Multiple epistemologies in accountability and the role of Post Normal Science in shaping co-accountability

Carla Antonini
Autonomous University of Madrid, Accounting Department and University of Trento Department of Economics and Management

Ericka Costa
University of Trento, Department of Economics and Management

Michele Andreaus
University of Trento, Department of Economics and Management

Caterina Pesci
University of Trento, Department of Economics and Management
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Abstract
This paper addresses the need of finding a renewed understanding of accounting and accountability notions in the perspective of the epistemic approach that they adopt. For this purpose, the study explores neo-positivism, socio-constructionism and Post Normal Science (PNS). In this vein, accountability models related to the dominant neo-positivistic approach develop informative systems that tend to describe reality in axiomatic and static way. As opposed to those grounded on the socio-constructionist paradigm, that describe reality coming from a knowledge that is shared and stratified, thus producing a common view on what reality is. The paper argues that PNS is different when compared to social-constructionism not only in terms of paradigms, but also in terms of ontology because it does not aim to reach an institutionalized reality, but it negotiates flexible solutions for contingent problems by involving stakeholders in the debate. The aim of this study is to inquire theoretically on the potential of PNS, to guide the development of a pragmatic framework of “co-accountability”.

The contribution of this paper is twofold: (a) to introduce PNS as an alternative epistemic position which is worth of exploration and development in practical terms. (b) To explore the development in practical terms of co-accountability applying the three core elements of PNS to find new answers to traditional accountability questions. Aligned with PNS, the paper contends that traditionally unheard actors might have a crucial piece of information essential for an effective decision making and a fast understanding and finding of the solution. As a consequence, co-accountability actively engages and empowers stakeholder not only because is morally fair (plurality of perspectives and commitments) but also because is an effective quality control tool in a changing environment (the scientific management of uncertainty and of quality) that leads to the most effective finding of the solution (the intellectual and social structures that reflect problem-solving activities).

Keywords: accountability; co-accountability; epistemology; ontology, post-normal science.
1 Introduction

This paper aims to provide a theoretical contribution in the realm of the connection between epistemology and accountability. The idea is that multiple epistemologies in accountability are the basis of the development of different typologies of accountability that answer to different cognitive needs. Thus, considering among epistemologies Post Normal Science a new form of accountability, namely the co-accountability, can be shaped and proposed.

The development of different forms of accountability is studied both from the angle of practitioners and academic, consequently accountability forms and frameworks become a constellation in search of an order.

A science, anyway, is a ‘knowledge arranged in an orderly manner’ (Hornby, 1987). Each science is connected with an epistemic position which determines its order in terms of feature and purpose. Accounting and accountability are sciences and are related to epistemic positions that need to be connected with them for achieving an in depth understanding of their nature in terms of features and purposes and for proposing and exploring new forms.

In general terms, the attention to the epistemic issue in the modern era of philosophy and sociology came from the works of Popper (1962) and Kuhn (1962) and called the scientists to focus on the feature of their disciplines and to question the notion of science to which their refer to. After these (Popper, 1962; Kuhn, 1962), contributions that created a dividing line between scientific disciplines and not scientific disciplines, many scholars started to discuss on the nature of their topic of research with the intent of legitimating their studies in scientific terms. In this period of time to recognize the role of accounting as a science was urgent. Accounting scholars needed to legitimate their discipline to the status of science by recognising that they were sharing the same paradigm (Kuhn, 1962) because they were using methods and theories accepted within the community to which they belonged.

Regarding epistemology more specifically related with the accounting and accountability, several researchers have explored different epistemic perspectives (Chua, 1986; Frame and Brown, 2008; Brown, 2009) and their linkage with definitions of accounting and accountability (Roberts, 1985; Gray et al., 1997; Walker, 2016; Russel, 2015; Mashaw, 2006; Rached, 2016).

The contribution of the work of Chua (1986) to the pacific acceptance of accounting as science can be considered a masterpiece that helped accounting scholars to admit the co-existence of different epistemologies within the arena of accounting. Chua (1986) differentiated among the mainstream epistemology (neo-positivist), non-mainstream (socio-constructionism), and critical approach. Chua’s (1986) ideas have been strongly influential and after few years the number of contribution about the epistemic issue in management and accounting became scant (Vollmer, 2009; Lukka, 2010; Malmi, 2010; Merchant, 2010; Moddel, 2010) signalling that the majority of the scholars in these field came to a peaceful acceptance of the conclusions already reached. In that years the scientists moved within accepted paradigms and in a similar situation ‘any debate around the notion of paradigm is typically regarded as a non-issue’ (Lukka, 2010, p.112), consequently scholars showed lack of willingness ‘to engage in intellectual debates on ideas which are not in accordance with their paradigm’ (Malmi, 2010, 121). More recently, the need of new forms of accountability, arguably, leaded to come back to the issue of epistemologies. In addition, the differentiation between ‘monologic’ and ‘dialogic’ accounting and accountability introduced the epistemic issue recognising epistemology as able of shaping two different typologies of accounting and accountability (Frame and Brown, 2008; Brown, 2009). It is worth highlighting that in those aforementioned works, Post Normal Science (PNS) (Funtowicz and Ravetz, 1993) was identified as a method operating under the socio-constructionism umbrella (Berger & Luckmann, 1966), as opposed to a neo-positivism.
approach (Popper, 1962). In this paper, we argue that PNS is an evolution of the socio-constructionist epistemic perspective and that it is able of shaping science differently because of its specificity. In detail, the difference between socio-constructionism and PNS originates by their different ontological positions and the peculiarities of the paradigms in which scientists move. The socio-constructionist paradigm, indeed, does not neglect the possibility of achieving an understanding of ‘the’ institutionalised reality, while PNS is not interested in arriving to one single vision of “reality”, but rather focus on solving new and rapidly changing problems (Funtowicz and Ravetz, 2003).

Although Brown (2009) recognises the necessity of referring to different notions of accounting and accountability building ‘on the work of accounting writers who have located their work in pluralist traditions’ by mentioning Boyce (2000), Dillard and Ruchala (2005), Gray (2002), Morgan (1988), O’Dwyer (2005) and O’Learly (1985). Nevertheless, did not develop in full the role of epistemologies in shaping different notions of accounting and accountability. Indeed, a call for future investigation concerning the relationship between PNS as an alternative epistemic paradigm and accountability is still open (Frame & Brown, 2008; Brown, 2009; Brown and Dillard, 2015). The question remains, is PNS able of shaping different notions of accounting and accountability? Hence, additional studies exploring PNS as an epistemic approach able to shape a new pluralistic form of accountability are needed.

This paper contends that in the current environment in which new technologies are rapidly spreading, the social needs that accountability is called to satisfy (Mashaw, 2016) are likewise rapidly evolving. Consequently, traditional patterns of accounting and accountability, developed in coherence with traditional epistemologies, cannot longer be able of satisfying the need of knowledge required by stakeholders (Costa and Pesci, 2016). The ontological viewpoint connected with traditional patterns of accountability helps in understanding how other frameworks outside of normal sciences and their paradigms can develop.

This paper explores PNS as additional epistemic position which is worth of further exploration and development in practical terms. Furthermore, it develops PNS epistemology in practical terms by proposing a more participatory and pluralistic forms of decision-making in accounting and accountability that follows the exigency of a dynamic environment in which a plethora of stakeholders exists. In this regard, the paper provides a logical path for implementing accounting and accountability when based on PNS epistemology: the co-accountability framework.

The paper is organized as follows: it is firstly discussed the idea that the epistemic approach adopted can shape differently sciences and by introducing the neo-positivist, the socio-constructionist and PNS paradigms is presented the possibility that they can coexist in accounting and accountability for satisfying different knowledge needs; then the notion of accountability is discussed by evidencing its main features and the linkages with the adopted epistemologies; subsequently the PNS paradigm is explored in connection with the main accountability features in order to develop the co-accountability framework. Finally, the conclusion summarizes the argumentation in favour of multiple epistemic paradigms in accounting and accountability and the role of PNS in developing the co-accountability for satisfying new and dynamic stakeholders’ needs.

2 Multiple epistemologies in developing the sciences

2.1 Normal sciences: the Neo-positivist and the socio-constructionist paradigms

Epistemology is the “philosophical study of the nature, origin, and limits of human knowledge” (Martinich & Stroll, 2005). Epistemology is the main object of the philosophy of science that seeks to define the boundaries of what can be considered as science or scientific and what cannot be, by shaping different epistemic positions. In different scientific disciplines different and sometimes
multiple epistemologies can coexist. The debate on which epistemic position should be the most suitable (if any) in accounting and accountability, anyway, is still ongoing (Burrell and Morgan, 1979; Hopper and Powell, 1985; Thompson, 2011; Brown, 2009). Different epistemic approaches own different ontological positions because of their different interpretations of the nature of reality.

The potential coexistence of different epistemologies does not neglect the dominance of one over another. Focusing on accounting and accountability, it seems that these disciplines are dominated by a mainstream approach based on strong quantitative data and analysis (Chua, 1986; Lukka, 2010; Malmi, 2010; Merchant, 2010; Model, 2010; Ahrens et al., 2008; Cooper, 2008). In many accounting frameworks, studies and papers, this approach is applied by following a tradition which has mainly originated in the Anglo-Saxon world (Watts & Zimmerman, 1986; Barth et al., 2000), and which seems to ignore or marginalise the definition of social science (Weber, 1949) and instead it privileges natural scientific methodologies in accounting.

This epistemic position of mainstream accounting thinkers and scholars can be placed under the umbrella of the neo-positivism. Many mainstream scholars seeking to defend a rigorous deductive method use the thoughts of a philosopher often considered as sui generis neo-positivist: Karl Popper (1902-1994).

In Popper’s epistemology described in ‘Conjectures and refutations’ (1962) the philosopher introduces a concept called the ‘falsification principle’. Popper (1962) claims that each scientific theory is valid until or unless it can be falsified by new experiments and new findings that are able to falsify the previous conclusions. The resulting idea is that scientific knowledge comes from (testable) hypothesis resulting from experience or rigorous theories that can be submitted to the falsification principle. This epistemic view is connected with the development of testable theories for achieving knowledge. Axioms, definitions and theories should be developed and tested and until remain valid they can be part of the current shared scientific knowledge. Consequently, even the tendency to develop stable sets of testable rules for defining sciences such as accounting and accountability, can be considered as an effort to develop these disciplines in conformity with the neo-positivist idea of science (Brown, 2009). The existence of Conceptual Frameworks mainly based on ‘true and fair’ views in accounting and accountability shows the development of rules and axioms able of a priori defining these sciences (Brown, 2009). Definitions, rules and axioms are not static, but constantly object of changes addressed at improving the systems. Accounting and accountability in this view can be considered developing sciences that meet the epistemic position of neo-positivism in which scientists are building testable theories which improvement depends by the possibility of their falsification. Each falsified axiom or rule should be re-thought and re-shaped, for overtaking the falsification tests. Accounting and accountability in this perspective can maintain their status of sciences until the content of their frameworks, axioms and rules, can be improved by continuous conjectures and refutations. In this philosophical understanding, sciences are subject to the process of conjectures and refutations in order to evolve and to fit the reality they want to describe. The abovementioned neo-positivistic approach is considered the mainstream approach in accounting and accountability, but also in science in general. Kuhn (1962) explains the dominance of this paradigm by arguing that revolution in sciences determines the rise of new paradigms. The dominance of neo-positivistic stance follows the scientific revolution occurred in natural sciences during 20th century (Kuhn, 1962). The ontological idea connected with this epistemic position is that the scientist is searching for ‘the’ truth, by testing rules or theories supposed to be connected with explanations of ‘the’ reality. In this position ‘truth’ or ‘reality’ is supposed to be something objective existing outside of the individual, that individuals can experience in their everyday life. The focus is on how to detect reality searching for general rules explaining phenomena occurring in its flowing.

The neo-positivistic approach adopted by the mainstream accounting and accountability scholars, can be placed under the definition of normal science (Kuhn, 1962) because scientists adhere to a recognised paradigm in which methods and theories are recognised by their scientific community. In
substance, methods and theories are taken for granted and the community of scientists solves some puzzles within the paradigm (Kuhn, 1962).

The dominant epistemology (neo-positivist) of accounting and accountability is not shared by all the scholars, in particular in the arena of critical accounting thinkers. In this literature, indeed, an increasing tension exists between the neo-positivist approach – that is the most widespread in the realm of natural science – and an opposite school of thought which see the development and the feature of these disciplines closer to social sciences (Chua, 1986; Morgan, 1983; Laughlin, 1995; Burrell & Morgan, 1979). As already explained in the introduction Chua (1986) defined neo-positivism as the dominant epistemology in management, accounting and accountability. The author (Chua, 1986), anyway, recognised the existence of alternative epistemologies (socio-constructionism and critical) that are worth of consideration because their ability of solving different scientific problems. Later, Laughlin’s (1995) work introduces the epistemic issue and proposes a range of alternative approaches available based on the thoughts of some key philosophers who have generated these alternatives. Laughlin’s (1995) paper has the merit of opening a debate among management and accounting scholars. In particular Lowe (2004a), by basing his arguments on Bruno Latour’s (de-)constructionist ideas, distinguished three paths within the sociology of scientific science: the empirical relativist program (Collins, 1981; 1983; Pinch, 1986); the constructionist program (Knorr Cetina, 1981, 1996; Latour and Woolgar, 1979); and the theory of social interest (Barnes, 1977, 1982; Bloor, 1982, 1991; Shapin and Schaffer, 1995). The socio-constructionist program appears to be the most used epistemic approach in accounting and management after the neo-positivistic one and many contributions defend its application and use in these disciplines (Quattrone, 2004; Frame and Brown, 2008; Brown, 2009).

Socio-constructionism is an epistemic position coming from sociology and it is based on constructivism, which is a theory of learning (Piaget, 1929; Kelly, 1955). In this regard, Berger & Luckmann (1966) explain that every action that is frequently repeated it is crystallized according to a fixed scheme, which can therefore be reproduced and perceived objectivized and institutionalized. Habituation also implies that the action can still be performed in the future and knowledge can be transmitted to the next generations. Institutionalized knowledge is learned as an objective truth in the course of socialization and then internalized as subjective reality. The institutional world, therefore, own a specific ontology because it appears to be an objective reality that can be known and spread through in the form of socially shared culture (Berger & Luckmann, 1966). In this understanding, accounting and accountability are socially constructed disciplines which are generally accepted and the knowledge of reality that they can produce is derived by a cumulative and collaborative process of previously accepted and institutionalized notions. Even under this approach scientist move within the boundaries of a recognised and shared paradigm (Kuhn, 1962) in which methods and theories are established and not discussed.

The underpinned ontological idea of these approaches is that science should be an instrument for achieving a better understanding of reality. Both neo-positivism and socio-constructionism, indeed, stretch asymptotically to describe reality; which in the first case is external to the individual, while in the second is socially constructed. Accounting and accountability when understood within these paradigms develop frameworks for better achieving the scope of describing and measuring the impacts of the existence of different types of organizations and they can be considered normal sciences (Kuhn, 1962). Indeed, accounting and accountability can be seen as ‘a collective project in social science, a project set to grow towards some state of maturity’ (Vollmer, 2009).

The so-called normal sciences (Kuhn, 1962) and the connected epistemic approaches, anyhow, develop in contexts characterized by a certain degree of stability, with the aim of achieving a shared and as much as possible stable knowledge.
In sum, the authors have shown that accounting and accountability sciences are often related to the dominant neo-positivistic approach that develops informative systems that describe reality in axiomatic terms (Dillard and Ruchala, 2005) and which informative value can be improved only by testing that axioms and rules (Popper, 1962). When accounting and accountability are grounded on the socio-constructionist paradigm (Berger & Luckmann, 1966), they are considered able of generating a type of knowledge that develops by institutionalising insights valid within a social community. In this approach, knowledge is shared and stratified producing a common view on what reality is. Both the abovementioned paradigms, however, from an ontological perspective, produce a type of knowledge which scope is to arrive to describe (a more or less) objective reality, “the” scientific reality.

The epistemic paradigms underpinning the notions of accounting and accountability are not static, but they evolve developing slowly, through frameworks, axioms and rules to be tested or to be stratified in order to reach an improved knowledge that in ontological terms tend to reach a representation of ‘the reality’. PNS, conversely, is an epistemic paradigm able of shaping a knowledge rapidly evolving and aiming at satisfying informative needs connected with dynamic environments (Funtowicz and Ravetz, 1993; 2003). This epistemic position is helpful for developing and understanding accounting and accountability when they do not aim at describing reality in absolute terms, but when they are catching that part of reality (or simply information) useful for stakeholders in a certain moment for obtaining knowledge on topics considered of interest for certain purposes. This epistemic paradigm is continuously evolving and subject to constant negotiation among the parties interested to retrieve new dynamic knowledge. In ontological terms, PNS does not aim to arrive to ‘the’ truth, to understand ‘the’ reality, but to produce useful knowledge, which can be considered real or true until it is useful to the stakeholders. Adopting a PNS approach, accountability becomes a matter of continuous deliberations and negotiations (Strand, 2017).

2.2 The Post Normal Science (PNS)

The PNS approach was first introduced by Funtowicz and Ravetz (1991) as an alternative epistemic approach for generating knowledge, shifting from the traditional individual agency, top-down approach of science to more participatory forms of research governance. PNS epistemic paradigm is able of shaping a rapidly evolving knowledge and it is aimed at satisfying informative needs that keep changing over time (Funtowicz and Ravetz, 1991; 1993; 1994; 2003). PNS epistemology differs from neo-positivism and constructionism in ontological terms given that is not searching for an absolute scientific truth but it replaces ‘truth’ by ‘quality’ as its core (Funtowicz and Ravetz, 2003, p. 4). Furthermore, PNS requires the involvement of multiple stakeholders in a process of negotiation regarding the knowledge they need to obtain, consequently it deeply differs from the mainly adopted accounting and accountability epistemic positions (neo-positivism and constructionism).

Consequently, this epistemic position is helpful for developing an understanding of sciences such as accounting and accountability when they do not aim at describing reality in absolute terms. In particular, accounting and accountability under PNS can develop for the specific purposes of achieving an understanding of a focused and necessarily partial reality, useful for stakeholders in a certain moment for obtaining knowledge on topics considered of interest for certain purposes. This epistemic paradigm is continuously evolving and subject to constant negotiation among the parties interested to retrieve new dynamic knowledge (Strand, 2017). As anticipated, PNS does not aim to arrive to ‘the truth’, to understand ‘the’ reality, but it is aimed at producing knowledge, which can be considered real until it is useful to the interested actors (Funtowicz and Ravetz, 1993).

Under PNS approach, methods and theories are in constant development and they are not taken for granted. More in detail, the approach of PNS proposes three core and interrelated elements: (i) the
plurality of perspectives and commitments, (ii) the scientific management of uncertainty and of quality, and (iii) the intellectual and social structures that reflect problem-solving activities (Funtowicz and Ravetz, 1994).

The plurality of perspectives and commitments in PNS refers to the fact that the scientific truth per se is no longer attainable, desirable nor relevant (Funtowicz and Ravetz, 1994). Thus, it is indispensable to engage a diversity of participants in the dialogue for solving specific issues and for negotiating useful solutions, which is the real aim of science when based on PNS. For example, if accounting and accountability develop under a plurality of perspectives, they should go beyond individual perspectives to negotiate and mediate the issues at stake. Under this perspective, these sciences should engage stakeholders in the process of designing and continuously updating knowledge and processes through time.

In addition, multi-stakeholder perspectives become crucial when dealing with complex issues. If one seeks to understand these issues in a particular context, those directly affected by the issue are more likely to have an in-depth insight of the problem and alternatives to address it (Jasanoff, 2007; Gallotti and Frith, 2013; Janssen and Ostrom, 2006). Therefore, the participatory nature of PNS is essential to assess the robustness of the accountability framework that in this epistemic paradigm is co-generated (Bebbington and Larrinaga, 2014; Funtowicz & Ravetz, 1993; Funtowicz & Ravetz, 1999; Gold and Sudgen, 2007).

The scientific management of uncertainty and of quality is focused on the fact that the high level of uncertainty related with some issues forces PNS to take at least three considerations. First, to take a more cautious approach regarding arguments based in quantitative analysis. There is no empirical science completely free from uncertainty (Funtowicz and Ravetz, 1990; McKernan, 2007), thus, the challenging task is to manage uncertainty in a way to maximize simultaneously the quantity and quality of information. Maximizing quantity refers to avoid duplication, redundancy and/or overload of information, while maximizing quality refers to get the most out of the information obtained. In other words, to improve the relationship between quantity and quality of information obtained for decision-making (Funtowicz and Ravetz, 1994). Second, to recognize the presence and legitimacy of value commitments. Ethical complexities are central to the resolution of problems and the proper management of uncertainty and quality. Third, to recognize and respect that every stakeholder has a relevant contribution to the solution. Considering multiple perspectives is not merely a moral and/or ethical exercise but also a recognition that multiple perspectives contribute to understand better the problem and, therefore, finding faster and more effective solution.

The intellectual and social structures that reflect problem-solving activities represent another of the specific features of PNS. Under a PNS approach, ethical concerns must be central to the science and based on the respect and tolerance of multiple perspectives (O’Connor, 1999; Gluckman, 1972). As a consequence, researchers engage in practical issues and policy making as much as in theoretical development. Traditionally, scientists claim credit for all the benefits from the research and blame society for any harm made with the application of their findings, thus, separating research from policy issues, ethic concerns and advocacy. Ethical commitment should not be constricted to the mere process and/or product development but expanded to its use or abuse (Funtowicz and Ravetz, 1994).

2.3 Comparison of epistemologies and its connected typology of science

The following table summarizes the different notions of knowledge and sciences derived by the epistemic paradigms previously described.
<table>
<thead>
<tr>
<th>Epistemic Position</th>
<th>Notion of knowledge</th>
<th>Ontology</th>
<th>Paradigm</th>
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<tbody>
<tr>
<td>Neo-positivist</td>
<td>Set of <em>axioms</em> and <em>rules</em> defined and tested, which improvement is due to the possibility of passing falsification tests.</td>
<td>Science is derived by frameworks containing axioms, that in ontological terms are considered able of properly describing ‘the’ reality until falsification tests are passed.</td>
<td>As in normal sciences there is a shared paradigm that recognises specific methods and theories that as result are taken for granted. Methods and theories are a marginal issue till the moment in which a crisis of paradigm occurs.</td>
</tr>
<tr>
<td>Socio-Constructionist</td>
<td><em>Institutionalized</em> knowledge that can be improved by further concepts that become generally accepted and consequently institutionalized</td>
<td>Science is based upon evolving frameworks which improvement is due to new cumulative institutionalized knowledge that from an ontological viewpoint forms a social constructed reality.</td>
<td>As in normal sciences, there is a shared paradigm that recognises specific methods and theories that as result are taken for granted. Methods and theories are a marginal issue till the moment in which a crisis of paradigm occurs.</td>
</tr>
<tr>
<td>Post Normal Science</td>
<td>Knowledge is the result of <em>negotiation</em> among different involved parties for solving specific issues and obtaining the related solutions</td>
<td>Science uses flexible frameworks useful in a certain context for negotiating the needed knowledge for certain purposes; in other words the ontological issue does not matter because this epistemic approach does not aim to arrive to 'the truth' or to 'the' knowledge, but this concept is replaced with the concept of ‘quality’ of the achieved results.</td>
<td>In post normal science methods and theories are not taken for granted but they are object of negotiation among the different involved parties.</td>
</tr>
</tbody>
</table>

Table 1 Epistemic positions and the connected typology of science
Depending on the epistemic position adopted, it is possible to arrive to different notions of science connected with the notions of knowledge on which they are based upon. Consequently, accounting and accountability can shape differently depending on the epistemic paradigm to which they refer to. None of these notions should be considered superior to the other, but instead when developing a certain type of accounting and accountability the scholars and the interested stakeholders should have in mind the typology of knowledge they need to retrieve.

3 Multiple epistemologies in the development of accounting and accountability

This section provide a review of the notion of accountability and its wide development under the “normal science” umbrella (Vollmer, 2009), both in terms of neo-positivism and socio-constructionism.

3.1 Unpacking the definition of accountability

Even though the definitions of accounting and accountability seem to be shared by scholars and taught within accounting many classes by referring to precise and well-known references (Roberts and Scapens, 1985; Roberts, 1991; Mashaw, 2006; Brown, 2008; Rached, 2016); scholars are still far from adopting a unique definition of accounting and accountability (Walker, 2016; Russel, 2015).

Accounting has been seen for many years as a ‘neutral set of techniques which passively and objectively record and represent the results of organizational activity” (Roberts, 1991, p. 355). Indeed, accounting theory argues that in general collected information need to be punctual, accurate and timely in order to make informed decisions and hold companies accountable. However, the discussion about “what kind of information” is pertaining to accounting and “which stakeholders” are touched by the accounting information can vary considerable on the basis of different regimes the accounting and the accountability are engaged (Mashaw, 2006; Brown, 2009).

Conventional accounting argues that the accounting information is primary addressed to the shareholders (or owners) which are rational economic actors who are interest to the economic and financial dimension of the transactions among the organization and the society (Roberts, 1991; Brown, 2009). Social and environmental accounting enlarges these perspectives and it considers a plurality of dimensions, i.e. economic, financial, social, environmental, political and cultural to multiple stakeholders, not only the owners, but also the customers, the employees, the suppliers, the funders and in general all the society at large (Gray, 2002). According to this broader view, accountability is considered as the duty of being accountable for organizational actions and impacts to different typologies of stakeholders (Gray et al., 1997).

Many other definitions and classifications of accounting and accountability has been provided in the literature during the last forty years (Roberts, 1991), but few of them have addressed the epistemic discussion about this science. The different definitions of accountability, anyway, agree upon the idea that accountability is a ‘social practice’ (Roberts, 1991, p. 356) and a relational concept (O’Dwyer et al., 2005; Costa and Pesci, 2016) where the actors of this relationship are sometimes vague and not well-specified. At the heart of the accountability process there is a social acknowledgment that the action of one actor make a difference to both self and the other actors/stakeholder involved (Roberts, 1991).

In order to unpack the accountability complexities and to better understand who are the stakeholders involved in this social process, Mashaw (2006) proposes an analytical definition of accountability based on six crucial “building blocks” or questions (Rached, 2016), as follows:
1. who is accountable?
2. to whom?
3. what they have to be account for?
4. what process need accountability to follow?
5. by what standards need the accountability behaviour be judged?
6. what effects/consequences produce a breach of these standard?

Accordingly, any attempt to contribute to the debate around the accountability notion will revolve around this fundamental formal pattern (Mashaw, 2006; Rached, 2016) which is the starting point to better comprehend the epistemic differences in the accountability definitions (see the paragraph #4) and to present the co-accountability framework developed in this paper.

The abovementioned building blocks are connected to some issues worth of serious consideration that herein can be briefly recap. The first and second questions brings forward the subjects of an accountability relation, where the accountee (or power-holder) and the account-holder are involved. The relationship between these two agents is inherently normative, it is related with the responsibility that arises within the power-holder (i.e. an individual or an organization) from the rights and power to fulfil a promise to the account-holder (i.e. different sets of multiple stakeholders). The relationship among power-holder and account-holder is based on two important aspects: first, there is not a single specification of these variables, who is accountable to whom depends on different individual perspectives, and different needs of multiple stakeholders (O’Dwyer et al., 2005; Bebbingont et al, 2007; Costa and Pesci, 2016); account-holder and power holder has not been conceived as individual intention (the power-holder is accounting to the account-holder and the account-holder is demanding accounting to the power-holder) but more explanations in terms of “collective intentions” – those associated with joint actions – is needed (Funtowicz and Ravetz, 1993, 2003; Gold and Sugden, 2007).

The third question specifies the object of accountability, that is, “for what” the power-holder needs to provide an account to the account-holder. It refers to dimensions, aspects to be measured and indicators able to assess performance. In the literature, the “for what” accountability debate has mainly be addressed by considering advantages and limitation of adopting a strong focus on monetary performance measurement versus a more holistic view which is able to include social and environmental performances (Brown, 2009; Bebbingont et al, 2007; Larrinaga and Bebbingont 2014; Costa an Pesci, 2016). The risk of monetization of non-economic values is that monetization will lead to all activities becoming socially constructed as “economic” (Bebbingont et al., 2007; Brown, 2009). Indeed, as O’Conner (2000) explains, individuals and groups with different orientations will conceive their “frontiers of monetization” differently, therefore a reasoning on the kinds of values (monetary and/or non-monetary) involved the accountability question is required (Brown, 2009).

The fourth question specifies processes and procedures that put accountability in place and the specific time in which the accountability is carried on. According to Rached (2016) procedures can range from a variety of balances between transparency and confidentiality. A minimum of transparency is though required because accountability with no transparency is ineffective given that do not provide information to place (or not) trust (O’Neill, 2002). Related to the process is the temporal perspective that reflects the moment in which accountability takes place. Accountability ex post is carried after the organization’s decision making. In this case, stakeholders are only informed about decisions that have already taken place, participating thus, only in the lower steps of the accountability ladder: manipulation, therapy and informing (Rixon, 2010). On the contrary, accountability ex ante considers mechanisms of preventive control and it should be done before the decision-making process (Mashaw, 2006).

The fifth question refers to the benchmark of judgment to which the power holder is held (Rached,
2016). After the standards are set, the power holder provides information and justification allowing the account holder to assess the decision/actions relative to the standards. These standards are considered such as other evaluative criteria, i.e. laws, regulations, shared codes and they can considerable vary in terms of degree of flexibility. In order to define accountability standard and benchmarks, many scholars have discussed regarding the role of experts and non-experts in providing and contributing to its definition (Brown, 2009; Jasanoff, 2003; Frame and Brown, 2008). Brown (2009), for instance, considers the possibility to introduce peer communities in order to accommodate the opinions of stakeholders not previously recognised as “experts”. This approach not only offers new resources for thinking about the relationship between “experts” and “non-technical experts” but it also provides reasons for more active public involvement in domains of technical decision-making in an open discursive community (Jasanoff, 2003).

Finally, the sixth question represents the consequences that the accountee or power-holder has to face after the performance evaluation. Consequences could be sanctions in case of not delivering appropriately its responsibilities, rewards in case of good performance or redefinition of roles and responsibilities in case of strategy redefinition (Andreoni et al., 2003). The idea of the consequences or effects about accountabilities which do not respect the benchmarks relates to two main issues: i) the adoption of reinforcing mechanisms that can foster the power-holder to meet the standard (Andreoni et al., 2003) and ii) the role of responsibilities (Schlenker et al., 1994). In terms of reinforcing mechanisms, Andreoni et al. (2003) argue that the combination of rewards and punishments had a very strong effect in terms of cooperation among the stakeholders; indeed, in a “Carrot-Stick” approach rewards and punishments act to complement one another. In terms of responsibility, Schlenker et al. (1994) proposes a “triangle model of responsibility” according to which different elements may define diverse driver of responsibility within accountability. In their view responsibility is “the adhesive that connects an actor to an event and to relevant prescriptions that should govern conduct” (p. 635) and it therefore represents basis for judgment and sanctioning.

By summarizing these accountability questions, it emerges that accountability implies a relationship between two or more stakeholders who are required to give an account for their actions (Roberts and Scapens, 1985). This relationship highlights that information is crucial for accountability not only as a right of the person who receives the information (power-holder) but also as a duty of the person that provides the account (account-holder). In the academic debate, the issues of the relational dimension of accountability (Gray, 2002) and the ‘socializing form of accountability’ (Roberts, 1991) have become core.

Indeed, in recent years, there has been an increased need of “new form of accounting” and accountability that promote and facilitate more participatory forms of decision-making (Boyce, 2000; Gray, 2002; Gray et al., 1997; Morgan, 1988; O’Dwyer, 2005; O’Leary, 1985). This is particularly evident in the social and environmental accounting stream of research, where various scholars have promoted new attempts of explicitly dialogic accounting and forms of engagement which are able to foster participatory and social change (Bebbington et al., 2007; Frame and Brown, 2008; Thomson and Bebbington, 2005; Brown, 2009, Brown and Dillard, 2015). Starting from the early work of Gray et al. (1997) in which the authors claimed that accountability is “related to the rights to information of a participatory democratic society” (Gray et al., 1997, p. 329), a more pluralistic and participatory form of accounting and accountability is nowadays advocated (Brown and Dillard, 2015). A more participative accounting and accountability systems can facilitate social change, thus questioning that accountability regimes reinforce the status quo (Celerier and Cuenca, 2015).

Within this broad debate on the accountability possibilities, few studies have addressed the relationship between the epistemologies adopted in accountability and the typology of accountability that develops around the discussed building blocks. The next paragraph will introduce this discussion.
3.2 Monologic versus dialogic accounting and accountability and the epistemic issue

The debate about the different form of accounting and accountability has been also partially addressed from an epistemic viewpoint. Indeed the study of Brown (2009) proposes the distinction between monologic and dialogic accountability based on the different epistemic approaches connected with these forms of accountability (Brown, 2009).

According to the monologic form of accounting and accountability, it is possible to reach a “true and fair view” of the reality through the adoption of well-defined technical instruments (i.e., bookkeeping, budgeting, performance measurement, reporting and auditing, standard-setting, cost-benefit analysis) which are also hardwired institutionally (Brown and Dillard, 2015). Indeed, Brown (2009) considers that monologic accountability mainly pertains to the neo-classical view of the businessman and business organisations, in which the rational economic agent develops economic and financial transactions in order to maximize profit return for shareholders/owners (Jensen, 2002). Within the monologic accountability approach, technical experts provide scientific knowledge to decision-makers in order to produce technical answers to pre-given goals (Brown, 2009). The role of stakeholder engagement and democratic participation of stakeholders is limited to confirm knowledge to the pre-existing “truth” that has been built by the expert and the competing views are limited in order to reduce managerial complexity. As such, they delimit the spaces for debate and refuse voice to alternative perspectives. Therefore, the stakeholder engagement is still relatively linear and unidirectional in the monologic approach (Stirling, 2008; Brown and Dillard 2015), and the adoption of terms such as “bottom-up participation” or “downward accountability” risk reinforcing hierarchies among organizations and stakeholders. This view of accountability chimes with the neo-positivist epistemic stance and posits accounting and accountability within the paradigm of ‘mature’ normal sciences (Khun, 1962; Vollmer, 2009).

In contrast to monologic accountability, dialogic accountability proposes a different socio-political perspective where the focus is both on individuals, collectivities and companies as multiple actors of the society. Within a socio-constructionist epistemic paradigm, dialogic accountability “is not concerned with discovery of an ‘infallible truth’, but rather with discussing actants’ values and priorities in ‘democratic’ processes of decision making” (Hillier and Healey (2010, p. 387). The accounting and accountability reality is positioned in the realm of social constructs.

In the dialogic accountability perspective, the reality is not something static, absolute or unchangeable, but on the contrary, decision are shaped and negotiated by all the stakeholders/participants engaged in the situated context (i.e. business, State, professional, civil society…) and in a very specific timeframe. This means that there is no “universal truth” that can be applied to other contexts or situations, because the knowledge that has been developed by those stakeholders in those situations is not replicable (Brown and Dillard, 2015). Therefore, dialogic accountability differs from monologic accountability because it is “multi-voiced” and attuned to a diversity of stakeholders’ value and interests. The “voice” of these different stakeholders form a multiplicity of expert knowledge, which is thus oriented at supporting progressive change through the democratization of accounting (Brown and Dillard, 2015).

In recognizing heterogeneity and multiple perspectives, dialogic accounting and accountability refuses to privilege capital markets, thus allowing a more pluralist expression of public interest “mitigating the dominance of instrumental rationality” (Dillard and Ruchala, 2005, p. 621). Dialogic accounting and accountability reject the idea of a standardized and universal narrative, preferring “to think of societies as contests of narratives” (Addis, 1992, p. 649). These disciplines, thus become viewed as vehicles with the potential to foster social interaction rather than a set of techniques to maximize shareholder wealth and construct “governable” others (Miller and O’Leary, 1987).

With specific reference to the social and environmental literature, the dialogic perspective brings the
idea to develop models based on a multi-dimensional and participative approach that is sensitive to power differentials in society (Bebbington et al., 2007; Frame and Brown, 2008; O’Dwyer, 2005; Thomson and Bebbington, 2004, 2005). Bebbington et al. (2007), for instance, advocate a social and environmental accounting that takes stakeholder engagement seriously, where the “usual” roles of principal and agent are more fluid and different stakeholders could have a greater voice in defining accountability. Dialogic accountability within the social and environmental accounting stream, recognizes conflicts among stakeholders, engages multiple viewpoints and explicitly addresses power dynamics (Thomson and Bebbington, 2005). They call for the unitary lens of monologic accounting to be replaced with a polyvocal citizenship perspective (Gray et al., 1997). Dialogic thinking accepts the complexity of working with a multi-voiced process because it consider this an essential way of engaging with lived reality (Bebbigton et al., 2007).

In order to make dialogic accountability functioning, Brown (2009) proposes a set of key principles as the most relevant: i) the need to recognize a diversity of ideological orientations; ii) the importance of avoiding “monetary reductionism”; iii) being open about the inherent contestability of calculations; enabling access for “non-experts”; iv) ensuring effective participatory processes; v) being attentive to power relations; vi) recognizing the transformative potential of dialogic accounting; and vii) resisting new forms of monologism.

In summary, the contribution of Brown (2009) to the understanding of monologic versus dialogic accountability has been relevant in order to positioning these concepts within different epistemic positions. As previously said, monologic accountability pertains mainly to a neo-positivist view, while the dialogic accountability mainly belongs to the social constructionism. In explaining the peculiarities of dialogic accountability through a set of specific principles, Brown (2009) also helped in better understanding the differences among the two extremes of accountability in producing different knowledge. Moreover, she introduced the PNS approach in discussing some specific principles, i.e. “Avoid monetary reductionism” and “Enable accessibility for non-experts”. However, both forms of accountability (monologic and dialogic) still belong to the ‘normal science’ epistemology (Vollmer, 2009).

In contrast to “normal science” (Khun, 1962), PNS advocates for a plurality of legitimate perspectives which can work in a situated context (Funtowicz and Ravetz, 1993) and could therefore help us to find new answers for the six accountability questions, by designing a new framework of accountability: “the co-accountability framework”.

4- Applying PNS to accountability: the co-accountability framework

Brown’s (2009) idea of distinguishing between monologic and dialogic accounting and accountability and the connected epistemic issue, open to further insights. In particular, in this paper we contend that the proposed distinction (Brown, 2009) do not completely describes the current evolution of accounting and accountability neither in terms of epistemology nor in terms of questions connected with the building blocks of accountability (Rached, 2016). We propose to deepen the epistemic perspective by presenting the co-accountability framework under the PNS umbrella in connection with the six-accountability questions proposed by Rached (2016).

The co-accountability framework aims to satisfy the current needs of information expressed by several stakeholders whom require prompt disclosure about new and protean issues. The prefix “co” implies usually several meanings such as collaboration, mutual, reciprocal, assistance. Of particular
interest of this study are two specific meanings\(^1\): (i) together, joint, jointly, as in “coexist” and (ii) one that is associated in an action with another partner as in “co-author”.

Although in the first aforementioned meaning, co-accountability could arguably be equated with dialogic accountability, where different stakeholders are invited to participate and together, jointly in the process of accountability and a participatory process of negotiation of interests and information is required. Nevertheless, in the second meaning, co-accountability attempts to make a breakthrough. It aims to transform all stakeholders co-accountable as in “co-authors” and it is intrinsically linked with the action of problem-solving. More specifically, it aims to stop seeing “power holders” and “account-holders” as different sides of the coin but to flip into a system in which engaged stakeholders share power, rights and responsibilities. This is an idealistic view that surely represents challenges in the operationalization but it is also a response to find solutions that enable the legitimation of expert and non-expert knowledge in the search of an effective problem-solving activity.

Table 2 examines how each of the discussed frameworks (monologic, dialogic and co-accountability) addresses each of the six-accountability questions (Rached, 2016). Additionally, this section presents the exploration of the link between the three elements of PNS presented in section 2. Finally, a detailed description of this framework is provided in order to better understand how it works in response to the needs of the stakeholders and a discussion is provided on the main challenges in implementing co-accountability.

In describing the co-accountability framework in connection with PNS the building blocks of accounting and accountability (Rached, 2016) are operationalized into variables as follows: the first question “Who is accountable” is represented by variable A. The question: “To whom” is represented by B. The question: “What they have to account for” is represented by variable C. Subsequently, variable D represents “which process needs accountability to follow. Variable E, represents “by what standards need the accountability be judged”. Finally, the question “What effects/consequences produce a breach of standards” is represented by F. Briefly, the accountability model can be described as: “A” accounts to “B”, for “C”, based on “D” and “E” standards and procedures, subject to “F” consequences.

These questions transformed in variables are the key analytical prisms to understand the disputes and arguments about accountability. The following Table discloses each of this variable and questions in relation to the different accountability frameworks.

Table 2 – Comparison of answers to the six-accountability questions within the monologic, dialogic and co-accountability frameworks

<table>
<thead>
<tr>
<th>Accountability questions (A-F variables)</th>
<th>Accountability frameworks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal science</td>
</tr>
<tr>
<td>Neopositivism</td>
<td>Neo-positivism</td>
</tr>
<tr>
<td>Monologic accountability</td>
<td>Recognize single ideological orientations</td>
</tr>
<tr>
<td>(A) who is accountable?</td>
<td>Monologic accountability assumes that rational economic man, which</td>
</tr>
</tbody>
</table>

\(^1\) https://www.merriam-webster.com/dictionary/co
<table>
<thead>
<tr>
<th>(B) to whom?</th>
<th>Focus on shareholders</th>
<th>Recognize multiple ideological orientations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monologic accountability is mainly oriented to satisfy the profit maximization need of shareholders. Traditional figure of the power-holder</td>
<td>Dialogic accountability is oriented to a broad set of stakeholders. It facilitates the expression of different perspectives and encourages democratic interaction across perspectival borders. Traditional figure of the power-holder</td>
<td>Power and account holders participate in the whole process of selecting and measuring assessment indicators. Assessment intends to become a learning tool for achieving common goals.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(C) what they have to be account for?</th>
<th>Focus on monetary performance</th>
<th>Avoid “monetary reductionism”</th>
</tr>
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<tbody>
<tr>
<td>According to some scholars, the focus on monetization is consistent with a neo-classical economic view of humans (Sagoff, 1998; Sinden, 2004). Within monologic view, accountability could refer exclusively to financial resources or, more precisely only to resources that can be measured in financial terms.</td>
<td>Impacts should not be reduced into a single “bottom line”, rather it is important to adopt a plurality of perspectives able to encompass both quantitative and qualitative data.</td>
<td>Power and account holders participate along the whole accountability process. Since the inception of mission and goals, measurement, assessment, to the redefinition of strategies if needed. Traditionally unheard actors might have a crucial piece of information essential for an effective decision making.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(D) what process need accountability to follow?</th>
<th>Limit participatory processes to unidirectional engagement</th>
<th>Ensure effective participatory processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional accountability frameworks have a top-down perspective regarding procedures, as a consequence the level of transparency is decided by the power-holder and which traditionally ends in financially-centred frameworks.</td>
<td>In dialogic accountability, the process is based on democratic participation. Following on participatory approach both inside and outside accounting, dialogic accountability suggests to involve stakeholders early in the process and to develop procedural rules (Owen et al., 2001).</td>
<td>Power and account holders participate along the whole accountability process. Since the inception of mission and goals, measurement, assessment, to the redefinition of strategies if needed. Traditionally unheard actors might have a crucial piece of information essential for an effective decision making.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(E) by what standards need the accountability behaviour be judged?</th>
<th>Exclude accessibility for non-experts</th>
<th>Enable accessibility for non-experts</th>
<th>Promotes a dialogue of experts and non-experts and the revision of standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>In monologic accounting, the adoption of universal standard is supported by the idea that “technical” information is helpful in excluding people from the political process. In this approach, experts themselves cultivate a great self-awareness of the values and assumptions underpinning their models and standards and the dialogue with other non-technical</td>
<td>Dialogic accounting does not use universal standard and, on the contrary, it promotes the development of extended peer community quality assurance processes where scientists are expected to communicate epistemic and ethical uncertainties to stakeholders audiences. Information should be provided in multi-layered ways—in forms that are accessible</td>
<td>Co-accountability promotes the use of extended peer community quality assurance processes and allows the democratic revision of standards when needed. Information should be provided in an open and dynamic way allowing involved stakeholders to not only consult information but also being able to modify it.</td>
<td></td>
</tr>
</tbody>
</table>
stakeholders become hard. to non-specialists and in more technical forms that enable independent testing

Co-accountability is problem solving oriented. The main consequence is that a breach of standards produces a revision of the strategy to ensure that either the breach or the goals are corrected.

These accountability frameworks do not differ only in terms of building blocks questions (Rached, 2016), but their main differences and issues can be understood only by interpreting them in terms of epistemic perspectives (see Table 1). The previous paragraph explained that the work of Brown (2009) contributed to shed light on how the neo-positivist approach is mainly connected with the monologic form of accountability, and on how the socio-constructionist approach is mainly related with the dialogic form. Herein is showed how the co-accountability framework develops in connection with PNS epistemology.

To explore co-accountability in detail, Table 3 introduces the co-accountability variables and how each variable (from 4.1 to 4.4) is influenced by the core elements of PNS (Funtowicz and Ravetz, 1994). In this analysis, variables D and E are explored jointly in the understanding that both process and standards delineate the answer to “how does the co-production of co-accountability occur? Additionally, it makes an exploration of possible challenges in the implementation of co-accountability (4.5).

Table 3: The link between PNS core elements and co-accountability questions

<table>
<thead>
<tr>
<th>Co-accountability (questions, challenges and solutions)</th>
<th>PNS core elements (and its application to co-accountability)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.1 Who are the power-account holders? (AB)</strong></td>
<td><strong>(1) The plurality of perspectives and commitments</strong></td>
</tr>
<tr>
<td></td>
<td>Power-account holders with different, sometimes competing, set of values and priorities.</td>
</tr>
<tr>
<td></td>
<td>.AB is subject to changes. The group of relevant stakeholders can change over time.</td>
</tr>
<tr>
<td></td>
<td>.AB share the whole process from co-selection of indicators to redefinition of strategies in the long term.</td>
</tr>
<tr>
<td><strong>4.2 What they have to account for? (C)</strong></td>
<td><strong>(2) The scientific management of uncertainty and of quality</strong></td>
</tr>
<tr>
<td></td>
<td>Indicators are co-selected considering multiple and sometimes competing values and priorities.</td>
</tr>
<tr>
<td></td>
<td>Indicators go beyond quantitative indicators and are focused on values-ethics commitments (mission/goals).</td>
</tr>
<tr>
<td></td>
<td>Indicators need to describe and assess how problem-solving activities are performing.</td>
</tr>
<tr>
<td><strong>4.3 What process and standards need co-accountability to follow? (D and E)</strong></td>
<td><strong>(3) The intellectual and social structures that reflect problem-solving activities</strong></td>
</tr>
<tr>
<td></td>
<td>The overall process of co-accountability is shared among stakeholders. They have to co-define both process and standards.</td>
</tr>
<tr>
<td></td>
<td>The process is ongoing and dynamic. It evolves due to uncertainty and changes. Standards need to be adjusted and customized in order to ensure a smooth process.</td>
</tr>
<tr>
<td></td>
<td>The process and standards aim to become a problem-solving toolkit.</td>
</tr>
<tr>
<td><strong>4.4 Which effects/consequences produce a breach of these standards? (F)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In case of a breach of standards, responsibility and rights are shared. Individual and collective responsibility co-exist and complement</td>
</tr>
<tr>
<td></td>
<td>There is an ongoing evaluation focused in the long-term effects and consequences.</td>
</tr>
<tr>
<td></td>
<td>The assessment of the breach becomes a guidance for reshaping strategies or standards in the long term.</td>
</tr>
</tbody>
</table>
4.5 Possible challenges in the operationalization of co-accountability

| each other | Key issues and difficulties in stakeholder engagement and dialogue. | Key issues in managing a changing and dynamic framework of co-accountability. | Key issues of stakeholder engagement in an ever-changing environmental that remains focused in problem-solving. |

4.1 From power-holder and account-holder to power-account holders

The first and second questions of the traditional accountability model (Mashaw, 2006; Rached, 2016) regarding who is accountable to whom, become unified in the co-accountability framework. Indeed, under the co-accountability perspective all stakeholders become gradually both account and power holders. The redefinition of A and B (and the relationship in between) under a PNS epistemology would mean that not only A accounts to B but also the other way around. In other words, A and B become a single AB variable that represents all involved (engaged) stakeholders in co-accountability. In AB multiple stakeholders share rights and responsibilities, and ideally have a balanced distribution of power to exercise them. This plurality of perspectives improves the relationship between quantity and quality of information because the interaction among different stakeholders expands each individual’s potential for social understanding and action and allows them to access to more information about partners’ behaviour (Gallotti and Frith, 2013).

Moreover, AB, is influenced also by the second PNS core principle related to the management of uncertainty and of quality. Attending to this principle, AB is subject to modifications and thus, can change over time. Under these conditions, complexity and uncertainty are central to the co-accountability framework and they represent the focal point for bringing different stakeholders (experts and non-experts, see also Brown, 2009) into the co-production of knowledge (Frame and Brown, 2008). According to co-accountability framework, uncertainty does not function as a source of unwelcome tension between different stakeholders and perspectives; rather it becomes a primary component of the process in order to interpret and manage messiness (Frame and Brown, 2008; Gold and Sugden, 2007).

Finally, the AB power-account holder is also consistent with the third core element of PNS regarding the intellectual and social structures that reflect problem-solving activities. Indeed, the co-accountability framework recognizes and respects that every stakeholder has a relevant contribution to the solution. Considering multiple perspectives is not merely a moral and/or ethical exercise of justice (O’Connor, 1999; Gluckman, 1972) but also a recognition that multiple perspectives contribute to understand better the problem and, therefore, to find faster and more effective solutions. In other words, the recognition and respect of every stakeholder’s knowledge, provides a relevant contribution to the solution (Frame and Brown, 2008). Furthermore, from a pragmatic point of view, AB stakeholders are co-responsible of the whole process of co-accountability. Not only in the definition of metrics, but also in its following measurement (therefore in collecting together data and estimating measurement) and along the overall continuous process or assessment and redefinition of strategies in the long term (Schlenker et al., 1994).

4.2 From standardized financial information to customized qualitative and quantitative assessment indicators

The C variable of the co-accountability frameworks relates to the different dimensions (for what?) the AB power-account holder need to agree upon the definition of assessment information. In the co-accountability framework, the variable C represents assessment dimensions and indicators that are
relevant for all engaged stakeholders.

By considering the first core element of PNS, the plurality of perspectives and commitments C is co-specified by AB as a set of customized qualitative and quantitative set of indicators. Given that there is not one single stakeholder perspective it is not possible to offer one single metric able to reply to all possible stakeholders’ demands (Costa and Pesci, 2016). Therefore, in co-accountability performance dimensions, aspects to be assessed and indicators are co-selected (Jasanoff, 2003), thus customized for each organization and group of engaged stakeholders.

In addition, C, is influenced also by the second PNS core principle related to the management of uncertainty and of quality. Similarly, to the dialogic accountability framework, co-accountability neglects and refutes the focus on monetary information (Brown, 2009) and it considers a broader and holist perspective. By following a PNS epistemic view, the co-accountability framework considers that although quantitative and financial indicators may provide useful information about economic performance, co-accountability offers information that can go beyond to financial measures and quantitative arguments (Brown, 2009; Bebbington et al, 2007; Larrinaga and Bebbington 2014; Costa and Pesci, 2016). Instead, indicators focus on measuring the accomplishment of AB’s specified priorities. Additionally, the set of indicators is not static but subject to change across time.

Finally, by addressing the third PNS core element, the customized qualitative and quantitative indicators need to be problem-solving oriented and, offer a clear view on the performance towards the solution, therefore it aims to transform the set of dimensions and indicators into a powerful learning tool.

4.3 The co-production of co-accountability: process and standards

The fourth question of the traditional accountability model (see Mashaw, 2006 and Rached, 2016) regarding what process need accountability to follow and the fifth question regarding by what standards correspondingly, are presented together in this section because in this framework the process and the standards are seen as the answer to the question: how does the co-production of accountability occur?

In order to carry the process, the paper introduces the concept of a ‘focal organization’ – which is the organization, or group of stakeholders that need to activate the whole co-accountability process. In this sense, the focal organization act as a leader, not in the hierarchical sense of authority but in strategic sense of being responsible to start and coordinate the process of co-accountability. More in detail, a focal organization starts specifying variable AB with the identification and categorization of stakeholders. Subsequently, selected AB stakeholders specify together its interests, main dimensions of performance, aspects to be measured and relevant indicators, thus variable C. Afterwards, AB stakeholders co-define the process and standards to be followed, thus variable D and E. Finally, F is specified with the co-selection of consequences originated by a breach in the standards.

Regarding variable D, co-accountability does not represent a linear process but instead variables are specified as part of a chain that forms a loop in which each variable is fed and feeds back into each other. The impact of one variable into another indirectly influences the ongoing process of co-accountability. For example, AB influences the specification of C but, C also influences the specification of AB. More in detail, the specification of C influences the ongoing process of co-accountability because depending on which dimensions and metrics are selected different stakeholders will be more or less relevant. In order to ensure the representation of stakeholders in all dimensions, changing dimensions could change the specification of AB. This means that the co-accountability process implies the interaction and interdependence of variables.

Along the same lines, standards of co-accountability (variable E) are co-created. Although the focal organization might take well known standards and guidelines (such as GRI, AA1000SES, ISO) as a
basis of discussion and learning, nevertheless each organization keeps the right to customize and create their standards in order to ensure the achievement of their mission.

By reading this D and E variables through the three core elements of, co-accountability framework advocates a co-definition and co-production by all AB engaged stakeholders. In order to make different individuals or stakeholders to act collectively, it is necessary that collective intentions are the product of a distinctive mode of practical reasoning, team reasoning, in which agency is attributed not only to A or B, but to AB as a unique agent (Gold and Sudgen, 2007). This is consistent with a co-accountability framework.

Although the specification of variables can change over time, by applying the PNS epistemology and the ‘management of uncertainty and of quality’ principle, the process and standards have to define clear boundaries of co-accountability for a specific moment and priority problems to be solved, such as: who are the engaged stakeholders, which indicators are relevant and which are the consequences in case of non-compliance for a specific time and scenario.

By applying the third core element of PNS, the intellectual and social structures that reflect problem-solving activities, both D and E become a toolkit for the practical application of co-accountability. The solution of complex problems requires a seamless process of engagement of those who are affected by and who affect a certain issue (Bebbington and Larrinaga, 2014). This continuity in the process of participation not only will allow the strategic toolkit to adjust changes over time but also it will allow stakeholders to acquire experience that will help them to improve their interaction and cooperation skills with each other (Gold and Sudgen, 2007).

4.4 The co-responsibility of co-accountability

Variable F offers a clear view on a system of shared rights and responsibilities on an individual and collective level that offers guidance in reshaping long-term strategies (Andreoni et al., 2003; Schlenker et al., 1994).

By considering the first core element of PNS, the plurality of perspectives and commitments, F considers essentially an ethical commitment and responsibility not only in the process of disclosing accountability but also in the use or abuse of power enacted by the process. Therefore, it is based on reciprocity, there is tolerance of tensions and admission of possible antagonisms, but overall there is a desire of coexistence beyond self-interest (O’Connor, 1999). Therefore, it exists a responsibility from power-account holders for the consequences of their actions. AB stakeholders share the rights and responsibilities, and both collective and individual responsibilities operate simultaneously (Gluckman, 1972).

Moreover, F does not exclude or substitute individual responsibility but complements it (Schlenker et al., 1994), consistently with the management of uncertainty and of quality. In the proposed co-accountability framework, collective power and individual power should be complemented. As such, F represents simultaneously an evaluation tool and a strategic redefinition enabler at a dual level of individual stakeholders and stakeholder network. In this sense, the co-accountability framework should be helpful to guide the redefinition of individual strategies (each stakeholder) and multiple strategies (stakeholder network) towards the achievement of their goals and missions.

Finally, in order to be consistent with the third principle of PNS epistemology – i.e. the intellectual and social structures that reflect problem-solving activities – F has to put in place not only a mechanism of (i) evaluation performance but also of (ii) evaluation of strategy with a focus in both cases to individual and collective perspectives simultaneously. In the case of evaluation of performance, F is related with the assessment of co-selected dimensions and performance indicators. In other words, AB not only selects and provides information to estimate C but, ultimately, has the co-responsibility of making a self-evaluation of performance, both at individual and collective level.
In the case of evaluation of strategy, $F$ aims to go one step forward towards the related consequence of a breach of the D&E variable. Considering that all stakeholders specified in AB are subject to consequences accordingly to the performance evaluation makes co-accountability a powerful tool for redefining strategies in the long run. Co-accountability proposes to transform a system of rewards and punishment (Andreoni et al, 2003) into a specific variable ($F$) that evaluates and redefine AB strategies at a dual level: (i) co-strategy of the group of stakeholders as a whole and (ii) individual strategies of each stakeholder to modify its attitude toward the AB power and account-holders for the sake of the broader co-accountability interest.

4.5 Possible challenges in the operationalization of co-accountability

The most pressing challenges in the implementation of co-accountability are interrelated with each and all of the core elements of PNS (see Table 3). Despite, being presented separated per core element, nevertheless, all these challenges are interconnected and interrelate with one with another, therefore in this paragraph we are going to present the possible challenges of core element of PNS in the co-accountability framework.

Each accountability variable is transformed by applying the *plurality of perspectives and commitments*. The most relevant challenges in operationalizing a shared framework of accountability are related with key issues and difficulties in engaging stakeholders and achieve a meaningful and effective dialogue. According to Unerman (2007) the first key issues in engaging stakeholder and achieve a meaningful and effective dialogue is *identifying the range of stakeholders to be considered*. The identification of stakeholders will depend on the focal organization’s motives for engaging in co-accountability. More in detail, this refers to the proper and timely identification of AB stakeholders. Although, the identification of stakeholders can change over time, however it is important to start with the right stakeholders in order to ensure the success of the rest of the process. In addition, Unerman (2007) addressed the problem of the *impossibility of direct dialogue and engagement with some stakeholders*. Indeed, involving all identified as relevant stakeholders might not be possible in certain circumstances. In example: defending environmental issues always require to use a certain environmental organization as representative (proxy) of the environment’s priorities. As a consequence, it is crucial to engage with previously identified AB stakeholders or in the worst case scenario find the right stakeholder able to act as a proxy of their interests. The right identification and engagement is essential to delineate and co-select the proper dimensions, set of indicators, process, standards and consequences of co-accountability. The last issue discussed by Unerman (20017) concerns *addressing heterogeneous stakeholder’s views and expectations*. The views and expectations within stakeholders might be competing and at times even mutually exclusive. In this case, it is important to put mechanisms in place to ensure a fair negotiation between involved parties. Consensus is needed through all the process of co-accountability and definition of each variable, therefore it is desirable to promote a democratic debate.

Furthermore, each accountability variable is transformed by applying the *scientific management of uncertainty and of quality*. This core element of PNS transforms co-accountability in an ever-changing framework. The key issues regarding this core element is to find the proper balance between flexibility and clarity in the process. Although the process of the co-accountability framework must be dynamic because acknowledges an ever-changing environment, nevertheless, the process has to define clear boundaries of co-accountability for a specific moment and a set of priority problems to be solved. More in detail, who are the engaged stakeholders, which indicators are relevant and which are the consequences in case of non-compliance for a specific time and scenario need to be clearly defined and detailed at a certain point. If co-accountability boundaries remain unclear, it is not possible to distinguish who are engaged stakeholders, for what, and subject to which consequences. Regarding managing quality, co-accountability is not only about a participatory and inclusive process but equally important about of quality of decision-making process.
Finally, each variable is transformed by applying the intellectual and social structures that reflect problem-solving activities. This core element of PNS posits co-accountability in a problem-solving framework. The challenges of this core element encompass both to make the problem-solving participatory and high quality, thus effective. In summary, co-accountability will face the key three big challenges related with its core elements: (i) issues of engaging multiple stakeholders, (ii) issues of managing a changing and dynamic framework and, (iii) the challenge of remaining focused on problem-solving activities.

5- Conclusions

This paper has explored at a theoretical level the importance of different epistemological approaches in shaping the notions of accountability. A review of the literature suggests that neo-positive and socio-constructive epistemic approaches coexist in accounting and accountability for satisfying different knowledge needs. These epistemologies are presented as non-conflicting, but on the contrary useful for different purposes depending on the cognitive needs that they have to satisfy.

The paper differs from previous research contending that PNS is different when compared to social-constructionism not only in terms of paradigms, but also in terms of ontology because it does not aim to reach an institutionalized reality, but it negotiates flexible solutions for contingent problems by involving stakeholders in the debate. This different ontology determines accounting and accountability features when placed under the PNS domain, and it shapes them as sciences useful to solve specific issues.

At a more pragmatic level, the paper has explored the development of a new accountability framework: “co-accountability”. More in detail, co-accountability finds new answers to the traditional accountability questions through the lenses of the three core elements of PNS. It attempts to translate the answers found in a practical indication for implementing accountability in dynamic environments. In being PNS epistemology oriented to practical knowledge instead of to reach “the” knowledge, the co-accountability framework needs to have powerful implications in practical terms.

The co-accountability approach is particularly worth of exploration because it is an effective quality control tool in a changing dynamic environment (the scientific management of uncertainty and of quality) that leads to the most effective finding of the solution (the intellectual and social structures that reflect problem-solving activities).

Indeed, the practical novelty of co-accountability lies in its fulfilment of all the accountability questions developed on the literature. In detail, regarding the accountability issue: “accountability from who to whom?” Co-accountability blends the traditionally separated roles of account-holder and power-holder into one role of account-power-holders and accepts that relevant stakeholders can change across time. This is consistent with a pluralistic view of PNS in order to build an account-power holder collective intention. Second, regarding “accountability for what?” The co-accountability framework proposes a co-selection and co-production of both quantitative and qualitative information. Co-accountability not only refutes a monetary reductionist approach and it encourages a holistic view of economic, financial, social, cultural performance indicators but additionally, the co-selected indicators need to describe how problem-solving activities are performing. Third, regarding “accountability how?” the co-accountability framework suggests that the process of information generation is dynamic and ongoing, given that in real contexts conditions, multi-stakeholders and issues to be solved change constantly. More in detail, the proposed framework suggests a circular process of dynamic variables that are fed and feedback into each other in an
ongoing process and the entire process is constantly aimed to find solutions. Standards to guide the process are equally co-created, customized and not merely based in pre-accepted solutions.

Fourth, the novelty of the co-accountability framework is evident in its fulfilment of previous accountability frameworks by developing an answer to: “accountability under which consequences?”. In this regard, by applying a PNS epistemic view, co-accountability argues that although rights and responsibilities are shared among the account-power holder, this does not imply the disappearance of individual rights and responsibilities but on the contrary the need of complementing each other in the most collective way. In order to consider both these dimensions, co-accountability suggests perform evaluation and strategy redefinition on a dual level of (i) individual performance and strategy redefinition and, (ii) collective performance and strategy redefinition.

To sum up, the co-accountability framework proposed in this paper is thought to have deep practical implications and to be used as a road map for focal organizations in contexts in which accountability needs to produce useful knowledge deriving by a process of negotiation of interests and information. This is consistent with PNS epistemic view, which is not aimed at identify or reach an institutionalized reality, but it supports the idea of negotiate different flexible solutions which can be developed in different context. Given the fact that traditionally unheard actors might have a crucial piece of information essential for an effective decision making and a fast understanding and finding of the solution. As a consequence, co-accountability actively engages and empowers stakeholder not only because is morally fair (plurality of perspectives and commitments) but also because is an effective quality control tool in a changing environment (the scientific management of uncertainty and of quality) that leads to the most effective finding of the solution (the intellectual and social structures that reflect problem-solving activities).

Co-accountability it is posit under PNS umbrella because it promotes an ever evolving paradigm in which methods and theories are constantly negotiated and re-shaped; and, in which the ontological problem it is no more a key issue.

In order to extend this paper, the authors are aware that other epistemic approaches could be studied, developed and applied in practice. Furthermore, and exhaustive review of challenges and possible solutions in the operationalization of co-accountability based on a real experience could prove insightful.

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