, however, we regard the gaming encounter as relevant for what is going on in the play of a game (what Goffman calls an occasion for gaming), elements such as protests, interruptions, gestures, or glances form an organic system of interactions highly relevant for the outcome of the encounter (and hence of the play). A participant's actions, then, cannot be seen as the implementation of a strategy, but as a situational reaction to the previ-

ous action turn. A gaming encounter can be characterized by a problematic outcome and by sanctioned displays of socially relevant attributes (Goffman, 1972, p. 61), such as dexterity, endurance, self-control, resilience to humiliation, and the like. Games, then, can be seen as arrangements or conventions for "integrating into gaming encounters ... socially significant externally based matters" (Goffman, 1972, p. 64), centered around specific sets of routines. Gaming encounters of chess, for instance, include sets of routines executed during competitive displays of social attributes. In such displays, participants can switch across various keys (Goffman, 1974, p. 49) in which they perform their routines. In a game of basketball, for instance, a player can switch from a dribble to a mock pass (a make believe) in order to confuse his opponent; such re-keyings can be part and parcel of gaming encounters.

The competitive display of social attributes resonates with Clifford Geertz's notion of deep play (1973, p. 433), in which cockfight routines provide the occasion for engaging in status competitions by way of betting. In other words, gaming encounters bring forth value-relevant issues, in relationship to specific conventions and routine-like procedures (such as those of football, or chess). In a chess encounter, for instance, such value-relevant issues can be "unflippability," endurance, or quick response. Apparently unrelated gaming types, then, can provide occasions for similar value-relevant issues (think of rugby, car racing, and chess, for instance, with respect to endurance, among others).

Face-to-face gaming encounters can be characterized by symbolic distance from the environment in which they take place (Goffman, 1972, p. 65)—card games are a case in point here. In card games, participants sitting around the table distance themselves from their audience, which may have the right to look, but has to remain silent, is not allowed to intervene, give advice, etc. The audience is then spatially near the players and symbolically distanced from them. In other kinds of encounters, not only that the opponents/partners are not known, but their relevance as opponents/partners is not known (blind speed dating can be such an encounter). In instances of online trading, the relevance of somebody being a partner is not known previous to them displaying on the screen. This prevents the gaming encounter taking symbolic distance from the environment. The traders have to use environmental

<sup>6</sup> Similarly, in auctions prices emerge within the participants' interactions (Heath & Luff, 2007, p. 81).

resources—the screen, among others—in order to establish this relevance. Symbolic closeness replaces distance. The same can be illustrated with floor-based trading v. online trading. In the former, the status and identity of competitors is known before they make the first hand sign (Zaloom, 2006, pp. 98–103). The pit is symbolically distanced from the clerical desks and phone booths situated only a couple of steps away. In online trading, this relevance must be inferred from the screen displays, without the latter providing enough resources for establishing this relevance. Hence, the encounter must be kept close to its environment. Online trading can then be re-keyed in ways in which floor based trading can not: it can be re-keyed as café encounters (such as observed by this author, among others), or as household encounters.

The resources used by a trader in acknowledging and validating the significant presence of anonymous others cannot come but from the situation of which the trader is part. A major resource is the trader's own presence. A basic form of addressing the presence of the other is when the actor "replies to himself as truly as the other person replies to him" (Mead, 1964 [1934], p. 203). In carrying on a "conversation of gestures" (Mead, 1964 [1934], p. 205) with herself, as well as in talking to herself, the actor can use her own presence as a resource for establishing a meaningful orientation to the presence of (remote) others. Self-talk does not emerge as indulgence or taboo breaking (Goffman, 1978, p. 788), but as a way of embedding the assumed presence of other actors into the trader's situation and context of action. Similarly, the presence of familiar persons (or of familiar strangers) in the situation can be taken both as an occasion and as a resource for bringing remote, anonymous, strange traders into the situation. By addressing others present in the situation, or simply by taking the presence of others as an occasion for addressing herself, the trader can momentarily stabilize apparitions on screen, and validate them as significant.

Against this background, online trading encounters are anchored in the orientation toward other potentially relevant presences, and toward oneself (as a major situational resource). This action extends into the future: its aim is to process given elements in order to obtain a result which can be significantly related to other results, obtained through past operations. Displayed data must be processed in such a way that the results of these activities

can be connected to each other. Processing displayed data, in its turn, depends on actively adding, deleting, or combining existing data in new configurations and evaluating their relevance. It also depends on selecting and actualizing some displays as relevant in the given situation, while others are overlooked. This actualization process implies bringing the displayed data into the trader's situation, relating it to her own actions as relevant. It is a process of actualizing the actions of absent, anonymous traders as relevant for one's own future actions. Finally, these actualized presences have to be endowed with minimal stability, in order for one's own actions to unfold. Even if only for a brief moment, they must be maintained as significant. In order to achieve this, trader would use the most elementary resources at hand: their own bodies and voices.

The trader's display to others cannot exclude from the start socially relevant attributes; numerical screen displays have existential qualities (Vollmer, 2007, p. 593) and intervene therefore in establishing social relationships. Endowing other, unknown presences with significance as the basis for actions is related to the display of such attributes through numerical data. Traders must show that they are "there"; they must show that they are attractive to others. Endurance, even obstinacy, coolness, or attractiveness have their place among these attributes.

In online financial markets, then, calculation emerges from encounters rather than the application of a plan. It emerges as the execution, adaptation, ongoing combination, and modification of specific routines (e.g., buying a put, selling a call on an index) according to the requirements of the encounter. Encounters can be seen as social relationships of short duration, characterized by competitive displays of socially relevant attributes, and having uncertain outcomes. In online trading, where participants engage with anonymous strangers through the computer screen, social attributes cannot be displayed directly to anonymous others. They can, however, be displayed in strips of actions, like posting numbers on screen, or reacting (or not) to the numbers posted by strangers. Trading encounters would have therefore at least two dimensions: the actualization of other presences in the trader's situation, and the trader's self-displays to others on the trading screen. Trading encounters are symbolically close to the environment in which they unfold. They involve bodily engagement with

strangers, an engagement mediated by the screen.<sup>7</sup> Since the execution of trading routines requires ongoing adaptation to the characteristic of specific encounters (i.e., to competitive displays of attributes), it follows that transaction sequences cannot be foretold. These sequences will vary not only from market participant to market participant; they will also have an intrinsic variability, due to the necessity of adapting them on an ongoing basis.

## Methods

An appropriate way of spelling out the empirical underpinnings of the above propositions would be to look close up at how calculations unfold in the live process of trading. The aim is not finding representative frequencies of types of strategies. (What is taken as a strategy often reveals itself as a post hoc rationalization.) Best suited for such an examination is naturally occurring data (e.g., Schegloff, 1996, p. 167)—that is, observational data obtained from online anonymous traders in their natural habitat. Instead of asking lay traders, for instance, if and how they calculate while trading, visual and audio recordings of the trading process itself, together with protocols of participant observations<sup>8</sup> can be used in order to identify and analyze calculative processes. This can be complemented with interview data providing more background information about the traders' past experiences, about the constraints under which they operate, and the like.

Gaming encounters do not necessarily include verbalizations and explanations of actions performed by traders. Nevertheless, the presence of the ethnographer can be taken as an occasion for thinking aloud, or for providing accounts—that is, evaluative inquiries (Scott & Lyman, 1968, p. 46) of what is going on, while it is going on. In such cases, the ethnographer's presence can act less as a disturbing or distorting factor and more like an occasion—and resource—used by traders in formulating what they are doing. This means that traders

will seize upon the presence of the ethnographer as an occasion for glossing upon what is going on, and for making dialogues with unseen trading partners audible, dialogues which otherwise may take place in *petto*. Especially since such formulations are uttered in the process of trading—where so much is at stake—they should not be seen as performing for the benefit of the ethnographer, but as concretizations of encounter moments (i.e., as making them audible). Any performance for the benefit of the ethnographer would mean here interrupting an ongoing on-screen gaming encounter and engaging in a face-to-face one. Such shifts would be disruptive; they would be observable, and would require repair. It is the interaction itself (i.e., the presence or absence of such repairs) which indicates whether the presence of the ethnographer is an occasion for audibility or a disruption of on-screen encounters.

An additional, appropriate way for checking upon such moments is to examine interaction strips where the ethnographer is absent. By recording trading days without the presence of the ethnographer, we can see whether verbalizations occur as intrinsic to the trading process or not. I have done recordings of full trading days (a total of 10) without my presence and checked them against recordings of trading days when I was present. The comparison shows that traders verbalized interactions even when they were completely alone. The presence (or intervention) of family members did not appear as a disruption, but as an occasion for commentary, evaluations, and for making audible strips of inner dialogue with unseen transaction partners. Comparing the presence/interference of family members with the presence of the ethnographer, disruptions or modifications of the trading process were not recognizable in either case.

The following analysis is primarily anchored in data obtained through observation of lay US traders in the period October 2005–March 2007, and consisting in video and audio recordings of trading, together with protocols of participant observation. The traders used US-based electronic platforms; nevertheless, as they traveled, observations and interviews with the same traders were made both in the US and in Europe. The data discussed here consist of the following: extensive recordings of trading days (over 82 h of recordings); video recording of trading with observation protocols (over 3 h); observation protocols without recording (over 9 h); observation protocols with audio recording (over 7 h); interviews (over 40 h).

<sup>7</sup> Conversely, in boxing, which is apparently exclusively body-centric, talk plays a significant role (Wacquant, 2004, p. 66).

<sup>8</sup> While protocols of participant observation cannot be considered naturally occurring data in the strict sense of the word, they can capture situation-relevant elements which cannot be retained by an audio recording, such as gestures. Video recordings certainly allow the analysis of such elements, but they offer mostly a restricted angle, not identical with the vision field of the observer. In many cases, a combination of video recordings and participant observation has the potential for better data yields.

The use of this combination is motivated by the necessity to: (a) check interaction consistencies; (b) complement audio data with visual ones, thus getting access to behavioral detail (Peräkylä, 2006, p. 95); complement audio and video data with interviews, gaining thus insight into the traders' operating context, background, and self-perception. In addition to participant observation, recordings, and interviews, this author has attended training and presentation sessions organized by the electronic brokerage firm used by the traders. The sessions were aimed at introducing lay traders to the trading software and brokerage services of the firm; they were organized in cooperation with and on the premises of a global stock exchange.

Before a step-by-step discussion of various aspects of calculation within the interaction order of anonymous online trading, a presentation of the *modus operandi*, the constraints, and the systemic possibilities available to lay traders is necessary. Understanding the *modus operandi*—that is, the way in which traders assemble, modify, and preserve the trading screen—as well as the financial and material constraints under which they operate is essential not only for grasping their various activities, but also for how calculation is grounded in the interaction order of trading.

### The framework of lay online trading

Non-institutional (or lay) traders are individuals who do not belong to a financial organization and trade full- or part-time on their own account. Observations suggest that an offline non-institutional trader will trade at least 4–5 times per week. The Securities and Exchange Commission (SEC) has now a formal, frequency-based definition of lay online trading, but there is no such definition for offline trading.

Traders use the services of brokerage houses (electronic or not) in order to transact stocks, commodities, indices, currencies, or derivative products thereof, among others. While the historical dynamics of lay trading still awaits sociological attention, in the late 1990s some traders took advantage of the widespread availability of electronic communication technologies (e.g., the Internet, trading software, electronic trading platforms) and switched to transacting financial securities online (see also Schatzki, 2002, pp. 157–161). Many lay traders use the Nasdaq (National Association of Securities Dealers Automated Quotation) system, which is

over-the-counter (i.e., not tied to a centralized auction system) and was already entirely automated in the late 1990s.

The Securities and Exchange Commission (SEC) estimated the number of full time lay traders in the US (called day traders)<sup>9</sup> at about 7000 and their share at 15% of the total Nasdaq trading volume, while the number of brokerages was 133 (SEC, 2000, sections III.A, III.B). In 1999, the then SEC chairman Arthur Levitt had defined the day trader as “an individual, not registered as a broker-dealer or as a registered representative, who trades stock at a firm that allow[s] the individual real time access to the major stock exchanges and the Nasdaq market” (SEC, 2000, section III.C). Characteristic for day traders is their non-institutional, organization-independent status (the legally relevant distinction from professional traders also makes difficult to estimate their total number).

Using data compiled from brokerage houses, the SEC estimated that most day traders (57%) were between 30 and 45 years; more than half (53%) earned over \$100,000/year and 78% had a net worth of \$200,000 or greater (SEC, 2000, section IV.C). Discussing more stringent margin requirements, the SEC defined the “pattern day trader” as “any customer that executes four or more day trades<sup>10</sup> within five business days, provided the number of trades is more than six percent in the account for the five day period,” and proposed a new rule to the effect that pattern day traders will be required to maintain a minimum equity of \$25,000 at all times (SEC, 2000, section IV.H.1). Judging after the continued revenue growth of electronic brokerages in the early 2000s (accompanied by continuously falling fees), the cautionary tone of the SEC does not seem to have deterred lay traders.

We can distinguish at least among three meanings of “day trader”: (1) a non-institutional trader working on her own account and using her own

<sup>9</sup> The term day trader is present in the academic literature since at least the early 1980s (e.g., Van Landingham, 1980), but with a different connotation, determined by the opposition with buy-to-hold investors. The distinction lay/professional is missing here.

<sup>10</sup> “Day trades” implies here that the traders buys and sells the same security within the trading day. Observations suggest, however, that this is not always the case; lay trading is not restricted to, and does not necessarily imply buying and selling the same security within one day. This technique is sometimes used by lay traders and designated as such—i.e., day trading. In interviews with lay traders, these considered day trading as risky and (even when practicing it) not to be recommended.



financial means; (2) the repeated buying and selling of a security within one trading day; (3) a regulatory classification of the SEC, imposing a set of specific restrictions with regard to capital and margins on (1).

Lay online trading has been rather favored by several recent technological developments. Among the most important are: (1) the adoption of a new encryption standard (the AES, or Advanced Encryption Standard) in 2001 (e.g., Landau, 2000)<sup>11</sup>; (2) the spread of ADSL, modem and high-capacity cable networks, which has facilitated real time (or near real time) transmission of financial data outside networks of professional institutions, contributing to lower trading fees (from \$15–25 per trade in 2000 to \$1 and less today); (3) the expansion of electronic communication networks (ECN)—i.e., of computer-mediated financial transaction networks; (4) the expansion of US-based electronic brokerage houses.

### The screen as an observational and as an encounter device

In the cases discussed here, lay traders logged in on a NASDAQ level II screen, which looks like a grid of differently colored cells, revealing the bids and offers for every anonymous market participant posting quotes. The first three columns contain the security's trading code, the platform/exchange on which it is tradable, and the expiry date (for derivatives). The next columns provide information (in this order) about position, average cost, quantity unrealized, bid size, bid price, ask size, ask price, last size, change, last price. The amount of data which is visible at once depends, however, on screen size, and this is an important limitation.<sup>12</sup> In addition to information about bids and asks, traders can choose to display information about their asset balance and liquidity, which is automatically updated. Due to the physical limitations of the screen, multiple windows can display various kinds

of information: price charts, news, expert recommendations from specialized services, or a chat room. This latter capability was not used by the traders observed by the author.

The possibilities offered by the trading screen indicate that not all activities of traders are calculation: searching for news, perusing of expert recommendations, accounting of past relevant events or interpretation of charts are some of the activities which take place during a trading day. Yet, among the most important moments are those of engagement with other traders. They are important not only because there is considerable more excitement, and sometimes even tension, in such encounters, but also because the trader's financial situation changes as a direct consequence of them.

On a trading screen interface, 325 active cells (25 rows and 13 columns, arranged in a grid) are visible at once. The interface can contain many more cells, but they will not be visible without scrolling down. It also has several (usually five) rows of buttons (situated at the top of the screen). When a button is hit, a new window pops up, showing new sets of data, or triggering a different activity: for instance, the trader has "news," "ticker," and "chat" buttons at the top of the screen. The active cells contain numbers and letters, but some of them can also be used as buttons: for instance, an order is transmitted by transforming a data cell into a button and hitting it. In this case, the letter "T" will appear in the cell on a colored background. Additionally, a sent order can be cancelled by transforming an adjacent data cell into a button and hitting it. (The letter "C" will appear in this case in the cell against a colored background, different from the "T" one.) The usual background color of the trading interface is white (on the left side) and black (on the right side). Colors of letters, numbers, and cell buttons can be chosen by the trader, who can also program different acoustic signals to be triggered by specific events (e.g., when a sale occurs).

The trading interface contains thus three areas: the button area at the top, shaded in grey; the white area on the left hand; the black area on the right hand. The grey and white areas occupy each about one-fifth of the computer screen. The black area takes the other three fifths. This is also the zone which necessitates the most attention and effort from the trader. The grey area contains buttons corresponding to various activities (read news, or get more data, or get other kinds of data) which, in their turn, are contained on different screen inter-

<sup>11</sup> While investment banks and exchanges operate secure intranets, lay traders depend on secure broadband connections and on commercial encryption software.

<sup>12</sup> Some of the lay traders observed were conscious about this physical limitation and were considering working with a second screen, in a manner similar with professional traders. Other traders worked indeed with two screens. The fact that notebook computers, with which many lay traders work, have smaller screens, increases these physical limits to the amount of available information.

faces. The cells in the white zone contain acronyms of financial products, the name of the trading platform, and expiry dates of derivative products. Observation and trading do not necessarily overlap: for instance, if traders transact derivatives, they will also put the underlying asset in one of the top rows, in order to monitor it. The cells in the black area will contain specific data for each of the names in the white area: price (average, limit, bid, ask, last), quantity in hundreds (unrealized, limit, bid, ask, last), profits and losses, status, and destination, among others. The cells can be transformed into active buttons: when traders want to send orders, the ask price cell will become a transmit, or T-cell, while the ask size cell will become a cancel, or C-cell. The data contained in columns is not necessarily of the same kind: for instance, the first five or six cells in a column will contain data about the bid size, the next five or six data about limit prices, after which the cells will revert to bid size.

During market hours, the cells in the black zone of the screen can flicker at once, at a perceived frequency of up to 4–5 times per second: this is because the data display changes in color, length, and content. Not only that the same type of data varies within a cell, but a cell might display a certain kind of data, of a certain length, and in a certain color (e.g., bid size), and, in a fraction of a second, shift to displaying a different kind of data, of a different length, and in a different color (e.g., limit price). Thus, for the same cell or location, the trader is confronted with sensory variations (color and length of data sequences) which have to be related to intra-data changes and/or to shifts across data types, according to situation. Additionally, these changes occur simultaneously in different cells in the black zone of the screen. Monitoring them is crucial and takes the most time of online traders. Not only that the trader's financial situation and status depend on the accurate monitoring of the screen (and especially of the black zone); any transaction traders may want to conduct is built upon and depends largely on uninterrupted monitoring. In fact, about 90% of the trader's active time, if not more, is spent on such monitoring.

From the viewpoint of the trader, each flicker is a display of action competing for attention with other displays. It indicates that somebody has posted something. The general notion of "stuff is happening" is still far from the awareness of a presence which can be acknowledged and validated by the trader as significant. A flicker can become a pres-

ence only when brought into relationship to the trader's positions and orientation. In order for this transformation to take place, the remote stranger has to be brought near. While the trading screen provides some elements to trigger and support this transformation, they are not enough. Moreover, the screen is a fundamentally unstable object, flickering all the time, without any apparent rhythm or overall, precise, underlying rationale. This instability is amplified by traders who, in the search for meaningful presences (but also in response to constraints) continuously modify the composition of the screen.

The screen appears thus as a laminated object (Goffman, 1974, pp. 82, 156–157), framing together various layers of activity, some of which are oriented toward anonymous strangers, and some toward searching for information which should enable this orientation. Some of these layers enable contemplation, some enable experimentation, and some enable engagement. Some zones of the screen contain durable data (e.g., the codenames of securities), while others contain highly variable data (e.g., prices and volumes). Traders can set up different combinations of securities to be observed, can increase the number of combinations, and can seek out encounters with various combinations of trades. Thus, at any given time, each trading screen is unique, in the sense that it incorporates unique combinations of anonymous presences and unique responses to them.

### Calculation as bodily work and material coordination

Orientation toward, and interaction with the screen is crucial for engaging in encounters. The traders' attitude is far from a passive, contemplative one. Observing the screen is more than "looking at"; it implies physical closeness and active bodily engagement:

- 1 Trader: [16"] [points finger to screen cell with underlying asset on which he trades puts]
- 2 still there quite a bit though I mean [moves cursor up] .hh but I have stuff next month so.
- 3 hh [13"] [brings cursor back down] [moves cursor up opens portfolio window] not a
- 4 pretty month for me .hh I'll say that much [4"] that might not be as bad as it looks, I
- 5 mean [points with finger to index cell] if that finishes even above seventyseven [2"] it

6 will wipe out all these [points with finger down to  
row of puts he has put up for sale] you  
7 know I mean I won't have to buy'em back↑  
[opens again portfolio window] but that's the  
8 problem with getting the squeeze, you know what  
I mean

In the above sequence, the trader must decide whether to buy back a bunch of puts he has sold earlier. He must decide upon (or calculate) the implications of his actions, with respect to present, as well as to future situations. Calculation appears neither as a set of purely mental operations, nor as the application of a plan. It is not recognizable as the implementation of a (standard) move, nor taken as such by the trader. In order to establish what they are going to do next, traders have to define their situation at a given moment. Defining the situation, however, is not simply a matter of words: good, bad, acceptable, etc. Nor is it a matter of comparing data with a template, or of evaluating them according to a set of criteria. It is a matter of identifying relevant spots on the screen and correlating across spots, so that actions can be adapted to an ever changing display with multiple, coordinated sites, where relevant encounters might happen. Manipulating numbers is contingent on downkeying them (Vollmer, 2007, p. 587)—that is, on identifying them as relevant spots on the screen. Adjectives alone cannot do justice to such a situation; traders have to use their body in order to coordinate with the experimental device. Hitches, response cries (Goffman, 1978), and hand movements are used to mark places and moments of relevance for future actions and to support calculations. The entire body, although strapped to the chair, is geared toward such operations: leaning forward, pointing at the screen with the finger, clicking the mouse, sighing are as many bodily actions marking relevant moments in calculative activities.

This marking is important in an ever changing environment, and allows the trader to stabilize, even if only for a moment, the spots on the screen which need to be correlated and accounted for. The very activity of accounting for a screen flickering—intrinsic to encounters—cannot dispense with bodily work. In the lines 5–6 above, the trader does exactly this—he projects the relevance of a spot on the screen for his future situation by engaging his body in interaction with the screen (through coordination of hand and eye movements with vocaliza-

tions) and by glossing upon his own movements in connection to screen spots. In this perspective, encounters are prepared and sustained by material and discursive coordination with the device, based on stabilizing observations, on defining situations, and on projecting future consequences of present situations.

On the trading floor, encounters imply a heavy amount of body work, including elbowing and shoving aside, when necessary (Zaloom, 2006, p. 136). In the trading rooms of investment banks, trading also involves coordination with other traders and with the screen. Even in situations like the above, stripped of any immediate organizational environment and of physical co-presence of other traders, bodily engagement is still required by encounters.

### Calculation as anonymous encounters

Within the experimental field incorporated in the trading screen, participants display their trades, waiting for an anonymous stranger to appear and engage with them. Before this happens, traders cannot know whether their posted trades are relevant to others or not. Knowing this, however, is essential for deciding upon future trades: which products, at what prices, and for what expiry dates (in the case of derivatives) should traders post? The answer depends on the success of the trades already posted, as well as on the traders' reactions to anonymous others. Engaging with others is essential for evaluating the relevance of numbers seen on the screen, as well as for the question “what to do next”? Engagements imply making others present in the situation, in spite of their remoteness and anonymity.

One tool for bringing strangers in is talk: by talking to absent strangers, traders create the conditions for calculating their trades neither as abstract and impersonal computations, nor as the application of a pre-established plan, but as responses to relevant presences. The encounter, however brief, stabilizes the numbers flickering on the screen and enables their manipulation and rationalization as responses within an interaction frame. Transactions come out of such brief, anonymous encounters, which can be framed by soliloquies. Like somebody waiting in the street for a blind date which may be late or could fail to appear, and who eyes unknown passersby asking in petto: “is this the one?”, “This one looks like s/he might be, etc.”, traders project relationships by means of internal conversations

(Mead, 1934) and act depending on such projections.

Making strangers present in the situation can require addressing them, talking to them, as indicative of the acceptance or refusal to engage. Such talk, which cannot of course be heard through the screen, often includes response cries, marking relevant moments in the encounter (Goffman, 1978, p. 814; see also Hutchins, 1995, p. 313):

Trader: [15"] hah. [10"] [music playing] Raking in the cash!↑ haha↑ I'm taking cash for risk. Hrrh hah. Dim digidim digidim dim dim [slaps hand] [32"] Ohkay.↓ Ohkay.↓ We're going to learn how it works out. Haha haha hh. [45"] [music playing, tapping, computer sounds] Ohkay.↑ I'm not having that kind of day, bud. hihhi Give me a call. [pushes chair]

The trader is here completely alone. He has just sold a batch of derivatives when an anonymous presence on screen attracts his attention: he refuses to engage in the encounter (that is, to take the trade posted by the stranger) by addressing this directly, as the "bud" who should maybe call later. It is not recognizable here that the refusal is part of an overall strategy of rejecting particular kinds of trades, or that it follows any criteria for evaluating the implications or the attractiveness of the posted trade. The rejection comes because, after having sold, the trader does not have "that kind of day." This is linked to what had happened immediately before, not to any general decision-making frame. It should be noted here that the outcome of the previous transaction is still open, but it is the previous successful encounter which makes the trader declining a new one. Display of disinterest as a socially relevant attribute, similar to somebody not returning a glance in the street, or ignoring the remark of a stranger, is intrinsic to this strip of trading activity.

In the following sequence, toward the end of the trading day, a trader engages in a conversation while talking to his wife in front of the active trading screen:

Trader: We're playing a little mad over trades. [1"] It's like, whatever, dude. I might, I might nibble a little more, but [2"] I mean [.5"] obviously he sold these at a much cheaper price↓, but, you know, hahaha I might just say, well, give me those back↓, I'll sell you a few [1"] I didn't really want you to sell it to me at eightyfive, I count, I

think seventyfive is more appropriate, further out, but you've got to pay me more↑ than you would for the eightyfives, because, you know, it's ten dollars cheaper that you can sell it to me for. So you've got to give me more money for it. That's my attitude↑. hihhi you with me? [7"] This sure is a crazy market time↑. I guess today's everybody's, everybody decided today's not a good day to buy. Hehe

Immediately before this sequence, the wife has entered the room saying that the dogs are barking outside, which might mean that a code enforcement officer (a county inspector) is in the neighborhood. The trader uses the question to change the topic to his situation, and, having elicited interest, utters the above sequence. He had bought options on a company stock at a specific strike price and wants to sell options on the same stock at a different strike price. What is the appropriate price to ask for each strike price? Instead of using a general formula for calculating options prices, the trader relates to the anonymous "dude" he has bought earlier and tries thus to make sense of his own real intentions as a basis for identifying the right price for each strike price. At least in this instance, calculation does not appear as the mechanic application of a formula (which traders might even ignore), but as grounded in establishing a social relationship with a counterpart.

The first step is to create the encounter by bring the anonymous "dude" in, within a conversation embedded in the conversation with the trader's partner. Then, the "right" asking prices for two different strike prices (75 and 85) are made dependent on a change of mind ("I didn't really want") and on fairness imperatives ("you've got to give me more money for it"). Finally, this calculation is rationalized by the trader's defining his attitude with respect to outside, uncontrollable constraints ("crazy market time") and with the unwillingness of passersby to give him a glance ("nobody's willing to buy").

All this happens while the algorithm for calculating options prices, embedded in the trading software, is at hand; at the click of a screen button, prices can be obtained for any strike price and any underlying asset. Yet, there is a fundamental tension between using a trading screen assembled as a device for engaging in anonymous, brief encounters, on the one hand, and using a formula, on the other hand. Since the traders' activity is geared towards successful encounters, price calculation cannot but

unfold within this frame too, bracketing out algorithms (see also Lave, 1988, p. 122). The right price becomes then dependent on fairness issues, on the traders' changing their mind, on them not really meaning it—in short, on well known interaction and relational issues which can surface when encountering strangers.

The price emerges in a direct negotiation with the unseen trading partner, in a way similar to that in which participants in a gaming encounter of cards, sitting around the table, can ask each other to put more money on the table before they reveal their hands. This is not the price generated by a formula which is only a couple of clicks away, but by personal interaction. Trading means engaging with “guys,” “dudes,” and “buds,” not following on-screen instructions. As engagement with “guys,” trading relies on displaying socially relevant features. “Coolness” can be one of them, in the same way in which a game of poker can be at least as much about social rankings as it is about money.

### **Being in margin: calculation, encounters, and control**

When asked about their strategy, many traders can give elaborate accounts of the underlying philosophy, of the gurus who have influenced them (or not), or of long-term plans appearing as the pinnacle of rational behavior. Such accounts appear as socially approved vocabularies by means of which traders accept or mitigate responsibility for past actions (Scott & Lyman, 1968, p. 48). When observed in the actual process of trading, however, what traders do appears less as the result of well-thought, accurately applied plans (or formulas) and more as a struggle to cope with the constraints of the moment, to prevent the available financial resources from drifting away, to recoup past losses, or to try and prevent future possible losses (see also Suchman & Trigg, 1993, p. 173). Of course, lay traders can have sets of routines, which they apply according to the specific constraints of their trading accounts (e.g., standard v. retirement). Traders can also have specific notions at the start of each day, notions which they justify by reference to events they held to be significant. For instance, traders may want to do a straddle on a particular day, because they know that earnings are due on a specific stock. When active in their current account, traders may want to “play day trading” (buying and selling the same asset within one day), or they may decide against it; they may want to trade deriv-

atives on stocks, on indexes, or on currencies. Such notions, however, while justified post hoc by providing rational accounts about their benefits, about the “mind of the market”, and the like, can provide the starting point for, but do not determine what will actually happen in the trading encounter. As one trader put it, “ultimately you have to judge potential opportunities as they open up before you on the screen.”

Some constraints can occasionally come from personal circumstances: a large due payment may constrain the trader to risk more in his trades, in the hope of gaining more. The financial demands and constraints of household life, for instance, echo in trading goals. Professional trading can be affected by institutional benchmarks, the colleagues' performance, or that of “star traders.” Lay trading, in its turn, can be affected by personal and family plans and commitments.

A constraint looms every day in the background: keeping out of the margin. Getting into margin can trigger automatic liquidation of positions without any warning. When this happens, the composition and balance of a large chunk of the portfolio, if not of the whole will change. Sudden changes introduce an additional element of randomness, requiring sometimes substantial repairs. In order to avoid such situations, traders must, when margins are at risk, primarily act ad hoc in order to keep them safe: their actions are subsumed to this goal, and they will even accept temporary, present or future losses, in order to achieve it.

Getting into the margin is something which happens suddenly; it cannot be foreseen days or weeks in advance. A trade which looks advantageous, which perfectly hedges or complements previous trades can throw traders into margin. Their focal point is the manipulative zone of the trading screen. The portfolio, however, together with specific margins for each position, is displayed in a different window. Keeping it open all the time would obscure the trading screen. The required concentration on the manipulative zone of the trading screen, together with the obliteration of the actual portfolio situation from the traders' visual area will lead them to bracket out margin issues while trading. This, in turn, contributes to the suddenness with which a crisis can occur right at the start of the market:

Trader: .hh still in the margin though [gesture with the right hand to the face] .hh

Ethnographer: what's going up?

Trader: doubleju [.5''] it's [points with the finger to the cell on screen]

Ethnographer: oh, they've started. . .

Trader: [cursor on price cell on the screen; keeps cursor there; moves cursor one cell up] [15''] Christ, that doesn't mean it's not gonna turn around in .hh [opens new window, checks portfolio] [7''] ↑oh, I'm outta margin! Pshiii↓

Ethnographer: You're out of margin now?

Trader: yeah [opens portfolio window again, points with the finger] see, no yellow, it lights up when it's yellow [1'4''] [puts cursor on price cell] [6''] still some big losses

Ethnographer: [2''] lots of red there

Trader: yeah↓ [cursor is kept on same price cell] [28''] ↓damn! .Heh we'll see how long it lasts

At the opening of the trading day the trader banks his hopes on an open situation—prices are falling (and he has bet on a rise). Is a turnaround going to happen? The tension arises here between the trader's position (which he has defined as "not good" at the start of the day, and the situation (which will indeed change during the day). Benefiting from a change in the situation, however, depends on tending to the position and not slipping into margin. At the same time, nursing a weak position prevents the trader from taking advantage of changes on the screen. Keeping stable the definition of the situation (uncertain and hopeful at the same time) requires repairing the margin. A simple indicator is the yellow band which highlights the margins the trader has eaten into, so that the task will become that of keeping the yellow band out of sight, for instance by buying back some of the products the trader has earlier posted for sale. In this case, traders will deal with themselves. Such actions are coordinated with, and depend on repeated checks on the yellow band.

In more stressful situations, keeping margins intact can take one or more days; traders will work towards this goal until the storm has been weathered. Keeping the margin is not a simple operation which takes only a couple of seconds, but a process of continuous portfolio readjustment. For instance, if traders, in order to keep the margin, have bought

back some of the options they have posted earlier for sale, other positions will be affected.

Shielding the trading apparatus from external, uncontrollable disruptions is a key condition for engaging in encounters with other traders. At the same time, repairs cannot be conducted but by engaging in such encounters. Engaging in trading encounters with oneself can be done, if necessary, but it means lack of social relationships: it is like a temporary game of solitaire, and playing it for too long can be damaging. The task, therefore, is to search for encounters which will make the crisis signal—the yellow band—disappear from the screen. Looking for relevant encounters, however, has to take into account not only the trader's actual situation, but also future ones.

### Seeking out encounters

In order to safeguard margin, traders need to calculate how the price dynamics of the underlying asset is affecting the options they have sold. They will sometimes need to buy some options back, in order to stay within margin. If they have sold puts with an expiration date in the following month, buying them back now will affect the situation in a month from now. The task is to calculate the price of the underlying asset at which the puts will be wiped out—i.e., they will have to take a loss next month. The trades (put sales) are displayed in cells on the screen. The cells need to be correlated among them, but this correlation cannot be done without establishing first the link between a cell, or position, and what is in that position, a reflexive work (Scheffloff, 2006, p. 154) which cannot follow any pre-established plan. In a situation of fundamental instability, when cells flicker all the time without any apparent rhythm, this becomes even more important.

Any margin-maintenance intervention (in order to avoid forced liquidation of positions) will entail a corresponding adjustment of other related positions; this adjustment will affect the margin of other positions, which will require correction; this correction, in its turn, will trigger a readjustment of the portfolio, which may affect other margins, to the effect of further readjustments, etc. The trader's situation is one of flow (Knorr Cetina & Predal, 2007, p. 137), where the next sequence of action modifies projections of future situations, leading to other actions and other modifications, etc. All these readjustments will take place within an ever changing

setting: the screen flickers permanently. Calculating trades means correlating present situations to projections of future ones, and modifying these correlations with every step of action. Thus, the trader's task is that of tuning positions to a continuously changing display board (well knowing that these adjustments will introduce additional changes into this state), while trying to avoid random, uncontrolled shifts (such as given by a forced liquidation). Under these circumstances, calculating according to a pre-set plan is futile: no such plan can forecast how the next changes on the screen, triggered by the interventions of anonymous strangers, will affect the trader's positions and, with them, his margin. In such situations, open engagement with others is required. Like a person waiting for an encounter in the street, and who decides to become active in approaching strangers, traders may need to actively display their presence to anonymous others:

Trader: [after having checked portfolio page again] ↓That's easy, I'm still in margin [3"] I'm tired of this shit. [1'40"] [cursor moves across price cells for puts on the underlying asset, lingers on them: \$0.70, \$0.79, then moves over to \$1.54 and transforms it into \$1.55, then moves over to \$0.5 and changes the order limit from 1 to 4, then moves on "T," clicks, selling at \$0.5. Then opens portfolio page, checks. A yellow strip is there.] .ah shit, back in the margin suit .hh ↑ha hahaha ha [continues moving the cursor across price cells. Changes a price, clicks "T". Then opens the portfolio page.] [35"] fuhckhhh!

Ethnographer: the yellow.

Trader: yeah. All right, well, then I guess we gonna get some, get some bad ass↑ on this.// Ya know, it's called gittin the baadass↑.

Ethnographer: // .hh [19"]

Trader: [10"] ↑dadadadadaaadahdahaa tootoo tatatatataataa↓ [48"] Allright, so oh I'm getting down there. But we might just have to roll all these all down↓ [11"] Can't wait forever, noone waits forever [3"] [moves the cursor, changes the limit order to 20 for \$1.67, there is a buy cell on the right of the limit cell] twentee freaking sell twenty [then moves the cursor down to the sell order for the same price and positions the cursor on the limit cell, waits there. Does not click, but moves the cursor up, lingers with it in the \$1.65 cell, then moves it to the right and opens the

portfolio page. The yellow strip is still there.] Son of a ↓bitchhh! Ohkey, .hhhhh [16"]:hhoh-hohhohoho .hh tatata tatata tatatataataataa tatatatataataa [slaps hand on knee repeatedly] allright, we are not gonna wait too long [moves cursor upwards next to a buy cell, changes limit to 50 for a \$77 put, then prepares to move to the price cell]

Ethnographer: You're buying now?//

Trader: //I have to it's strrr th [4"] all right well [5"] actually, seventy or seventynine puts [moves cursor, scrolls page down, inserts new put at \$79. Clicks "Buy," sets limit at 10, sets price at \$2.59, moves cursor to "T", moves cursor back to price, changes it to \$2.60, moves cursor back to "T", clicks, checks portfolio page, moves upwards to "sell" at \$1.00, clicks "T", moves upwards to "sell" at \$0.56, clicks "T", checks portfolio, moves cursor down to "sell" at \$1.70, clicks "T", moves cursor upwards to sell at \$0.56, clicks "T" again, checks portfolio. Operations continue for 3'39".]

In the above situation, the trader decides to make his presence visible to others, to display himself without waiting for anonymous others to appear first. Such a display means posting trades to be seen by others: every trade displayed can affect other positions, and the trader's task is to balance various positions so as to make the yellow strip disappear while not (entirely) disrupting his future trades.

Making the yellow band disappear is not something which can be simply done by clicking a series of buttons on the screen, according to a set of pre-existing rules. It involves glosses which make bodily actions (such as placing the cursor on a specific cell) accountable. It is structured by hitches, rhythmic vocalizations, and response cries (like "son of a bitch"). It involves the trader repeatedly announcing his presence to others ("we are going to get bad ass;" "we are not gonna wait too long") as a means of defining the situation and of making potential, remote and anonymous partners present in his situation. Announcements of the own presence and acceptance of other presences as relevant ("all right well") are intrinsic to accomplishing the task at hand. The display to others is repeatedly announced by vocalizations, situational definitions, and self-summons (lines 14–16, 22–23).

Calculation is oriented here toward two interrelated tasks: making the yellow band disappear and finding relevant encounters quickly. The latter contributes to the former, but should not be exaggerated: once enough quick encounters have been found, this should stop. Therefore the step-by-step and recursive character of the calculative process: making a transaction, checking on the yellow strip, making another couple of trades, checking again. There is no overarching goal to this, only immediate, step- and sequence-relevant goals, analogous to what Edwin Hutchins calls evolutionary search (Hutchins, 1995, p. 349). If necessary, the trader transacts with himself—i.e., buys back the puts he has posted earlier for sale—becoming thus his immediately available other. Choices—buying at a strike price of seventy or seventy-nine, for \$2.59 or \$2.60—seem to be determined by available presences, as well as by the necessity of quick displays to potential anonymous partners.

The process-like, unplanned (and unplannable) character of this flow of reciprocal adjustments makes trading into something which is developed ad hoc, depending on and drawing upon the resources of the situation. The trader cannot directly and immediately recognize screen changes as expressions of an underlying plan (Hutchby, 2001, p. 138; Suchman, 1987, p. 33), to which he should adhere or react. The trader has an array of put options on the underlying asset (an industrial index) which he had previously sold and which he is forced to buy back now. The prices of puts, as well as the strike prices of the underlying asset vary. For instance, the trader can decide to buy puts priced at \$0.50, \$0.65, etc. on strike prices of the underlying asset of \$77, \$75, or \$79. He has plastered various combinations on the trading screen and needs to decide among them. Every trade, however, changes the situation, which needs to be continuously assessed and then modified again. Put simply, the task is to make the yellow strip—which indicates combinations of transactions gone awry—disappear from the portfolio window.

Adjustments are relational: they are conducted through brief, anonymous encounters, which require displaying oneself to others and reacting to the displays of others. Their unfolding does not follow pre-set steps; adjustments will have to be defined and justified in this very process. Definition implies here not only an answer to the question “what is going on?” but also anticipatory elements of the responses to the trader’s action (Smith,

1999, p. 135). A situational definition can require forms of talk drawing either upon the mundane presence of other actors, upon the trader’s own presence, or upon the potentially relevant presence of anonymous traders.

In this step by step process emerge interaction forms which, while firmly anchored in the situation, are not reduced to the physical presence of the trader, but combine it with absent presences—that is, with anonymous others who are brought into the situation. At the same time, traders can cross over to the other side of the screen, so to speak, when their presence has to be displayed more forcefully:

Trader: [16"] Okay↑, I guess that’s enough selling for one day [5"] .hh hahaha ha [16"] I guess I’m gonna go back and try again [13"] [drinks] so what’s my average [points finger to screen] it’s seventynine↑, not very good, [finger moves up and to the left on “buy”] fiftytwo, not very good [continues buying at different prices and limits] [30"] I said I’m in margin it’s not selling lately [22"] .hh [6"] ah donno pretty ugly, pretty down ugly [checks portfolio again. Yellow strip has reappeared.] yeah, here we go↑ here we go↑ [31"] [scrolls down the page, inserts buying puts at \$79, sets limit to 3, cursor on “T”, goes back, changes price to \$2.01] ohkey↑, let’s see if it’s found a floor now [14"] [checks portfolio, yellow band still there] ugly, mister, bitch ugly, ↓all I can say

The announcement about withdrawing from encounters (enough selling) is immediately followed by a second, contradictory one (try again), conditional upon locating averages, which in its turn leads to a definition of the situation (“pretty down ugly”) and then to an announcement of engaging in further encounters (“here we go”). This latter fails, and the trader addresses the presence of remote others as a means of justifying the failure (“ugly, all I can say”).

Finding the average means here the average price at which the trader has bought back the puts he had previously sold. While a simple arithmetical operation, it has to be done in real time—that is, while adjusting to the changing situation through continuously buying and selling. Here, the identification of the average price on screen (through pointing at the respective price slots) requires concomitant judgment: further actions depend on whether the average is seen as good or bad. This identification is achieved by bringing others into the situation: not



only that the ethnographer's display of availability is taken advantage of, but anonymous others are brought into the situation for making the failed action accountable. The trader, who has announced several times his intention to stop, continues trading (and fails in making the yellow strip disappear) because the situation is still "bitch ugly." Such insults and imprecations, while leaving the impression that the market is treated in an anthropomorphic fashion and endowed with a gender, serve in the first place situation-specific accountability purposes, and help orient the trader's actions. The use of talk during trading interactions (intrinsic to the tasks of defining what is going on, of calculating, and judging) includes mundane, vernacular expressions ("bitch," "baby," "bad ass") as consequential situational markers.

## Conclusion

The interaction order of anonymous online markets has at least the following features: (1) bodily work oriented towards the screen as a means of stabilizing and correlating data displays; (2) bringing anonymous strangers in the trader's situation; (3) self-displays to others. While previous ethnographic work has identified face-to-face (Abolafia, 1996; Zaloom, 2006) and face-to-screen (Knorr Cetina & Bruegger, 2002) as forms of the interaction order in floor-based and trading room-based transactions, respectively, a third form can be suggested here: that of presence-in-absence, characterized by brief, anonymous encounters within the trader's situation.

The screen presents itself as an observation and experimental instrument, but also as a tool for crossing over: an interface through which strangers can be "pulled" into the traders' situation, while these latter display themselves to strangers. The fundamental instability of this instrument, subjected to external constraints and continuous interventions, uncontrollable by a single trader, makes stabilization a crucial task. Stabilization requires a variety of situational resources, including the trader's own body, as well as vocal interventions in the trading process.

In anonymous online trading, calculations are not identical with pre-set plans. Neither are they identical with the application of a formula, the results of which determine trading decisions. While the institutional adoption of economic models (including formulas) has been recently debated under the banner of performativity (see, for

instance, MacKenzie, Muniesa, & Siu, 2007), the concrete uses of models and formulas do not follow automatically from their institutionalization.

Calculations are situational actions, geared toward brief anonymous encounters. Such encounters are realized by making absent strangers present into the traders' situations, as well as by the latter "crossing over" to display themselves to unknown others. While online traders employ routines, such as doing a straddle or trading index options, these routines do not represent strategic applications based on anticipations of the opponents' moves and on the evaluation of the latter according to criteria of efficacy. An analogy can make this point clear: basketball players can employ routines, such as passes or dribbles, but have ultimately to engage in encounters with other players on the field, encounters which will determine not only the character of a dribble and its outcome, but also the subsequent sequences of action. Doing a specific routine (a dribble or a straddle) appears less as a decision enacted in specific situations and more like the outcome of encounters in which participants engage with each other in socially relevant ways. On the trading screen, where strangers come close to each other, socially relevant attributes relate to acceptance, rejection, or resilience, among others.

Games of acceptance and rejection appear to be significant in online trading, but they are not unknown in institutional trading either. To give but one recent example: the huge losses incurred by the French bank Société Générale appear to have been caused by a trader's drive to become accepted in the circle of the "big guys" who earn big bonuses. Yet, returning to Geertz's notion of deep play, the kind of play taking place in online anonymous markets appear to be different from those of institutional trading: the latter seem to be about status competitions within relatively small groups, the members of which know each other. Here, indeed, the analogy with Geertz's cockfight arena could be pushed further, pointing at the need to examine in detail the interaction order of status competitions, together with the associated rituals (and consequences), within financial organizations.

Non-institutional online trading seems to be more about repeatedly occurring short bursts of social competitiveness among strangers. If, in Geertz's (1973, p. 449) interpretation, the cockfight was to be seen as a Balinese reading of the Balinese experience, online markets can be regarded as the

story a highly individualized, fragmented, competitive society tells itself.

Another relevant aspect is how price variations emerge in the interaction order of online trading. Such variations have been tied, among others, to ambiguous classifications done by analysts (Zucker-[man, 2004](#)) or, in the case of lay traders, to shared judgment errors due to a lack of sophistication (e.g., [Shleifer, 2000, p. 12](#)). This latter would imply unavoidably bad calculations on the part of non-institutional traders. The examination of the interaction order of trading, however, reveals that price variations are an intrinsic feature of trading encounters. Their anonymity and individual character include, if not outright require individualized price displays, a feature supported by the capabilities of the trading software. Since rejection and acceptance play a significant role, traders are encouraged to vary their prices as a means of encountering other traders. The sources of price volatility, then, should be sought less in imperfect calculations than in the very characteristics of this interaction order. This also points at competitive rituals as a possible source of price volatility within institutional trading. It is perhaps ironic that online financial markets, with an unprecedented degree of technological penetration and the explicit aim of attracting more and more laypeople into financial activities emerges as a platform for brief encounters, laying thus bare calculation as social competition.

### Acknowledgements

Research for this paper has been supported by a grant from the British Academy. I am very grateful to Karin Knorr Cetina, Donald MacKenzie, Donna Messner, Barbara Grimpe, Stefan Laube, Vanessa Dirksen, Cornelius Schubert, Ingo Schulz Schaeffer, and Bernt Schnettler for their comments. I am also indebted to the anonymous reviewers for their comments and suggestions, which have provided me with very valuable insights. My greatest debt goes towards the traders who have granted me access to the world of online financial trading.

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