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# Mood Implications on Social Behaviour in Complex Societies

## A Literature Review

by Linda Alengoz, Marco Castellani *and* Flaminio Squazzoni

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### 1. Introduction

In our everyday life, we are often prone to mood shifts. Not only do we sometimes “*get up on the wrong side of the bed,*” but we react emotionally for example to a newspaper reporting a dramatic political event. Similarly, a TV report showing stories of young unemployed people may influence our perceptions of the past and our attitudes towards the future. On the other hand, reading optimistic news about our country’s economy or knowing that Parliament has finally passed a law that protects the rights of some minorities we strongly supported, may increase our self-confidence and trigger compulsive behaviour such as lead us buying expensive unnecessary luxuries. Perhaps, under these influences, we make a decision we may have anyway come to – perhaps differently – before or possibly, we reinforce decision we were already tempted to make by predicting favourable futures, which now make sense. In any case, the exposure to real or perceived events can induce us to frame our decision within a collective dimension of meaning, which adds or reveals new insights to previous personal perceptions, whether intentionally or not [Stark 2009; Castellani 2013].

It is worth noting that our sensitivity to social mood and the importance of emotions have increased today. We are globally hyper-connected in real-time via social media that bombard us with news and communication by distant (often unrelated) people, who directly or indirectly influence our opinion even on important mat-

ters. The formation of online echo chambers and the growing polarization of public opinions pro or against vaccination or immigrants are often explained in terms of growing interconnectedness between emotive and cognitively biased individuals [Squazzoni 2013; Quattrociocchi, Caldarelli and Scala 2014].

Although the present is full of negative examples of mood effects on social behaviour, evolutionary studies suggest that emotions are part of our evolutionary equipment to face uncertainty and unpredictable environments [Cosmides and Tooby 2000; Cheng, Tracy and Henrich 2010; Sapolsky 2017]. Many personal experiences testify to this. If we meet an intimidating bear while walking in a wood, our survival chances do not depend on our capability of calculating the size of the bear or estimating the characteristics of the wood in detail. We follow fear-induced stimuli that make us flee as fast as possible. Studies on adaptive heuristics in a variety of contexts, from financial markets to prediction games, show that in many ordinary social and economic circumstances, cognitive shortcuts are more effective than any other computational technique [Borges *et al.* 1999; Gigerenzer and Goldstein 1999]. This implies that the complex co-evolution of environment and behaviour and the context-specific nature of actions' performance call for reconsideration of the computational, objective, standard meaning of "rationality", especially when individuals live in dynamic, uncertain and unpredictable environments [Stark 2009; Arkes, Gigerenzer and Hertwig 2016].

However, it is difficult to disentangle individual opinions from social mood. For instance, Lupia *et al.* [2000] suggested that "public mood" is an attribute of individuals, not a "public" property, as it varies across individuals and over time for the same individual. They suggested that:

Public mood is an [...] affective state, having distinct positive and negative components, that citizens experience because of their membership in a particular political community [p. 131].

They claim that:

[One] can instigate emotional responses. Thus, public mood is a type of "social emotion", a concept developed by the psychologist Eliot Smith to distinguish feelings that arise because of group attachment, rather than more individually based experiences [p. 132].

Casti [2010, 24] suggested that mood is a feeling or a belief of a group, community, population or society about the future. Besides many possible definitions, we suggest here that social mood is a set of *socially constructed perceptions by individuals on certain salient features of the social context in which they live, which are built not on computation calculi on available objective information but on constructive processes*

*of collective meaning*. These perceptions typically connect individual past experience and anticipated future scenarios adding a collective dimension that establishes their “meaningfulness” as representations of the reality [Cowley 2007; Kelly 1955]. They can be (non)intentionally/(un)systematically formulated and might have positive or negative implications on behaviour (e.g., inducing trust and security or fear and insecurity).

While common sense is full of expressions that reflect collective anxiety, effervescence or social cycles of pessimism or optimism, the challenge for any sociological inquiry is to pass from a broad picture or a collective abstraction to the understanding of macro-micro mechanisms that specifically lead mood effects on individual decisions. This requires us first to disentangle the complex link between social mood and individual emotions, and secondly, to reconsider the traditional concepts of “rationality” and “decision making”, which are dominant in economics, game theory and among some scholars in organisational and management studies.

Social and cognitive psychology studies suggest that mood embodies less specific information and meaning than emotions, but connects unrelated domains of meaning faster than the latter. Indeed, moods are defined as “intrinsically objectless phenomenal experiences,” while emotions are sensitive states rooted in the cognitive system of an individual [Oatley and Johnson-laird 1987]. Emotions had an intentional inherent aptitude as they are typically directed towards an object, e.g., the bear in the wood, whereas moods are more general and denoted by core affect.

As suggested by Siemer [2009]:

Because, as a consequence, the person’s mood experience is directed at *multiple objects*, the person has the subjective impression that no clear object exists. For example, if the angry passenger in the above example were asked to state what he is angry about, he might answer: “about everything” or “about nothing specific [257-258].

This explains why moods have polarized, dichotomous “values” (e.g., bad/good), which are characterized by dispositional attitudes, whereas emotions may result in several non-linear, mostly subtitled and nuanced behaviour. Such a multiplicity can also explain the interchangeability of moods, emotions and affects characterizing early research on mood in social cognition. However, the so-called “Dispositional Theory of Moods” suggested that moods are temporary dispositions that produce emotion-related, specific appraisals, which in turn are key for subjects to experience mood itself [Ellsworth and Scherer 2003]. This means that mood would make individuals more prone to feel different situations coherently with it, so that it may

also have a performative, self-fulfilling function on perceptions [e.g., Esposito 2011; 2013].

According to Siemer [2009]:

[...] Experiential difference between mood-experiences and emotions is gradual or quantitative, rather than abrupt or qualitative. That is, each concrete emotional or mood experience can be located at some point of an emotion–mood continuum, whose endpoints are anchored by, respectively, prototypical emotions (affective experiences directed at a single, concrete object), and prototypical mood-experiences (affective experiences that have no specific object) [258].

This means that the mood has a “self-regulatory” function, i.e., it entails a process through which people continuously test their state of being by reflecting on information emerging from everyday interactions. Not only do mood-experiences and prototypical emotions influence a person’s behaviour, whether in mood-congruent or not forms and in counter-adaptive ways compared with what emotions would predict [Rottenberg 2005]<sup>1</sup>. As found in experimental research on organisations, mood is also socially contagious: at the same time, it enhances and triggers social emotions. For instance, in a leadership role-playing experiment, Bono and Ilies [2006] found that positive emotions (even simple facial expressions or expressive charisma) could act as drivers of mood contagion amongst followers. This shows that prototypical mood-experiences, although not directed to a specific object, could influence the way individuals perceive the “value” of certain stimuli, even mediated by interpersonal relationships and so giving rise to sense-making processes that have a constitutive social dimension.

The rest of the article is organised as follows. The next section presents the history of the idea of social mood including classical sociological studies on collective behaviour and public mood, while the second part reviews socio-economic theories of economic action connected to the mood. The third section looks at recent empirical studies on social mood and its implications on social, economic, and political behaviour. This also includes a short discussion on the problems of quantitative measurement, given the impressive amount of data we now have on collective opinions on social media. The closing section draws some general implications from the study. It suggests disentangling social mood from emotions and discusses the need for a more sophisticated notion of social rationality. Our findings suggest that integrating (big, behavioural, population) data and (psycho-sociological) theory is key to understand why social mood is increasingly influencing social relationships,

<sup>1</sup> E.g., see cases where the mood-facilitation hypothesis was violated in Rosenberg [1998].

economic exchanges and political preferences in complex, globally hyperlinked societies.

## 2. Mood and Emotions in the Literature

### 2.1. *Classical Sociological Studies on Collective Behaviour and Public Opinions*

While predicting social outcomes is important and now probably ideally even possible through big data mining on the web, this does not mean that we can explain the social mechanisms through which these complex social outcomes emerge. As a result, by starting with some classical sociologists, we aim to develop more precise definitions of this concept.

The roots of studies on social mood and its impact on individual behaviour can be traced back to the sociologist Émile Durkheim. He was interested in collective conscience and beliefs in terms of fundamental societal features that allow people to develop coherent and meaningful formations that allow integration into society. By collective conscience, Durkheim meant the “totality of beliefs and sentiments common to average citizens of the same society” that “forms a determinate system which has its own life” [Edles and Appelrouth 2009, 106]. In his famous book *Suicide* [Durkheim 1951], he focused on the main factors that could induce people to commit suicide. He characterized four types of suicide and described the reasons of such an extreme behaviour.

The first type is *egoistic suicide*, which occurs when the degree of social integration is low. In this situation, people do not feel they are supported by a social group. Very often, they feel isolated and helpless and eventually do not see the true meaning of life. Unlike this first type, *altruistic suicide* occurs when the degree of social integration is very high. Great involvement within a social group leads individuals to neglect their own needs and goals and to consider only collective norms and values. *Anomic suicide* is associated with low degrees of social regulation that usually occur during times of great social transformation or stress. The absence of social norms and regulation, *anomie*, frustrates people in that they cannot handle stress during drastic changes in their social condition [Garfield 1987]. This type of the suicide could reflect the pessimistic mood that rises as a reaction to market crashes and economic depression.

This phenomenon of social disorganisation has been attributed specifically to the commercial and industrial world, where this type of suicide occurs more often. In this respect, recent data have confirmed this hypothesis and showed that economic turbulence tends to increase suicides. For example, during the recent economic cri-

sis, which hit Greece particularly hard, the mean suicide rate rose by 35% between 2010 and 2012, from 3.37 to 4.56/100.000 population [Rachiotis *et al.* 2015, 2]. As expected, suicide mortality increased for both sexes in the age groups 20-59 years, especially affecting the economically active population. Data showed a significant association between male unemployment rates and suicide mortality among working age men, aged 15-64. Reeves, McKee, and Stuckler focused on the effect of the Great Recession (2007-2008) on suicide in the United States, Canada and European Union countries. They found that at least 10,000 suicides occurring in the States, Canada and the European Union over the period 2007-2010 were influenced by the recession. The suicide rate in the USA increased by 4.8% after the start of the recession, with 4,750 suicides that could be attributable to the recession. While suicide rates increased for both genders, the increase for men was four times greater than that for women [Reeves, McKee, and Stuckler 2014].

Nevertheless, Durkheim also argued that even in times of economic upturn and prosperity, during which the wealth of the country is rising rapidly, these changes have the same effect on the number of suicides as economic downturn. Whenever a society undergoes either changes brought by the sudden social transformation or a rise in economic growth or unexpected failure, people take their own life more frequently [Durkheim 1951].

The last type of suicide is *fatalistic suicide*, which occurs when people are under strict control and regulation by authority. The extreme rules and very high expectations make individuals lose the sense of themselves. According to Durkheim, anomie is a specific factor of suicides in society. Furthermore, he suggested that each type of suicide depends on the nature of the relationship between society and its members, not on the way this relationship is regulated.

Another classical sociologist, Robert K. Merton defined anomie as a normative breakdown. This indicates a “gap between people’s aspirations and their access to legitimate means of achieving them results in a breakdown of values, at both societal and individual levels” [Garfield 1987, 273]. According to Merton, both failure and success can provoke deviant behaviour. Merton argued that anomie of success is rare. However, there are plenty of examples of people responding to the socially approved achievement of a highly prized goal with deviant behaviour [*Ibidem*]. This is the case with business people, who get engrossed in despair after recently successful financial deals, or alternatively with writers, who commit suicide shortly after their novels win critical acclaim. The same happens to scientists, who suffer nervous breakdowns following important discoveries [*Ibidem*, 279].

Why should those who successfully obtain their goals react as if they were failing? Merton believed that the success of these people involved “the personal discov-

ery that the attainment of a long sought-after goal is not a stable stopping point. What appeared as the end of the road becomes, in the actual experience, only another way-station" [*Ibidem*, 279], a false summit. Social pressure prevents those who get to the top of the tower to become satisfied. People expect more and more from themselves and this creates a stressful situation.

To look at the implications of social mood, we can go back to other classical studies on collective behaviour. The first theory of the "crowd mind" was proposed by G. Le Bon [Le Bon, 1895]. He argued that in the period of social decline and disintegration of society, crowd power tends to increase. The psychology of an individual, as part of a crowd, is subordinate to the "collective mind", which radically transforms individual behaviour by diminishing or eliminating rational control over behaviour [McPhail 1989]. Gradually, crowd behaviour became of less interest to sociological literature, while modern sociology focused more on looking at social mood as part of collective behaviour.

The most influential general theory of collective behaviour in sociology was formulated by Smelser [2011]. He emphasized the importance of "generalized opinion" or "generalized belief" as they might shape social movement in periods of rapid social change and political disintegration. He developed a model that explains the nature of collective behaviour in terms of the structural conduciveness and structural stress (e.g., economic constraints). The diffusion of generalized belief is an initiating factor of the effectiveness or ineffectiveness of social control.

In this respect, it is also worth mentioning the "contagion theory of collective behaviour", which is connected to study social mood waves and their impact on individual behaviour. This theory is based upon the idea that moods and thoughts become contagious within certain types of crowds [Locher 2002]. Robert E. Park was among the first sociologists to investigate crowd behaviour. Park added some important elements to the analysis of collective behaviour of Le Bon who, according to Park, had weak theoretical foundations. Park added the concepts of social unrest and circular reaction to contagion theory. Social unrest is transmitted by a circular reaction process. This includes interactive communication between individuals that could trigger discontent via information cascades that tend to self-reinforce [Park and Burgess 1921].

In the same vein, Herbert G. Blumer, a symbolic interactionism scholar in sociology, argued that the nature of collective behaviour involves systematically looking at crowd gatherings, panic, mania, dance crazes, spontaneous mass movements, mass behaviour, public opinion, propaganda, fashion, hobbies, social movements, revolutions and reforms [Blumer 1969a]. After analysing the elementary forms of collective behaviour, Blumer revealed important social mechanisms, such as jam, col-



lective excitation and social infection as relatively rapid, unconscious and irrational distribution of any mood, impulse or behaviour, by citing the examples of military hysteria and the spread of market panic. He identified and described in great detail collective behaviour, through four types of elementary collective groups: the acting crowd, expressive crowd, mass and public. According to Blumer, the basis of collective human behaviour lies on common values, expectations and understandings generated by some significant symbols shared by a group of individuals. When there is a destruction of significant symbols, spontaneous interaction may occur – overflowing passion during mass-meetings, incremental panic of currency exchange, emotions of sport supporters and so on. Spontaneous collective behaviour usually emerges when established values, habits and significant symbols, which previously regulated social activities, are violated. In this case, there is some form of social interaction, called “circular reaction”. Excitation or agitation of a single individual is transferred to another, passed round, and these waves of excitation tend to intensify and lead to social unrest. This can be limited to a small group of people, e.g., labour disputes, or involve larger spheres of society, e.g., political protest.

Blumer defined the main features of collective excitement as follows: 1) people feel a strong impulse to action but do not have clear goals, which leads to erratic behaviour; 2) fears, increased aggressiveness, rumours and exaggerations emerge; 3) there is irritability and heightened suggestibility of people and as a result, their behaviour is deprived of normal consistency and stability, which in turn contributes to the response to a variety of new symbols and values, incentives and ideas [Blumer 1969b]. Therefore, social excitement can be a symptom of the decay of established values and the collapse of the current way of life, but also a signal of people’s ability to percept new symbols and meanings.

When collective excitement is very intensive and widespread, what Blumer called “social infection” is likely to appear. Social infection refers to the relatively rapid, unconscious and irrational distribution of any sentiment, impulse or behaviour, e.g., insanity, obsessions and hobbies. In its extreme forms, it works like social epidemics, such as in the case of tulip fever in the Netherlands in the Seventeenth century or dance mania in the Middle Ages. In modern times, we can see it in the evolution of war hysteria or stock market panic.

Social infection can be considered as a form of intense crowding and collective excitement. This is characterised by insane responsiveness of individuals in relation to each other. The most interesting and exciting feature of social infection is that it attracts and infects those individuals who were initially detached from what is happening and were merely indifferent spectators or observers.

Initially, people may simply be curious about this type of behaviour or be only marginally interested in it. However, as soon as the common focus is on the same object, person or event and the spirit of excitement creeps over a crowd, people become more sensitive to the behaviour and so more inclined to get involved in it as they begin to influence each other [Locher 2002]. This can be seen as a kind of reduction of social resistance caused by individuals undergoing a certain loss of identity and therefore losing the ability to interpret the action of others. As a result, people under collective excitement become more and more obsessed with this type of behaviour and so they are more easily affected by new incentives or motives. Where people already have a predisposition to act in a particular way, for example, striving for profit, escaping from danger or expressing hatred, the appearance of collective excitations easily releases their motives. In such circumstances, this type of behaviour will spread like wildfire, as one can see in rampant stock market speculation (a speculative orgy), a financial panic or a wave of patriotic hysteria [*Ibidem*].

## 2.2. *The Nature of the Social Mood*

Common sense suggests that mood is what an individual or a group feels about the future. Therefore by analogy, it can be seen as a feeling or a belief of a group, community, population or society about the future [Casti 2010, 24]. As previously outlined, being directed to multiple objectives tends to polarize mood around extremes, for example positive and negative. If in any given period, a social group has a positive mood, individuals will look at the future optimistically, ideally even beyond any rational motivation. The opposite is true if the group is under negative social mood.

Although reality is full of many “greys”, as mood is an emotional social construct and emotions are typically extreme conditions, it is likely that simplifying into “black” or “white” can help us analyse mood implications without losing too many details of the sense of reality. For instance, if we look at history, periods of positive social mood are often associated with rising stock prices, re-election of incumbents, peace and even the popularity of brighter colours and shorter skirts [Casti 2010]. The opposite is true, as periods of negative social mood tend to be correlated with falling stock prices, rejection of incumbents, increasing regulation and the popularity of darker colours or even longer skirts.

The concept of social mood as a “collectively shared state of mind” [Fang and Nofsinger 2009; Olson 2006] is attributed to Robert Prechter, who developed the so-called “socionomics theory”, to explain the causality of social action. This theory of

social behaviour aims to unify a structural model of aggregate behaviour with a model of individual agent participation, whose key element is the law of patterned herding [Prechter and Parker 2007]. According to this law, decision makers are uncertain about other agents' valuations, while these are necessary for their survival and success. This implies that individuals' opinions tend to reflect endogenously regulated aggregations of unconscious herding impulses. These form a pattern of social mood as a motivational force of social actions [*Ibidem*, 10]. For example, agents evaluate differently items as a "good" and those to be viewed as an investment according to the item's value over time. Thus, when people are certain about their own evaluations, they will usually choose an option that fully reflects their own judgement, as they are confident about what they know. On the contrary, when people are estimating a choice as a potential investment, uncertainty will dominate, as they cannot fully predict the value others assign the same future investment. This implies that decision makers' appraisal will use others' decisions to reduce their own uncertainty and so become prone to a herding impulse [*Ibidem*, 11].

It is important to note that even individually, most investors, despite years of exposure to financial markets, do the opposite of what they should and do so repeatedly [*Ibidem*, 13]. In this case, the best way for investors to change their behaviour is to become aware of their herding impulses and prevent them.

Changes of social mood can be fruitfully described by the "wave principle" [Prechter 2003, 8]. Elliott found five-wave (impulsive waves) up movements in the direction of the main trend, followed by another down pattern of three corrective waves, thirteen distinct wave degrees, the largest of which is the "Grand Super-cycle", waves that lasted for years, and the smallest "Sub-minuette cycle", consisting of waves that might last just a few minutes or less.

The essence of the Wave Principle is that moves in the direction of the trend of the wave of next higher degree are five-wave patterns, while moves against the trend of the next larger degree are three-wave moves [Casti 2010, 212].

It is possible to predict the future direction of prices using this information. However, Prechter argued that the Wave Principle does not provide certainty about market outcomes, rather it supplies an "objective means of assessing the relative *probabilities* of possible future paths for the market" [Frost and Prechter 2005, 3].

Prechter also showed that fluctuations in social mood (the unconscious and irrational waves of optimism and pessimism) are due to the human mind and social interactions, with common examples in finance, macroeconomics, politics, fashion and entertainment [Prechter, 1999]. Social mood waves are endogenously regulated, fluctuating towards "positive" (optimistic) and then "negative" (pessimistic) directions

according to a patterned, hierarchical fractal called the “Wave Principle”, identified as a stock market model by Ralph Nelson Elliott in the 1930s. Waves might have substantially different quantitative forms but mainly revolve around five specific forms and a limited number of variations thereof. Given that Elliott waves are patterned, they are probabilistically predictable, thereby making the character of social trends probabilistically predictable as well. Thus, Prechter argued that it is social moods that create the character of social action contrary to popular beliefs [for example, Lupia *et al.* 2000; Casti 2010], which states that social events determine social mood.

The socionomic theory postulated that social mood regulates other variables including the economy as a cause rather than a result. According to Prechter *et al.* [2012], stock market movement is a far better predictor of GDP than GDP is of the stock market. An increasingly positive social mood produces a rising stock market and an increasingly negative social mood produces a falling stock market. Prechter identified four types of investors’ emotions during four stages of a stock market cycle: 1) market uptrend: calm, contented, at ease; 2) market top (peak positive mood): energetic, happy, enthusiastic; 3) market downtrend: sad, fatigued, inhibited, insecure; 4) market bottom (peak negative mood): tense, hostile, angry, antagonistic [Olson 2006]. Nofsinger simplified this even further by distinguishing two social mood extremes characterised by optimistic or pessimistic business aggregate investment activity. He defined the stock market mood itself as being due to the efficient and emotional nature of stock transactions as a direct measure of social mood. He argued that since the tone and character of business activity followed rather than lead social mood, stock market trends help to forecast future financial and economic activity [Nofsinger 2005].

Major historical events such as law-making, wars and various economic and political activities are the result and indicators of public mood changes. Time is needed to induce “an extensive swing in mood throughout the populace for the shared mood change to result in such events” [Prechter 2003, 4]. We can find certain examples of this throughout history, when the extreme points of mass mood permitted actions that imposed a political rigidity on the society. For instance, the pessimistic social mood in Germany in 1933 was reflected in the political life of the country – Adolf Hitler came to power. Another example is the collective mood in the United States during the Great Depression.

### 2.3. *Distinguishing Mood, Emotion and Affect*

Previous studies have suggested that the definition of mood could conflate with that of emotion and affect. In order to avoid this, the so-called “Dispositional Theory of Moods” defined moods as temporary dispositions to produce emotions-related appraisals. This emphasizes a time dimension in that while emotions usually tend to last for a short time and fluctuate quickly, moods persist over longer periods, even across situations [Ekman 1994; Diener and Lucas 2000; Atwater 2012].

For instance, previous studies on individual microeconomic decisions and aggregate trends in financial markets found that emotions play a crucial role in determining complex aggregate dynamics, that is they can be easily shaped by specific (also largely irrelevant) events. For instance, Lerner, Small and Loewenstein [2004] showed that emotions could considerably effect business transactions, even when they arose from irrelevant situations. Consider the endowment effect, i.e., the tendency of an individual to attribute a higher value to an item that someone already owns so that one is willing to pay to purchase it. This effect has been similarly defined as “the tendency for selling prices to exceed buying or ‘choice’ prices for the same object” [*Ibidem*, 337]. Their findings showed that certain emotions, e.g., disgust and sadness, influence both buying decisions and sellers’ prices. A recent study by Shiv *et al.* [2005] confirmed the importance of emotions for decision making involving risk. They found that patients with chronic and stable focal lesions in specific components of a neural circuitry, critical for processing emotions, were capable of maximising profit better than control subjects [*Ibidem*, 436]. Brain-damaged patients responded less emotionally compared to other subjects’ behaviour and therefore invested more logically. They noted that decisions under uncertainty are linked to different neural processes so that, depending on the circumstances, emotions can have positive or disruptive implications on decision-making [*Ibidem*, 438]. This is because confidence and certainty about the future are highly correlated.

However, unlike emotions, mood can shape events [Olson 2006; Atwater 2012; Casarin and Squazzoni 2013], induce connection of meaning between previously unrelated issues and involve a variety of circumstances. Indeed, emotions are usually associated with someone or something, e.g., love for a spouse or fear of a bear in the wood. They always have a cognitive content or an “intentional” object [Dennett 1989; Searle 1983]. This is not true for mood, which is typically free-floating and detached by any intentional, concrete object. Indeed, mood may be experienced without any particular stimulus and directed towards no specific target [Wood, Saltzberg and Goldsamt 1990]. This means that social mood can reflect the specific affective

condition of a population exactly because it is not necessarily tied to any specific event or circumstance.

It is not surprising that social mood has been intensively studied in empirical finance. Given the reflexive nature of financial markets [Esposito 2011 and 2013; Squazzoni 2013; Casnici *et al.* 2015], aggregate trends can reflect overall public mood. Indeed, research suggests that the stock market might be the “true” index of social mood, i.e., the collective level of optimism or pessimism in a society at any given time [Frost and Prechter 2005; Prechter 1985 and 1999]. Nofsinger showed that social mood determines decisions made by consumers, investors and corporate managers and that the level and nature of business activity follows rather than leads social mood. Social mood is considered an endogenous construct inherent in human psychology that can override external influences on economic outcomes [Nofsinger 2005].

Rational decisions can also be influenced by the asymmetry in perception of positive and negative information. Experimental studies have shown that individuals pay more attention to information that they consider unique, novel or extreme. This difference can be explained by cognitive weighting: given that individuals are loss adverse, they fail to cut back on expenditure immediately following a negative news regarding an expected economic decline. The opposite is true, given people are not gain adverse and tend to increase their consumption when confronted to optimistic news [Soroka 2006]. Moreover, mass media, as a source of information about the state of the world, may already asymmetrically biased. For instance, as shown by Casarin and Squazzoni [2013], the amount of space in a newspaper for negative economic news is always greater than that for positive economic news, which are less newsworthy. Thus, positive economic information does not generate positive articles to the same extent as negative information produces negative articles. For instance, positive shifts in unemployment are less newsworthy than decreases. The same has been found in the case of news on financial markets [Casarin and Squazzoni 2013].

### **3. Empirical Studies on Social Mood**

There is a variety of sociological and psychological research papers examining social mood and how it affects individual choice and economic activity. Ever more research in this field testifies to growing interest on this issue. We can classify these studies into different thematic blocks. Classical studies on the influence of mood on social interactions, including helping tasks and weather conditions. The second block includes behavioural (experimental) studies on the role of mood for individual

assessment and judgement during everyday tasks. These studies have mainly looked at the asymmetric impact of negative information on economic behaviour. Finally, there are recent studies on social mood implications on elections, the stock market and mass media, including the impact of certain behavioural aspects such as the perception of organisational risk, gathering of business information, willingness to take risk and even engagement in romantic relationships.

Since the 1970s, research has considered the impact of mood on social behaviour. For instance, Isen and Simmonds [1978] tested various helping tasks to estimate a previously observed relationship between feeling good and helping. 109 subjects were observed for eleven months, finding that individuals are more prone to help others when they are in a good mood. Results showed that helping depends on good mood and this facilitates social relationships and cooperation. Subsequently, Cunningham [1979] performed a similar experimental study on the relationship between weather and helping behaviour. During the first stage of the experiment, 540 adults were exposed to an experimental treatment, some subjects were asked to participate in a survey during sunny weather conditions, while others participated during inclement weather. The amount of sunshine was a strong predictor of a subject's willingness to respond to an interviewer. Furthermore, weak correlations were also found between helping and physical parameters such as temperature, wind velocity, humidity and even the lunar phase. The second part of the experiment was conducted indoors and involved 130 dining parties to control for comfort factors. Sunshine, lunar phase, age and sex of participants were all good predictors of the generosity of tipping.

By further elaborating on these findings, Carlson, Charlin and Miller [1988] examined the hypothesis that positive mood and willingness to help were strongly correlated. They focused on the following variables: attention, objective self-awareness, separate process, social outlook, mood maintenance and the concomitance hypotheses. They initially measured sixteen variables that referred to: *a)* subject and design characteristics; *b)* features associated with the positive affect induction; and *c)* helping opportunity. Their results suggested that the subjects' age, helping task pleasantness, social outlook, and self-awareness were all positively associated with helping behaviour. On the other hand, guilt, high/low positive affect and sustained helpfulness were negatively associated with helping task. An increase of the relative amount of helpfulness was found among participants who had a positive mood.

Several experimental studies have shown that human social relationships are positively affected by the weather and facilitation of positive social relationships. For instance, Guéguen [2013] studied the impact of weather conditions and hypothesized that other types of behaviour, such as a courtship solicitation, can reflect weather ef-

fects. He conducted a field experiment, in which women walking alone in a shopping mall were approached by an attractive 20-year-old male confederate, who solicited them for their phone numbers. The experiment included 500 women between 18 and 25 years of age chosen randomly and was conducted on sunny and cloudy days. Results showed that the weather and the age of the participants were significantly correlated with courtship requests, while temperature and the confederate's attractiveness score were not significant. In short, young women were more likely to give their phone number to a young man when they were solicited during sunny days rather than any intrinsic attraction value. The pleasant environment induced by pleasant music, odours and sunny weather surrounding women, also probably stimulated a positive mood, which in turn affected receptivity to the courtship solicitation.

Developing this argument further, Guéguen and Jacob [2014] found similar results by testing the effect of weather conditions on survey compliance. They found that participants approached by an interviewer and asked to participate in a survey were less averse to completing the form during sunnier days compared to cloudier days. The hypothesis was that participants solicited during sunnier days were more inclined to comply with the request. The sample included 616 men and 768 women in the age group between 25 and 50. A log-linear analysis of these variables confirmed that a greater number of participants complied with the survey requests during sunny days and that there were no gender differences.

Along the same lines, Flynn and Greenberg [2012] found a correlation between daily tipping rates and future weather conditions by examining more than two years of transaction-level data from a moderately priced restaurant in New York, the United States. Data were collected from 11,766 credit-card transaction receipts from 1999 to 2001. Their focus was on the relationship between tipping as a dependent variable and sunshine as an independent variable. Contrary to the previous studies, they found no statistically significant relationship between average daily tipping rates and future weather conditions.

Kopelman studied the influence of individual mood on the distribution of a desired or undesired good in an individual's possession [Kopelman 1998]. She examined individual emotional states and their effect on social value orientation. For social value orientation, she referred to individual preferences for particular outcome distributions in situations of social interdependence. Results confirmed that negative mood increased the probability of individualistic and competitive choices, while positive mood induced prosocial behaviour.

Many behavioural studies have found that individuals are often irrational victims of inconsistent judgments or intentionally do not consider their economic utility in order to satisfy their subjective psychological comfort while following satisficing



rather than optimizing solutions [for example, Simon 1957]. Probably, our mood easily influences our assessment of tasks we are requested to accomplish in our everyday life. For instance, Forgas, Bower, and Krantz [1984] investigated the effect of individual mood on personal judgment as well as formal/informal, intimate/non-intimate communication on individual assessment and social behaviour. Results showed that there was a strong mood influence on behaviour assessments and recall memory and significant effects due to target (self vs. other) and the type of interaction episode. This would confirm previous studies where individuals tended to remember more about difficult and stressful episodes, when they are involved in formal or intimate relationship. When in a good mood, they remembered more readily about easy, happy episodes, especially when they were involved in informal, non-intimate relationship.

In a subsequent study, Forgas evaluated the role of mood on typical and atypical targets [Forgas 1995]. He argued that our judgments on unusual, atypical couples tend to reflect our mood. Experimental results showed that there is a greater mood-consistent bias in memories and judgments on atypical rather than typical relationships. In the first experimental settings, subjects viewed happy and sad videos, which aimed to induce a good or bad mood. They were asked to judge couples who were well-matched or ill-matched in terms of physical attractiveness. In the second experiment, a false-feedback mood induction was given to the participants, which was followed by a request to judge typical and atypical couples. In both cases, mood had a significant effect on the evaluation of the relationship. Subjects who were more induced towards a good mood made more positive judgments than the control group, while those who were induced towards a bad mood were more negative in their assessments compared to the control group. In both cases, mood effects on judgments were consistently greater for mismatched couples.

Research also showed that individuals are influenced by social mood to reduce asymmetry of information and unpredictability of future scenarios by exploiting direct or indirect social information [Casti 2010]. This has also been acknowledged in political sciences [Soroka 2006; Prechter *et al.* 2012]. Soroka [2006] studied the dynamics of public responses to economic trends by means of content analysis of newspapers. Media content was measured using unemployment and inflation indicators in *The Times* (London) from July 1986 to December 2000, and more than 5,000 relevant were analysed. Results showed that public responses to negative economic information were much greater than those to positive economic news. The same trend was found in mass media content in information content that enhanced asymmetric public responsiveness. Other studies have documented the effect of the press and the media, including real-time, globally connected social communication platforms on collective perceptions. For instance, many studies have recently shown that the financial press

and the media can have a strong effect on financial markets, causing abnormal profits and price volatility of certain stocks [Beber and Brandt 2010; Tetlock 2007]. Data and financial analytics published in any reputable newspaper, as well as rumours about certain companies, can push investors to revise their expectations and forecasts and change their investment. On the other hand, we have little knowledge concerning the impact of news on markets that might generalize social optimism or pessimism, as well as subjective opinions of financial journalists, especially in times of economic turmoil.

This effect can also be looked at when considering important events that reflect people's opinions and preferences, i.e., political elections. For instance, Prechter *et al.* [2012] analysed all American presidential election bids by measuring relationship between the net change in the stock market and the number of percentage points separating the incumbent from his nearest challenger in the popular vote. Furthermore, the percentages of total popular vote, percentages of total electoral vote, electoral vote margin percentages, and overall wins and losses of elections were included as additional measures of incumbent performance. The analysis included all presidential elections in which an incumbent candidate ran, starting from 1824. Results indicated a large and statistically significant correlation between votes and a net gain in the stock market during the three years before the election. The net gain was a strong predictor of more votes cast for the incumbent, while the opposite was also true, i.e., a net decline over three years was strongly predictive of fewer votes cast for the incumbent relative to the nearest challenger. They found that mood is a stronger regulator of re-election outcomes than economic variables such as GDP, inflation and unemployment.

According to Parker the waves of social mood can change the political preferences of voters [Parker 2006]. In a downtrend, voters are willing to change from a candidate, while the opposite is true when the optimistic social mood prevails; voters are willing to keep a candidate and their party in power. Prechter *et al.* [2012] found that voters unconsciously credit or blame their leaders for their mood.

A rational set of ideas about policies may predict what voters may say, but measures of social mood better predict what voters will do, as they unconsciously act upon their moods along with the rest of the herd [Parker 2006, 3].

It is probable that social mood emerges through “thought contagion”, i.e., whereby elementary ideas or snippets of cultural artefacts like popular songs or jingles can be transmitted from one brain to another via a mechanism not unlike the transmission of a flu virus [Casti 2010, 28].

Individuals are consistently trying to “infect” the brains of others with their ideas and beliefs by means of interaction, hence forming social mood even though

they are not in direct contact. This would confirm certain psychological experiments on emotional contagion. Hatfield and her colleagues suggested that people tend, from moment-to-moment, to “catch” others’ emotions [Hatfield, Cacioppo and Rapson 1993].

This process of emotional contagion consists of three stages: Mimicry, Feedback, and Contagion. First, people tend to automatically mimic and synchronize their own facial and vocal expressions, postures with the ones of other people around them and consequently they might feel a slight reflection of their companions’ actual emotions. Finally, people tend to catch one another’s emotions [Hatfield, Rapson, and Le 2011]. Therefore, people can “feel themselves into” the emotional state of others. In their previous study, they found that others’ opinions heavily influenced individuals’ conscious assessments of what others “must be” feeling. In the series of experiments, people who had their own emotions, however, were more influenced by the non-verbal clues of others as to what they were really feeling. Hatfield, Cacioppo and Rapson [1993] stated that individuals seem to be capable of mimicking others’ facial, vocal and postural expressions very rapidly. This means that they are able to feel themselves into the place (emotional empathy) of those whose emotional state they have absorbed and mimic those other emotional lives to a surprising extent.

In a suggestive paragraph, they suggested that these findings could help to understand group behaviour

which have shaped history, whether they be Hitler fanning hatred to his listeners, Martin King spreading a message of love, or the ways in which crowds behave. And they may even tell us something about the awesome contemporary power of celebrity hood and of the mass media as these agencies of large-scale emotional and cognitive contagion continue to expand their capacities to define reality for billions of people [*Ibidem*, 99].

It is worth noting that such an indirect relationship is embodied in all means of modern communication. In modern society, there are forms of collective interaction and collective behaviour that are magnified by the disruptive development of new information technologies worldwide, including the Internet and social media. With the dramatic rise of text-based social media, there is a huge interest in the influence of mass media and social networks and its contents on public opinion, consumers’ decisions, social and political mood that can be expressed and spread online [Morris *et al.* 2007; Szabo and Hopkinson 2007; Tetlock 2007]. These studies showed that media interpretation of market events, provided by influential economic newspapers, affect subsequent market movements. They found that watching TV news can change people’s moods [Szabo and Hopkinson 2007], while reading newspapers, a headline

regarding national events (such as war, revolution, natural disasters etc.) is significantly linked to depression.

In this regard, Nofsinger and Wang found that firm-specific news releases and macro-economic announcements increased the trading volume of stocks and that the release of macro-level economic news increased the volume of trading of large firms, but had an insignificant impact on small firms. Nevertheless, such media awareness does not necessarily always benefit investors [Nofsinger and Wang 2011]. Another group of researchers found that reading newspaper reports on the stock market and specific stocks lead to higher financial losses than not reading any such reports [DiFonzo and Bordia 1997]. One of the possible explanations of this is that the financial news can mislead investors, making them buy when the prices are increasing and vice versa.

Recently, Cohen-Charash *et al.* [2013] examined the link between the direction of mass media reporting and subsequent changes in the financial market. They claim that indices of reported pleasant mood predicted higher opening stock prices, while indices of reported unpleasant mood predicted lower opening stock prices. Conclusions were that “the influence of news can spill over across domains, influencing the general mood of the population as well as moods pertaining to a specific domain like the stock market” [*Ibidem*].

In a study on consumer confidence, Daas and Puts [2014] found that consumer decisions are influenced by two kinds of emotions, that is by incidental and integral emotions. Unlike the former, integral emotion is relevant for the decision at stake. Contextually, consumer confidence is also likely to be affected by incidental emotions, “as consumer confidence is also not measured in relation to an actual decision to buy something” [*Ibidem*, 19]. Therefore, the sentiment in social media messages might reflect the incidental emotion in the part of the population actively using social media. They argue that this incidental emotion is the “mood of the nation”, when looking at consumer decision making.

An interesting study examined collective discourse messages published on *Twitter* to predict mood in the United Kingdom [Lansdall-Welfare, Lampos, and Cristianini 2012]. By measuring real “nowcasting”, these authors monitored the content of flu epidemics and public mood. They found a correlation between political, economic and social events and the level of joy or anger reflected in tweets. For instance, peaks of joy and happiness corresponded to Christmas and New Year, Valentine’s days and the Royal Wedding in the UK. At the same time, growth in anger noticeably rose after a government announcement of massive cuts in public spending and when some parts of England suffered widespread violence, looting and

arson, or even a peak of public sadness after the death of Amy Winehouse [*Ibidem*, 3].

Similarly, O'Connor *et al.* [2010] analysed *Twitter* sentiment and its connections to the public opinion and presidential job approval polls. About one billion *Twitter* messages posted over the years 2008 and 2009 were used to measure several indicators of consumer confidence and political opinion, obtained from telephone surveys. For consumer confidence, they meant how optimistic the public feels about the state of the economy and their own personal finances. For political opinion, they used two sets of polls – Gallup's daily tracking poll of presidential job approval rating for Barack Obama during 2009 and Gallup's "Economic Confidence" index. Day-to-day sentiment measures were calculated as the number of positive and negative messages. The word list contained about 1,600 and 1,200 words marked as positive and negative respectively without making a distinction between strong and weak words. Results showed that a relatively simple sentiment detector based on *Twitter* text content replicates consumer confidence and presidential job approval polls.

Following a similar method, Bollen, Mao and Zeng [2011] found that the mood of *Twitter* users is linked to the *Dow Jones Industrial Average* (DJIA). They also found that this correlation could forecast the direction of DJIA changes within a degree of 87% accuracy. Based on this content-analysis approach, the authors measured *Twitter* mood according to six dimensions (i.e., calm, alert, sure, vital, happy or kind) by counting how often people published certain words in their "tweets".

Another research tried to predict the US stock market trends using market-monitoring elements derived from public mood. It discovered strong correlations between financial market parameters and *Twitter* sentiments [Rao and Srivastava 2014]. These authors analysed *Twitter* sentiments by looking at more than 4 million tweets from June 2010 to July 2011 and comparing them with the *Dow Jones Industrial Average* (DJIA), NASDAQ-100 and eleven other technological stocks. Findings showed that stock prices and *Twitter* sentiments were highly correlated. Mood changes predicted up to 0.88 of the stock return volatility. The company Downside Hedge [2013] used *Twitter* sentiment for stock market analysis by scanning tweets about specific securities and stock market indexes as well as support and resistance levels.

Williams [2004] studied the impact of managerial mood on perceptions of personal information gathering, personal decisional time deliberation, personal and organisational risk willingness. The sample included about 200 managers who were employed in different sectors (for instance, manufacturing, marketing, finance, information technology banking and others), from a large Southern cosmopolitan city

in the United States. They were assessed with a single item five-point scale labelled with “less” and “more”, where higher scores indicated more positive managerial perceptions. As a result, the author found that managerial mood positively correlated with managerial perception. Therefore, managers might be more willing to undertake risky business decisions when in a more positive affective state. Inversely, individuals in depressed moods are significantly more conservative and risk averse, as the influence of negative mood induction was found to be greater than that of positive mood induction [Yuen and Lee 2003].

#### 4. Measuring Social Mood

The complex nature of social mood implies problems when this phenomenon is constructed and quantitatively measured. Some analysts suggested that financial market indexes can be considered a “socioeconomic” barometer that reflects how people feel about the future. Indeed, standard finance theory suggests that investor expectations should reflect all available information and this should be incorporated into price movements. However, it is possible that other social phenomena, e.g., political elections, social movements, literature trends, the movie market and crime or divorce rates could reflect social mood fluctuations better than price movements in financial markets. The only problem with these alternative indicators is the lack of precise numerical data on many relevant social activities, e.g., messages in popular songs or fashion trends (e.g., hemline lengths, heel heights or the prominence of fashion colours).

For instance, Prechter [2003] and Casti [2010] suggested that long-term trends of stock prices and the length of the women’s skirts are correlated. The popularity of mini-skirts was noticed in the 1920s and in the 1960s, coinciding with the rise of prices on the stock market. On the other hand, in the 1930s and 1970s, long length (the maxi) gained momentum during the downturn of financial indices. Prechter hypothesized that a rise in both hemlines and stock prices reflects a general increase in “friskiness” and daring in the population, while a decline in both was due to a decrease [Prechter 2003, 9]. Furthermore, when the length reached its maximum or minimum, social mood typically reached its positive or negative pole. It is important to note that colour preferences also follow similar changes. Usually brighter colours are associated with market tops, while darker colours with bottoms.

Another alternative indicator is the movie market, in particular, horror movies. Horror movies came into the American public world in 1930-1933, which corresponds to the famous *Dow Jones Industrial* collapse. During this period, five classic

horror movies were produced: *Frankenstein* and *Dracula* in 1931, in the middle of the great bear market, *Dr. Jekyll and Mr. Hyde* during the bear market bottom year in 1932, and *The Mummy* and *King Kong* appeared on the screens in 1933, the year of the economic bottom [*Ibidem*].

Prechter found similar trends in pop music and applied the Wave Principle to the popularity of singers and musical groups during the Twentieth century. Musicians' careers can be considered to be perfectly in line with financial enthusiasm, whereas during hard market times dominant popular singers and groups faded quickly into obscurity to be replaced by styles that reflected the newly emerging mood [*Ibidem*, 13]. For instance, hyper-fast dance music and jazz characterised the bull market of the 1920s. One decade later, the bear market brought "folk music laments" and "mellow ballroom dance music". The upturn of stocks in 1932-1937 led to swing music. After that, in 1937 the wave appearance of girl groups and big band music in 1940 took place, which dominated until the market peaked in 1945-46. Late 1940s stock market correction featured "cool jazz" and "mellow love ballad crooners", both male and female, whose styles reflected the dampened public mood [*Ibidem*, 13]. Closely characterising musical mood, in the mid-1960s, joy, benevolence, fearlessness and love were dominant. The public in the late 1970s felt misery, anger, fear and hate and this was what they wanted to hear [*Ibidem*, 21]. Thus, if the major sentiment of the public mood was "I feel great and I love everybody," it was a sell signal for stocks. Vice versa, if the mood was an expression of agony ("I feel depressed and I hate everybody"), this sent a buy signal [*Ibidem*].

An alternative indicator of mood could be consumer behaviour. For instance, Alan Hall analysed sugar consumption in the US over 200 years and its correlation with mood. The idea was that society craves sugar during periods of positive mood and rejects it during negative mood periods. Hall found that sugar consumption decreased during the bear markets, when a negative mood trend prevailed. The level of consumption rose with the subsequent optimistic mood generated by a bull market [Hall 2014]. Similarly, Ma and Zhang [2015] found a significant cross-correlation between the social mood and sale of *Sony* cameras on *Taobao* (the biggest Chinese e-business company). Their results indicated that social mood was significantly associated with consumption choices and might be used in sales forecasting for particular products.

## 5. Conclusions

Table 1 and Table 2 summarise the main classical sociological studies that could be useful to examine mood and the principal findings drawn from our overview. Although Casti [2010] suggested that social mood is “a feeling or a belief of a group, community, population or society about the future,” social mood cannot be merely reduced to individual expectations about future states or events. Moods are rather socially constructed perceptions by individuals on certain salient features of the social context in which they live, which reflect constructive processes of collective meanings. In this regard, the definition of mood as “collectively shared state of mind” provided by Prechter and Parker [2007] is more convincing, although these “socially induced” perceptions synthesize past and future by anticipating social consequences of actual individual decisions, while their “collectively shared” dimension, in our opinion, lies in the meaningfulness of past-future synthesis perceived by individuals.

□Furthermore, these mood-induced perceptions gain momentum when individuals face a context of uncertainty. In these situations, decision makers are boundedly rational actors who might have limited capabilities and resources and be prone to unconscious herding effect. This has been documented, for example, in the psychological or social contagion of boom thinking [Simon 1957; Prechter 2003], where subjective perceptions and experiences might have a strong influence on decisions, including triggering selective attention and “rule of thumb” heuristics that characterise the way individuals process information. In these cases, behaviour probably follows what Karl Weick defined as “mindfulness”, i.e., a combination of demanding scrutiny of existing expectations, continuous improvement and differentiation of expectations based on newer experiences and capability to develop new expectations that improve foresight and current functioning [Weick 1995; Weick and Sutcliffe 2007]. This requires a reference of individuals to a collective dimension of cognition. Individuals know or perceive that something has happened to other individuals and so constitute a shared social experience. It is this perception that defines mood as a “social construct” that informs and gives sense to certain behaviour.



<b>Tab. 1 The Main Classical Theories on Collective Behaviour</b>		
<b>Classical Sociological Studies</b>	<b>Concepts</b>	<b>Definition/Characteristics</b>
Durkheim [1951]	Suicide (anomic type)	Society instability in which widely accepted rules and values have broken down
Merton [Garfield 1987]	Anomie and Deviant Behaviour	A normative breakdown indicates a gap between people's aspirations and the access to the legitimate means of its achievement
Le Bon [1895]	Theory of Crowd	The power of the crowd increases during social decline, collective mind transforms an individual behaviour
Smelser [2011]	Theory of Collective Behaviour	Generalized opinion or belief is important during periods of social change and political disintegration
Park and Burgess [1921]	Contagion Theory	Social unrest is transmitted by a circular reaction
Blumer [1969a, 1969ab]	Social Infection, Collective Excitation	A rapid, unconscious or irrational distribution of a sentiment impulse of behaviour

Source: Authors' Elaboration.

<b>Tab. 2 Theoretic Framework on the Concept of Social Mood</b>	
<b>Definition of Social Mood</b>	<b>Characteristics</b>
<p>Individual or group feelings or belief about the future [Casti 2010]</p> <p>Reflection of the aggregate mood of individuals [Olson 2006]</p> <p>Collectively shared state of mind [Pretcher and Parker 2007]</p> <p>Socially constructed perceptions by individuals on certain salient features of the social context in which they live, which reflect constructive processes of collective meaning [Ours]</p>	<ul style="list-style-type: none"> <li>• It shapes expectations about the future that are typically formulated under uncertainty</li> <li>• It motivates action via emotion</li> <li>• It is (un)consciously determined by endogenous dynamics in society</li> <li>• It follows a wave pattern</li> <li>• It lasts longer than emotions</li> <li>• It is not directed towards specific objects</li> <li>• It tends to shape rather than being shaped by events</li> <li>• It connects past and future in meaningful representations</li> <li>• It connects domains of meaning that can even be previously disconnected and have no direct meaningful link</li> <li>• It has a constitutive social dimension</li> <li>• It always has positive and negative, extreme states</li> <li>• It has asymmetric effect (negative vs. positive)</li> <li>• Individuals' opinions reflect aggregations of unconscious herding impulses</li> </ul>

Source: Authors' Elaboration.

Our excursus shows that empirical research has been carried out recently especially on the impact of social media on markets and the economy as expressive forms of collective mood [Beber and Brandt 2010; Boero *et al.* 2010; Rao and Srivastava 2014]. The advent of big data can help develop in-depth analysis in detail and extent that were unimaginable previously. For instance, recent studies on the impact of *Twitter* mood on financial markets, in which the impact of collective emotions on market trends was quantitatively analysed, testify to the footprint that social mood might leave on complex systems such as markets [Bollen, Mao, and Zeng 2011].

However, these data-driven approaches still lack solid behavioural and sociological foundations. They are too aggregate to help us understand the mechanisms through which individuals perceive context, the constructive function of mood and examine context-specific implications of individual decisions. Given that there are reasons to believe that our globally connected societies and markets will be even more mood-boosted in the future, big data analysis and sociological studies should find a way to cross-reference each other. This is not only useful to understand social mechanisms through which social mood emerges, develops and evolves. We also need to inform media designers on contexts that can exploit these social forces for good rather than for bad. Our article does not have this ambition. Here, we aim to return to sociological roots and combine sociology, social psychology, economics and data driven analysis to show that the time has come to integrate theory and empiricism.

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## Mood Implications on Social Behaviour in Complex Societies

### A Literature Review

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**Abstract:** This article provides an overview of previous studies on social mood and its implications for social behaviour. While economics and game theory conflate the idea of rationality with rational expectations and objective information, social psychologists and sociologists suggest that individuals are often subject to mood under many different circumstances, from social relationships to voting and consumer behaviour. Evolutionary and behavioural studies suggest that this is far from being “irrational”, although it can lead to unexpected socially undesirable outcomes. By considering research in economics, behavioural sciences, sociology and psychology, our article suggests that social mood should be disentangled from emotions, and we need to discuss the need for a more sophisticated notion of social rationality. Our findings suggest that integrating (big, behavioural, population) data and (psycho-sociological) theory is key to understanding why social mood is increasingly influencing social relationships, economic exchanges and political preferences in complex, globally hyperlinked societies.

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*Keywords:* Social Mood; Emotions; Social Behaviour; Decision Making; Sense-making.

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