

Leadership in Research

Transformational Leadership and Commitment to Concepts in Knowledge Creation

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ABSTRACT

While the autonomy of research professionals is considered a crucial condition for the quality of their findings, leadership of research is also seen necessary for the efficiency and quality of research work in research teams. Leadership may be effective in terms of knowledge creation, but this area is poorly understood. This article analyses the nature of commitment to concepts as part of the effect of transformational leadership on research work within a group. The conclusion is that leadership is an integral part of knowledge creation, not just of knowledge sharing and exploitation. Effective leadership results in the mixture of epistemic and social commitments that makes a group a collective knower, not just a sum of individual knowers. The analysis of conceptual commitments contributes to understanding the rejectionist/believer debate of social epistemology in a new light.

1 INTRODUCTION

Leadership is often expected to play a major role in knowledge-intensive companies. While it has become a commonplace to claim that leadership is more important in knowledge creation, sharing, and exploitation than management, the nature of this claim is seldom analysed in the context of

research management of research organizations. As universities, for example, are nowadays expected to be effectively managed by introducing research programmes and critical mass to create a competitive profile in the global knowledge economy, the requirements of knowledge management emanating from the nature of scientific knowledge creation in research are often overlooked.

The autonomy of research professionals is considered a crucial condition for the quality of new knowledge they create. At the same time, mere individual efforts are not seen as sufficient for innovativeness, social interconnectedness being understood to enhance the quality of research. Interaction within research groups or teams, virtual networks and communities crossing disciplinary, institutional and national boundaries is often expected as well as encouraged and even managed with great care. The career of the researcher or scientist means working in changing social settings affecting the development of his or her research orientation. Social dependencies have become stronger as new knowledge is constructed on the basis of voluminous knowledge produced by many other researchers and as research funding is more often temporary and project-based, implying constant dependence on changing funding policies and markets. Research projects have leaders who are formally responsible for the implementation of the research plan and who organize and reward research work. In addition to formal leaders (managers), informal academic leadership may

occur in many different forms in all social settings related to research work. Leadership of individual researchers and their groups definitely exists, but the interesting thing is what this means in terms of knowledge creation.

Given the social intensity of knowledge creation, research on social epistemology (such as Corlett 2007, Mathiesen 2007) has focused on the question of social groups as epistemic agents. While the standing assumption of analytic epistemology has been that knowledge is justified true belief known by an individual, new research has raised the possibility of understanding social collectives as knowers. A number of authors contend that what a group knows or believes is not merely shorthand for what each member of the group knows summatively. Wray (2001, 2007) argues that we have to enlarge the traditional conception of knowledge. There are instances where a group adopts a view that is not reducible to the views of the constituent members: a committee may determine that a particular job applicant is superior to other applicants despite the fact that no individual member of the committee believes that the applicant chosen is the superior candidate. Active discussion on whether groups believe or merely accept propositions has resulted in the "rejectionist/believer" debate. To the extent that groups and not only individuals know, leadership in research may have a more crucial role in creating new knowledge than we have traditionally thought. However, leadership and other group processes have not been paid sufficient attention in social epistemology. As knowledge is understood as justified true belief, leadership is probably closely related to justification and belief, which are now understood as social phenomena. It is not only independent individuals who justify beliefs to the extent that they as individuals believe their research output is true (or valid) or closer to the truth (or more valid) than some alternative beliefs.

Concepts are the *sine qua non* of knowledge creation, sharing and exploitation. Scholarly communication requires common or close to common concepts. Believing in the value of a certain concept is normally socially influenced, but, in the context of a research project, the common interpretation of the concept is a condition for collaboration in many phases of the research enterprise. Leadership processes, sometimes with a variety of informal leaders, emerge to ensure that the members of the research team have a similar understanding of

the key concepts of the research design. Not all members may believe in them with equal conviction. Leadership processes may give space to criticism and doubt, but at some point the team has to have sufficient belief to be epistemically motivated to accomplish the project plan, perhaps in a modified form. The existence of this belief is different from the sum of the beliefs of the team members, if the summative approach to groups as knowers is at least partly inappropriate.

The belief in the usefulness or correctness of the key concepts must have more than a momentary existence, as the accomplishment of the project takes time. Although the strength of the belief may vary during the project, a commitment to a particular interpretation of a set of key concepts is needed to complete the project. In this way, we can talk about commitment to concepts affected by leadership processes operating within a research team.

The transformational leadership introduced by Burns (1978) and developed further by Bass (1985) and his associates (Bass & Avolio 1994, Bass & Riggio 2006) is often seen as a promising approach to attempts to understand the role of leadership in knowledge management. Transformational leadership, as it is commonly understood, is close to charismatic leadership (Bryman 1992, House 1977). Transformational leaders are seen as effective in four important respects: charisma, inspiration, intellectual stimulation, and individualized consideration. In this study, these characteristics are analysed in the context of creating new concepts and questioning old ones. Transactional leadership approximating to economic exchange is contrasted with transformational leadership to see the difference between the two. Leadership is understood as processes of creating opportunities for conceptual discoveries and introducing social structures for strengthening and weakening the commitment of researchers to emerging and dying concepts.

In the following, research on commitment (Virtanen 2000) is utilized as a means of understanding the loci, objects, foci, and bases of commitment relevant for understanding the role of leadership in creating and applying concepts in research. Leadership in research is understood as management of conceptual commitments within the context of a research project working in the form of one of more research teams. The research question of the article is: *how can we understand*

a commitment to a key concept in research work, if it is seen as an effect of transformational leadership?

The study is a literature review aiming at a conceptual model for future empirical research. Such research is expected to be important for research-oriented and professional organizations in both the public and private sectors. The coherence of organizational work is based on a commitment to common key concepts, because researchers and other professionals have autonomy in their work. Coherence is not based on controlling behaviours but on maintaining the balance between supporting and questioning attitudes as to the values and goals of the organization.

2 COMMITMENT TO CONCEPTS – A GENERAL FRAMEWORK

The general approach to commitment applied in this article is outlined in Table 1 (see also Virtanen 2000). Commitments have sources, antecedents, loci, objects (ideas and actors), bases, foci, and consequences that again (partly) constitute the sources. Sources describe the macrocosmic (societal) and mesocosmic (institutional) contexts of conceptual commitments (i.e., commitments to concepts) in a research field. These contexts provide the environment in which the commitments of individual researchers to different conceptual structures of epistemic activities evolve. For example, the generality and credibility of gender as a scientific concept varies at the societal level by civilization and the longevity and effectiveness of national gender equality regulations and policies. All these affect the practices of upbringing and education and general socialization of individuals. At the institutional level, commitment to gender as a credible concept varies with discipline, school of thought within a discipline, and research institution (universities vs. other institutions).

Antecedents are modifiers of the conceptual commitments of researchers, not their causes. They are attributes of researchers, mostly related to institutional, organizational and group levels. Age and sex may modify commitment to the concept of gender as well as to many other concepts. Job description or role in research work is related to the phase of the research career and the degree of autonomy in research work (for example, research assistant, PhD student, junior researcher, senior

researcher, researcher in charge), all affecting the nature of conceptual commitments.

In my organizational commitment framework (Virtanen 2000), the locus classifies the objects of commitments into two groups: (1) ideas: values, concepts, theories, methodologies, policies, ideologies, etc.; and (2) actors: researchers, leaders, teams, organizations, professions, networks, etc. These are potential objects of commitment. In the social world, ideas exist through their carriers, the actors. Some actors share some ideas, but actors always have somewhat disparate ideas. Consequently, as individuals are committed to ideas, there is always a potential commitment to those with those ideas, latent actors not always known to particular individuals. This is based on the social nature of commitment. Ideas and those who espouse them have fuzzy correlations.

Before going on to the elements of commitment, we have to distinguish between personal commitment and social commitment. Personal commitment is not open to others. One may behave such that nobody knows about a personal commitment (for example, a silent prayer without folding one's hands together before a meal). Social commitment is public at least in the sense that consistency and inconsistency of behaviour is an indication of commitment as others may perceive it (for example, an overt promise to stop smoking but continuing smoking). Becker's (1960) conception of commitment as "consistent human behavior" includes examples implying the existence of a social relation. He argues that there are generalized cultural expectations (like not to changing one's job too often) that provide penalties for those who violate them (someone who does is erratic and untrustworthy). Sometimes impersonal bureaucratic arrangements make the side bet: benefits from an organization's pension fund are lost if one leaves the organization. Side bets are also made by the social process of face-to-face interaction, where a person first claims to be a certain kind of person and then finds it necessary to act in an appropriate way to "save face". In this way, commitments are not necessarily made consciously. Becker calls these commitments by default. For example, accepting membership of an organization brings with it many commitments, the existence of which is recognized only later. In the context of this article, joining a research team may bring with it commitments related to ways of doing and thinking about research that reveal themselves only later.

Table 1. Mapping Determinants of Commitments in Research – Preliminary Outline of Actor's Perspective.

Source – partly effects of consequences	Antecedent – Modifier	Locus	Object	Base	Focus – Framework	Consequence – the degree of
Upbringing Class Education Institution Training Leadership Disciplinary culture Academic culture Political culture National culture Regional culture Civilization	Age, Sex, Ability Talent Tenure, Salary Task Autonomy Job Scope Formal authority Stakeholder membership Nature of employing research organization: public, private, quango	Idea	Concept Methodology Theory Value Goal Principle Ideology Artefact (profession, intellectual style, myth, hero, etc.)	Obligation Utility Emotion	Epistemic Moral Legal Economic Administrative Political Aesthetic	Research quality Turnover Job performance Sacrifice Effort Grievances Solidarity Loyalty Cohesion
		Actor	Eminent scholar Colleague Leader Unit, Team Organization Research network			Consensus Reputation Responsibility Accountability Effectiveness Publicity Legitimacy

What is the role of behaviour in relation to commitment to ideas; for example, to the concept of gender in doing research as a member of a feminist research team? In some respects, there is a commitment to the concept, if one thinks consistently with it, although there are various internal incentives to relent and choose another concept. But is it a commitment if one never behaves in accordance with the concept while actually doing research: for example, in debating and writing research reports? Can commitments exist in contemplation without ever emerging in the form of debates or any other overt behaviour? Is it wrong to say that you may do what people want you to do but continue to maintain your own commitments? It seems that we use the term commitment to claim that one's behaviour is in accordance with one's thoughts. Although overt behaviour does not necessarily show all about one's conceptual commitments, behaviour is understood as a proof of commitment. There is no such thing as commitment without behaviour, a conception shared by many authors (Kiesler and Sakumura 1966, Mowday et al. 1979, Salancik 1982).

Given the structure of the framework, commitment to a concept is certainly commitment to an idea. When the intensity of social relations is taken into account, however, commitment to a concept may depend on commitment to an actor, since the salience of a concept may be more or less directly related to the salience of an actor, for example, a renowned scholar. The extent to which the commitment to a concept is a mixture of commitments to ideas and their carriers (other researchers and their networks) and the ways in which this commitment is created, strengthened and modified are fundamental to leadership processes among researchers. The effectiveness of leadership may need the mutual signification of an idea and an actor; for example, the right interpretation of gender in 'our research team' is what professor N.N. thinks about it and vice versa. The signification may be understood as a pragmatic tool for leadership to create individual acceptance of the concept but, as the signification may result in believing the value of the concept without transparent reasoning, the nature of commitment may turn out to be something other than the result of a series of logical steps in scientific inference. The interrelatedness of ideas and actors points to different ways of understanding commitment to a concept. For example, is a group's commitment to a concept

different from an individual's commitment to a concept in the same ways as a group as a knower is different from an individual as a knower?

Essential to understanding the nature of commitment to a concept is how we understand the distinction between the base and the focus of commitment. In research into organizational commitment, it is commonplace to differentiate between normative, continuance and affective commitment (Allen & Meyer 1990). Meyer and Allen's (1997, 11) definition of the three types of organizational commitment is widely used:

Affective commitment refers to the employee's emotional attachment to, identification with, and involvement in the organization. Employees with a strong affective commitment continue employment with the organization because they *want* to do so. Continuance commitment refers to an awareness of the costs associated with leaving the organization. Employees whose primary link to the organization is based on continuance commitment remain because they *need* to do so. Finally, normative commitment reflects a feeling of obligation to continue employment. Employees with a high level of normative commitment feel that they *ought* to remain within the organization.

Foci of commitment are understood as individuals and groups to whom an employee is attached, and bases of commitment are motives engendering attachment; for example, compliance, identification and internalization (Becker 1992). This leads to the idea of multiple commitments. A more coherent way to put this is to talk about obligation, utility and emotion as bases of commitment and make a distinction between different foci of commitment (moral, economic, political etc.) and objects of commitment (leader, team, organization; value, ideology, policy etc.) (Virtanen 2000). For each object of commitment (e.g., a leader), there are several foci of commitment, and for each focus (e.g., political), there are at least three bases of commitment: emotion, utility, and obligation. All commitments, irrespective of their object, foci, and bases, may be more or less manifest (transparent) or latent depending on the social mechanisms producing commitments. Questions of internalization, identification, involvement, attachment, social pressure, power, socialization, etc., are related to the characteristics of these mechanisms. Leadership is understood here as a social mechanism creating a variety of commitments.

Perhaps the most interesting part of the

mapping of the elements of commitment is the base and focus of commitment. Bases and foci cannot be treated separately, as together they form the *motives for commitment*. For example, a moral (focus) motive of commitment may be based on obligation (deontological norms) and emotion (it 'feels right') as well as on utility under a utilitarian theory of morality. In general, moral motives are related to obligations, rights, and virtues, most of which have something to do with sacrifices, freedom, and the good life (Taylor 1967). The moral motive of commitment to a concept of gender in doing research, as an example, may look strange. The standard way to understand the choice to apply the concept of gender is the need to know more about X (e.g., performance pay) in the gender perspective, explain X better, assess the pros and cons of X for men and women, etc. One could call these motives epistemic, but, as we are now interested in commitments which are inherently social, the need for more research should be understood as a promise or conviction declared in a social setting with their ensuing behaviours to be understood as research activities that other people can observe. This is to say that epistemic motives for research can be part of social acts leading to commitments.

In this context, moral commitment to a concept means that, for example, it is fair to do the kind of research one has implied when joining the research team. One could say that this is the same as commitment to the team, but this may involve multiple commitments, some of which are ideas. Different team members may be committed to different ideas, also espoused by researchers outside the group. In general, researchers are networked with many actors, of whom only some are members of the research team. Consequently, the nature of commitments is understood better if all relevant objects of commitment are included.

The economic motive of commitment is probably mostly based on utility, but mutual promises given in contracts also create obligations (to pay, for example). Examples of economic emotions are greed and envy. An economic motive for commitment to a concept might be based on utility if there are good chances of getting funding for the type of research the concept refers to (e.g., gender studies of leadership). When based on envy of the reputation or funding of other research teams, the commitment may be an aspect of scholarly competition between research institutions.

Political motives for commitment are related to gaining and obeying power. Political obligation as the base of commitment may be a calling to lead other people, but perhaps more often it is related to justification of power in that some people have the right to expect the obedience of others. Political utility can be understood as political gains in some power play; for example, in coalition formation. Emotional bases for political commitment include lust for power, a sense of belonging, hatred of political opposition, admiration of charismatic leaders, fondness, and the flush of victory. Political commitment to a concept (of gender) employed in scientific research, is most obviously present if the research aims at changing society (empowering women). If the research program of the team is composed 'democratically' with a majority (and not completely consensually) and in a way that ensures the adaption of a particular interpretation of core concepts and not others, the researchers may see the commitment to this interpretation as their political obligation. A member of the majority may experience a flush of victory when their interpretation becomes the principle of the forthcoming research.

As for the commitment to concepts, one could understand the focus as epistemic, something close to justification of beliefs. The classical Platonic definition of knowledge is justified true belief. If a knowledge claim 'X is p' is understood as part of factual social world where Q argues that 'X is p', Q is a person who claims to have justified that 'X is p' which is the reason why Q believes that 'X is p'. If the claim is factual, Q uses both empirical data and concepts in the justification, as no empirical statement is independent of conceptual thinking. If the statement is conceptual, Q uses concepts and their logical interrelations in the justification. In both justifications, Q employs concepts. Concept A may be better than concept B in the justification of knowledge claims. The comparison of the epistemic utilities of concepts A and B is itself a justification process based on other concepts. Epistemic commitment to concept A can be understood as Q's justification of his or her belief that A is better than other concepts for a certain goal of knowledge formulation (i.e., claiming that 'X is p').

As commitment to a concept is social in the sense that commitments are social, a researcher Q's commitment to concept A has to be a public statement. Q may attempt to justify his or her

commitment to concept A to an audience by the benefits potentially accruing in knowledge formulation set as a goal for a research project R (i.e., by epistemic reasons). This kind of justification is communication from an individual to another or to a group of people, orally or in writing at the same time and place or virtually. Others may listen and simply take this as a declaration of a conceptual commitment. Others may also argue against this, which may result in an argument about the value of concept A in the knowledge formulation of R. Argument may change Q's justification of A's epistemic utilities, which may uphold the commitment to A or lead to withdrawal of the commitment. Both reactions should be made public in one way or other, because otherwise the criteria of commitment are not met. When Q is committed to concept A, his or her research behaviour should show this commitment such that this behaviour and its results are public. The commitment to concept A should be observable in scholarly discussion and research publications, for example.

Epistemic commitment to a concept is social, because commitment is social. The tricky question is the sense in which the *social* act of epistemic justification of a concept is also its justification morally, economically, politically, etc. Moral, economic, and political motives for commitment to a concept may emerge from a variety of epistemically justified concepts. In this way, it may be relevant to choose the one concept over the many – equally justified in epistemic terms – if the concept chosen is socially more valuable (for example, providing more funding). The choice creates a commitment to this concept. This commitment is external to the epistemic justification of the concept. However, it may be that the pool of concepts to choose from is not epistemically neutral, since Q may consider concept A better than B in epistemic terms. At the same time, moral, economic or political motives for commitment to B may be more justified than those for commitment to A. Both the easy and hard choice are relevant for leadership in the context of research teams.

As an object of commitment, a concept is an idea rather than an actor. However, in practice the objects may overlap. Where concept A is the conceptual commitment of, for example, an academic authority N, the question of the sense in which actor Q's commitment to concept A is his or her commitment to actor N arises. To the extent that Q is committed to N in the justification of the

epistemic utilities of concept A, the foci of commitment may be moral, economic, political, etc. Together with different bases of commitment – obligation, utility, emotion – the foci of commitment to a concept constitute moral, economic, and political motives of commitment to N. If Q trusts N better in the epistemic justification of concept A than his or her own reasoning, Q's epistemic justification of A is a mixture of epistemic and social reasoning. In this sense, Q's commitment exemplifies doubly social attachment to concept A, because epistemic justification is partly social, and the choice of A is made public, generating Q's commitment to A in the eyes of an audience. If N happens to be the leader of a research team, commitment to concept A is directly linked to leadership processes. As justification processes of epistemic value of concepts can be a *mixture of epistemic and social reasoning* resulting partly from leadership processes, attributing knowledge to groups or collectives as well, not only to individuals, is credible.

The consequences of conceptual commitments in research result in a variety of epistemic and social features of the research output and the research team. The quality of research is related to conceptual commitments, but these also have their effects at group and organizational levels as solidarity within the research team and job performance. More external factors related to conceptual commitments are reputation, publicity, and the societal effectiveness of the research team and its output. Conceptual commitments do not guarantee these effects and there is no direct causal chain from the grouping of multiple conceptual commitments to these factors, but conceptual commitments do have their place both in the process of mixing epistemic and social commitments that result in the organization of group processes and research output.

A Research Team's Conceptual Commitments – Believing or Accepting?

Traditionally individual justification and individual belief are considered necessary for knowledge creation, which attributes knowledge to individuals, not groups. If groups could believe and justify knowledge claims, they would be subjects of knowledge. The traditional definition of knowledge assumes that belief is based on rational justification. In this sense, belief and justification are inseparable. However, people can also believe claims for

irrational or arational reasons. For example, one may believe a knowledge claim because one's own processing of empirical data and rational comparison of competing hypotheses supports one hypothesis over another. As the data is often provisional, the belief is not absolute. There are doubts, but, given the results of rational analysis, one hypothesis is more acceptable than the other. This type of belief of a knowledge claim can be called *rational epistemic belief*. If one trusts another researcher's analysis, this trust may be rational; for example, based on a record of earlier analyses that one has personally checked. If the other researcher has proved to be trustworthy, one does not have to check all of his or her analysis again and again, but can trust him or her as a researcher, at least for time being. This type of belief in a knowledge claim can be called *rational social belief*.

On the other hand, one may believe a knowledge claim irrationally or arationally. If one's analysis of a claim is based on deficient data or inconsistent inference, known to one, but one still believes the claim, this belief can be called *irrational epistemic belief*. If the belief is not based on inconsistent inferences from conceptual and empirical analyses but, for example, on a dream that seemed very authentic, this belief can be called *arational epistemic belief*. When one's belief is based on another actor's claim, whose trustworthiness is questioned, for example, by collecting and comparing evidence of his or her previous success and failures but doing so in a shallow and provisional way, the belief can be called *irrational social belief*. When one's belief is based on believing another actor's claim, since the actor wants to love one, the belief can be called *arational social belief*. Irrational beliefs, whether epistemic or social, are based on reasoning, while arational beliefs, whether epistemic or social, are based on emotions. Arational beliefs may be called emotive beliefs.

Giere (2002) contends that even if individuals may not be able to produce knowledge alone, they can consciously come to know the final result in a completely ordinary sense. In this way, even the necessary division of labour in knowledge creation does not assume a collective as a knower. It is true that the result of the necessary division of labour can be known by an individual, at least if it is within the information processing capacities of an individual, but this does not prove that a collective cannot know.

Gilbert (1987) claims that collectives can have

beliefs. Wray (2001, 2007) contends that groups do not have beliefs. Wray agrees that groups can act as plural subjects and that they can act on intentions, but these intentions are more aptly described as instances of acceptance. Wray argues that as acceptance is based on reasoning, it can be acquired deliberately in order to advance goals. Because beliefs are acquired involuntarily, they cannot be acquired to advance goals. Wray (2007, 240) claims that belief is a feeling, "specifically a feeling that something is true", whereas acceptance involves no such feeling. However, Wray's argument does not hold if acceptance is understood as rational belief and if beliefs can be rational, irrational or arational. Beliefs may be partly involuntary, but acceptance may be too. Rational reasons for acceptance are not always compelling, and there may be more than one possibility to choose on more or less equally reasonable grounds. In addition, the choice may be based on emotions and be partly non-transparent, in which case there is room for involuntary belief. The strength of voluntary and involuntary beliefs may be affected by leadership.

An important element of a research team is the division of research labour, normally resulting from leadership processes. Wray (2007) argues that research teams may adopt views that are not identical to the views of the individual members of the group, because its members are organized to advance a goal. Research teams are based on Durkheimian organic solidarity, because team members are dependent on each other. In contrast, Wray argues, a community of scholars working on the same specialty share a mechanical solidarity. They are not organized in the sense research groups are. Wray argues that this distinction is the ground for claiming that knowledge can be attributed to research teams but not to scientific communities.

All this argument is plausible. One may continue that division of labour is an indication of various epistemic commitments based on a number of economic, administrative and political motives within the research team. These motives constitute the collective intention to create knowledge, rational beliefs that the team can justify together. As different members of the team may have somewhat different reasons for justifying the beliefs, the collective nature of the resulting knowledge depends on the similarity of reasoning and how the nature of similarity is understood (see Corlett 2007). However, it is the trust between

different actors that socially justifies the mixture of epistemic and social reasoning in the creation of epistemically justifiable research findings. When Wray (2007, 345) argues that to the extent research teams have knowledge, "what they have is justified true acceptance, rather than justified true belief", we might modify the argument to claim that the teams have knowledge to the extent they are committed to same epistemic principles of justifying beliefs. Acceptance in a research team with a goal of knowledge formulation is a rational commitment to a certain type of justification of beliefs, but this commitment always leaves room for arational commitment, the involuntary "colony" of belief. This distinction is partly the outcome of rational and arational aspects of leadership in a research team. Involuntary belief is part of the unintentional division of labour, and leadership is partly responsible for creating involuntary beliefs, as social relations are never entirely rational and transparent.

3 TRANSFORMATIONAL LEADERSHIP THEORY AS A THEORY OF COMMITMENT

Downton (1973) coined the term transformational leadership, in analysing the follower commitment in revolutionary movements. Commitment may be based on transaction, inspiration, or charisma. The critics (Thomas 1974) have contended that it is difficult to make the distinctions between the three sufficiently clear. Inspirational leadership is understood as convincing one's followers that there is "meaning" in revolutionary action and suffering. It may be difficult to see the difference from charisma, as inspirational leadership is related to seeing a leader as a representative of collective soul, or the communal identity of the group. The effectiveness of sharing a leader's "social philosophy" is, says Thomas (1974), based on grace: since the leader incarnates and personifies a transcendent vision with which followers identify through him. Followers must believe that the leader can succeed in his mission in spite of all obstacles, not just share the same opinion. Commitment based on transaction is understood as rational bargaining between the leader and the follower, where followers expect rewards for their service in proportion to their investment. According to Thomas, without the element of grace in such calculations no man could arrive at a rational equation that would justify his total commitment to personal leadership in the

pursuit of a transcendent mission. Wilkinson (1974) also has doubts about the view that a leader could legitimize him or her in the eyes of followers through the existence of tangible rewards.

The idea of transformational leadership was further developed by Burns (1978), who actually used the term *transforming* leadership, distinguishing between this and transactional leadership. Transactional leadership occurs when "one person takes the initiative in making contact with others for the purpose of an exchange of valued things" (Burns 1978, 19). By the contrast, transforming leadership "occurs when one or more persons engage with others in such a way that the leaders and followers raise one another to higher levels of motivation and morality" (ibid., 20). Their purposes, which might originally have been different, become fused. According to Burns, leaders and followers may be inseparable but they are not the same. The leader takes the initiative in making the leader-led connection and is more skilful in evaluating followers' motives, anticipating their responses and estimating their power bases than the reverse. Leaders "address themselves to followers' wants, needs, and other motivations, as well to their own, and thus they serve as an *independent force in changing the makeup of the followers' motive base through gratifying their motives*" (ibid., 20).

Burns deals with transforming leadership in the contexts of intellectual leadership, reform leadership, revolutionary leadership, and heroes and ideologies. The approach is largely historical analysis of society and social movements. His ideas about intellectual leadership at the societal level are not directly applicable to the analysis of the transformational leadership of research groups.

Transformational as well as charismatic theories of leadership emphasize values and emotions. Bass (1999, 11) summarizes the theory in the following way:

Transformational leadership refers to the leader moving the follower beyond immediate self-interests through idealized influence (charisma), inspiration, intellectual stimulation, or individualized consideration. It elevates the follower's level of maturity and ideals as well as concerns for achievement, self-actualization, and the well-being of others, the organization, and society. *Idealized influence* and *inspirational leadership* are displayed when the leader envisions a desirable future, articulates how it can be reached, sets an example to be followed, sets high standards of performance, and shows determination

and confidence. Followers want to identify with such leadership. *Intellectual stimulation* is displayed when the leader helps followers to become more innovative and creative. *Individualized consideration* is displayed when leaders pay attention to the developmental needs of followers and support and coach the development of their followers. The leaders delegate assignments as opportunities for growth.

According to Bass (1999), the transactional and transformational rubric can be applied to teams as a whole and to organizations as a whole. He contends that members of transformational teams care about each other, intellectually stimulate each other, inspire each other, and identify with the team's goals. Transformational teams are high-performing, says Bass, and organizational policies and practices can promote employee empowerment, creative flexibility and *esprit de corps*.

Bass is very clear about the usefulness of the theory. He claims that research has shown "how transformational leadership enhances commitment, involvement, loyalty, and performance of followers; how transactional leadership may induce more stress; how transformational leadership helps deal with stress among followers; and how contingencies in the environment, organization, task, goals, and relationships affect the utility of transactional and transformational leadership" (*ibid.*, 11–12). Transactional leadership can be reasonably satisfying and effective but transformational leadership adds substantially to the impact of transactional leadership.

Bass and Riggio (2006, 34–41) specify the role of commitment in the theory of transformational leadership, contending that components of transformational leadership can help build follower commitment in various ways. Idealized influence (wanting to emulate the leader or identify with the leader emotionally) is said to lead to identification with the goals, interests, and values of the leader. Inspirational motivation is used to build emotional commitment to a mission or goal. Leaders make followers consider the moral values involved in their duties as members of their unit, organization, and profession. Leaders further increase commitment by employing intellectual stimulation (e.g., problems are dealt with by joint efforts) and individual consideration (e.g., followers feel their career needs are met).

Bass and Riggio refine their claims by relating them to the theory of organizational commitment. The framework of organizational commitment

suggested by Allen and Mayer (1990) distinguishes affective commitment (emotional attachment to an organization), continuance commitment (anticipated costs of leaving the organization), and normative commitment (a sense of an obligation to stay). Penley and Gould (1988) identify moral, calculative and alienative commitment to organization. Bass and Riggio (2006, 38) connect affective and moral commitment together, skip alienative commitment (do not even mention it), contending that:

As one can imagine, transformational leadership should have its strongest influence on affective (or moral) commitment, with the other forms of commitment (continuance, normative, calculative) being more influenced by transactional leader behaviors.

There is some evidence in the empirical research of such dependencies, but, on the whole, Bass and Riggio do not analyse the nature of commitment any further. Their analysis does not cover the role of different elements of commitment (sources, antecedents, loci, bases, foci, and consequences) as integral parts of leadership behaviours related to idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Given these deficiencies, the effectiveness of transformational leadership in strengthening commitments is poorly understood.

The potential value of the theory of transformational leadership in understanding commitments results from the connections between the elements of commitment and leadership behaviour constitutive of transformational leadership. As the theory of transformational leadership is conceptually underdeveloped (see, for example, Yukl 1999 and Pawar 2003), the nature of leadership behaviour related to the four subdimensions of transformational leadership can be characterized mainly by the measures employed in the empirical studies. Most of the empirical research has employed some version of the Multifactor Leadership Questionnaire (MLQ). The original version included three components of transformational leadership: charismatic-inspirational, intellectually stimulating, and individually considerate. Research on the factor structure has shown that the charisma factor (subsequently called idealized influence) is separate from the inspiration factor (Bass & Riggio 2006, 20). The sample items of the current revised form are shown in Table 2. The full-range version of the questionnaire also includes the outcomes of leader-

ship: extra effort, effectiveness and satisfaction. Several authors have criticized the psychometric properties of the MLQ and some have developed their own measures (Hinkin & Tracey 1999, Podsakoff & MacKenzie 1994, Tejada et al. 2001, Yukl 1999). These add to the general idea of different dimensions but do not improve the theoretical clarity.

The items of the MLQ mirror the general dimensions of transformational leadership. As the content of dimensions is mostly inductive, based on factor analysis, the connections of items to the elements of the framework of commitment are not logically pure. However, we can find connections that make the dimensions of leadership more understandable in terms of commitments. In Table 2, the sample items are linked to the loci, object, bases, and foci of commitment. From the follower's point of view, it is quite easy to distinguish between actor and idea as the locus of commitment. The objects of commitment are also relatively easy to infer, but the bases and foci of commitment are more ambiguous. The importance of various bases and foci varies with the contexts of organizational leadership, but, given the general idea of the differences between transformational and transactional leadership, utility as a base and economic focus are largely related to dimensions of transactional leadership. Emotion and obligation as bases and moral focus are certainly something the proponents of the theory of transformational leadership keep referring to (see Bass & Steidlmeier 1999, Turner et al. 2002). However, the conceptual specifications of emotional and affective content and morality leave a lot of scope for refinement. Political focus may sometimes be a more appropriate background when emotions and obligations are seen as bases of commitments. On the whole, the nature of the sample items as measures of commitments needs more careful analysis than is possible to accomplish within this article. Given the nature of the sample items, it is obvious that better understanding of transformational leadership as a unique combination of commitments requires more theoretical analysis as well as more qualitative data analysis to attain sufficiently rich conceptual and empirical distinctions.

4 OPENING THE BLACK BOX OF LEADING CONCEPTUAL COMMITMENTS

Bryant (2003) has drafted a model of the role of transformational and transactional leadership in creating, sharing and exploiting organizational knowledge. Based on previous research, he claims that performance of managing knowledge at individual, group and organizational level may need different leadership styles in order to leverage knowledge into a comparative advantage. At the individual level, transformational leadership is effective in increasing creativity and innovation of individual knowledge creation. At the group level, transformational leadership is crucial in strengthening the integration and shared mental models as part of knowledge sharing, as well as in terms of innovation in knowledge creating. However, transactional leadership is effective at the group level in coordinating knowledge exploitation. At the organizational level, transactional leadership is effective in terms of systems (IS, KM) and institutionalization of knowledge exploitation. At this level, there is no role for transformational leadership in managing organizational knowledge.

Although the context of Bryant's model is that of knowledge cultivation in a business organization, the variation in leadership style according to organizational level and the phases of the knowledge cycle is also important in the context of scientific research. For Bryant, the primary activity of the group level is knowledge sharing, although knowledge is also created (innovation) and exploited (coordination) at group level. In this sense, Bryant is inclined to see individuals as subjects of knowledge, not a group. Bryant sees transformational leadership as essential to facilitating the process of bringing individual ideas, metaphors and innovation together into a more cohesive and integrative whole. When we interpret this facilitation as a social process of committing group members to certain key concepts of a research endeavour, we come closer to knowledge creation than knowledge sharing. If we see the facilitation process as partially rational and partially arational integration of epistemic principles of justification of beliefs, the facilitation process can be understood as leadership of knowledge creation.

Bryant (2003) relates transactional leadership to coordination of group processes conducive to knowledge exploitation towards the goals of the team. As transactional leadership tends to reward

Table 2. Types of Leadership Behaviour as Examples of Loci, Objects, Bases, and Foci of Commitment in Leadership. Follower's perspective. (Sample Items from the MLQ (5X); the first three columns adapted from Bass & Riggio 2006, 21.)

Type of Leadership	Factor	Sample Item of MLQ (5X)	Locus of Commitment	Object of Commitment	Main Bases of Commitment	Main Focus of Commitment
Transformational leadership	Idealized Influence (Attributed Charisma)	My leader instills pride in me for being associated with him or her.	Actor	Leader	Emotion	Moral
	Idealized Influence (Behaviours)	My leader specifies the importance of having a strong sense of purpose.	Idea	Purpose	Emotion Obligation	Moral Economic Administrative Political
	Inspirational Motivation	My leader articulates a compelling vision of the future.	Idea	Vision	Emotion Obligation	Moral Political Aesthetic
	Intellectual Stimulation	My leader seeks differing perspectives when solving problems.	Idea	Broadmindedness Tolerance	Emotion Utility Obligation	Epistemic Moral Economic Political
	Individualized Consideration	My leader spends time teaching and coaching.	Actor	Leader	Emotion Utility Obligation	Moral Economic Political
Transactional leadership	Contingent Reward	My leader makes clear what one can expect to receive when performance goals are achieved.	Idea	Performance	Utility	Economic Political
	Management-by-Exception (Active)	My leader focuses attention on irregularities, mistakes, exceptions, and deviations from standards.	Idea	Compliance	Obligation	Economic Political
	Management-by-Exception (Passive)	My leader shows that he or she is a firm believer in "If it ain't broke, don't fix it."	Idea	Standards	Obligation	Economic Political
Non-leadership	Laissez-Faire	My leader delays responding to urgent requests.	Idea	Status quo	Emotion Utility Obligation	Economic Political

structure and conformity to rules, some creative ideas may be dampened as they fall outside the direct scope of the team. In the context of a research team and creation of knowledge, coordination may be understood as limitations on knowledge formulation. As the team has an epistemic focus as well as limited resources in time, money and talent, the employment of resources has to be coordinated to achieve the goal of knowledge formulation. Coordination may take place as rejecting some emerging concepts and epistemic principles of justifying beliefs. This may also happen in a latent way, as some concepts or principles show themselves to be contrived – or when people who are assumed to believe in them are seen as unconvincing. Some people have a good reputation and some of doubtful or even bad reputation in terms of their conceptual commitments. The latent coordination of conceptual beliefs may be hard to see as transactional leadership, because it is understood as a relatively transparent exchange of rewards for performance goals. It may be that – in the research context – transactional leadership is more subtle and closer to certain elements of transformational leadership responsible for maintaining the focus rather than questioning it.

When transformational leadership is understood as building group members' motivation to commit to a set of key concepts and epistemic principles of justification of beliefs, loci, objects, bases, and foci become relevant in the analysis of the nature of motives of commitment. In the theory of transformational leadership, the behaviour of the leader is crucial for the motive to emerge. In the following, the behavioural factors of transformational leadership are analysed as leading to epistemic and social commitments relevant for conceptual commitment.

Individualized Consideration and Conceptual Commitments

Individualized consideration (see Avolio & Bass 1991; Bass & Avolio 1994) means that the leader gives followers personal attention and builds a considerate relationship with each individual, focusing on that person's needs. The leader acts as coach or mentor and provides challenges and learning opportunities. The leader delegates in order to raise skill and confidence. Delegated tasks are monitored to see whether the followers need additional direction or support and to assess

progress. Some tolerance for mistakes is seen as part of learning. Consequently, followers are more likely to be willing to develop competence and take the initiative. Followers feel trust and respect for the leader who has exhibited trust and respect for the followers in the process of leadership him/herself.

In terms of commitment, the leader's personal attention to the needs of followers, acting as coach or mentor, and mutual trust and respect imply that followers commit to an actor – the leader – rather than an idea. The leader reciprocally commits him/herself to each of the followers individually. Leader and follower become socially close to each other – and this is known to other members of the group who also become socially close to the leader. In individual consideration, there is no implication of commitment to a goal. For monitoring of the delegated tasks, some elements are identified: additional direction or support and progress of learning in terms of skills and confidence. There is an assumption of direction, but emphasis is on *building confidence to free and improve individual resources*. This requires strengthening of trust and respect. In the context of a research team, individual resources are both epistemic and social. Individualized consideration of conceptual commitments in knowledge creation may refer to monitoring the adoption of key concepts in scientific reasoning as well as attention to the needs of the followers to learn the justification principles of knowledge claims relevant for the key concepts better. Researchers are individually encouraged to open up their scientific thinking and its social connections to group dynamics, showing the quality of their epistemic and social resources to do research within the team.

As commitment assumes public communication of beliefs, individual consideration may motivate researchers to speak openly about their doubts over some key concepts or epistemic principles. The strengthening of trust and respect requires that communication of doubts is understood as helping and supporting. Given the atmosphere of disinterestedness, helping, and social closeness, the focus of a follower's *commitment to a leader* is predominantly *moral* and the base of commitment is *obligation and emotion* rather than utility. Even if the researcher may not be fully confident about the value of a key concept or the elevated epistemic principles, he or she may feel obliged to use them and communicate positively about them, as the

leader has shown trust in and respect for the work of the researcher in question. In this sense, epistemic commitment is mixed with social commitment.

Intellectual Stimulation and Conceptual Commitments

Intellectual stimulation (see Avolio & Bass 1991; Bass & Avolio 1994) describes leadership behaviour which encourages followers to be innovative and creative by rethinking old ways of doing things and using their imagination for reframing problems. The leader provides a flow of ideas, questions assumptions, creates a broad, imaginative picture and encourages followers to come up with their own structures and solutions to problems. The message is that followers should feel free to try out new approaches, and their ideas will not be publicly criticized because they differ from those of the leader.

When individual consideration generates the confidence to free individual resources, intellectual stimulation is to encourage followers to use *individual resources creatively*. The ideas of followers are important for the success of the team. The object of commitment is now an idea, *the principle of questioning* old ideas, rather than an actor, the leader. The principle of questioning means broad-mindedness and tolerance (see Table 2). In a research team, these attitudes are important for the generation of new epistemic ideas, for example, new concepts, and their social representatives, including eminent scholars, new research collaboration, and new conferences. Members of the team should communicate their new conceptual ideas, share them for further questioning. As both the leader and the followers are sources of new conceptual ideas (and possibly people external to the team), there is no special social relationship between the leader and an individual follower. There is no implication of commitment to a goal and no assumption of direction. Members of the team are expected only to contribute to a common pool of new epistemic and social resources.

The focus of the commitment to the principle of questioning is certainly epistemic, but it may also be political, in the sense of questioning the present social order within the research team and around the base organization and the relevant networks. Some ideas may undermine the credibility of the present leader either in epistemic or

social terms. *Open criticism* can be a social threat, although the criticism may be levelled only at epistemic ideas, because one may be committed to the idea that is being criticized. The base of the commitment to the epistemic principle of questioning may be utility, since new epistemic ideas may improve the quality of team's research. But it may also be obligation ('I should do what they expect me to do') or emotion ('Open questioning is fun!'). The base of political commitment to the principle of questioning is – to take a few examples – utility, when new epistemic ideas are seen as vehicles of status or power competition within the group; obligation, when the generation of new epistemic ideas is seen as loyalty to the leader who has encouraged their generation; and emotion, when the social tensions created by new ideas are felt to be exciting.

The process of the generation of new ideas creates a plethora of possible new objects of commitment. The initial commitment to a new idea may arise from any motive (a combination of foci and bases), for example, from the aesthetic structure of the new idea or aesthetic aspects of the narratives an eminent scholar cultivates in his or her oral presentations. Initial commitments are part of creative communication where new ideas are tested before their acceptance for deeper analysis in the research team.

Inspirational Motivation and Conceptual Commitments

Inspirational motivation (see Avolio & Bass 1991; Bass & Avolio 1994) describes leadership behaviour through which leaders motivate and create meaning for those around them by creating a clear picture of the future that is both optimistic and attainable. Leaders display enthusiasm and optimism, set high expectations, use symbolism to focus efforts, and communicate an attractive vision to followers in simple language. Followers react to these expectations by willingly increasing their efforts to attain the vision.

When individual consideration and intellectual stimulation do not imply a direction or goal, inspirational motivation does, picturing an *appealing future*. As an object of commitment, it is an idea, not an actor. However, if the leader is practically the only one who can communicate this vision in a rich, logical and attractive way, the commitment

to the leader and commitment to the vision may coincide (see idealized influence below). In the context of research and conceptual commitment, the appealing future is related to the *plausibility of visionary concepts* and their role in the generation of hypotheses and justification of new scientific knowledge claims. The plausible concepts originate from the pool of epistemic ideas which has resulted from commitment to the principle of questioning. Only one or a few concepts may emerge as the elevated objects of commitment.

The focus of commitment to a visionary concept may be predominantly epistemic, but the base of commitment can vary and include several bases at the same time. Being utility, epistemic commitment may be related to the potential of formulating new knowledge. When the base is obligation, the commitment to the concept is normative. Epistemic normativity is part of methodology where application of one rule may impose requirements on choice from a limited set of rules. If emotions can ever be bases of epistemic commitment they may relate to the experience of logical purity, simplicity or the depth of understanding. In addition to epistemic motives, commitment to a plausible concept in research can be moral, administrative, political and aesthetic. Moral commitment may result from a promise to test the utility of the visionary concept. Administrative commitment is related to the agreed on division of labour in the research work, if group work is needed, for example, in testing the explanatory value of the concept in different empirical settings. Political commitment means such things as loyalty to the leader and colleagues who have decided the research design based on the visionary concepts. Aesthetic commitment to these concepts may be related to the beauty of the structure of the epistemic utilities (simplicity, semantic information, accuracy etc.) of the new construct. The analysis of the relevant bases for the foci of commitment is complex and beyond the scope of this article.

Idealized Influence and Conceptual Commitments

Idealized influence (see Avolio & Bass 1991; Bass & Avolio 1994) describes the behaviour of leaders that provides role models for their followers. Leaders show great persistence and determination in the pursuit of objectives. They demonstrate high

standards of ethical and moral conduct, consider the needs of others over their personal needs, and share the success and limelight. They avoid using power and share risks with followers. As a result, the leaders are admired, respected and trusted. Followers identify with them and want to emulate them.

While inspirational motivation implies a direction for followers, idealized influence *legitimizes and stabilizes the direction*. In the process, *the leader emerges as an object of commitment*. Idealized influence (or charisma) generates social order over a period of time. In the context of a research team, social order and epistemic order overlap. The leader may be an admired example of top research in the application and understanding of the potential of the visionary concepts. In this way, followers are committed to the leader at the same time as they are committed to his or her mode of scientific reasoning or intellectual style. Moral commitment to the leader may be strong as he or she can be counted on to do the right thing. Political commitment to the leader is obvious as followers admire him or her as one of the authorities (*primus inter pares*) or a trendsetter. Political commitment also affects the organization of scholarly work, for example, the practices of collegial assessment of the quality of research work. The base of political commitment may be predominantly emotion, especially if the leader is admired irrationally without followers being able to rationally legitimize or question his or her position. Followers believe in the epistemic ideas of the leader *involuntarily*. In extreme cases, the leader's conceptual thinking is emulated and followed without rational analysis, leading to stagnation of the whole research programme in the long run. In some cases, the retreat to intellectual stimulation and commitment to the principle of questioning may prove to be challenging.

5 CONCLUDING REMARKS

Commitment to key concepts in research work can be analysed as part of the leadership of a research team. The model of commitment including the loci, objects, foci, and base of commitment can reveal the complexity of social relations constitutive of leadership processes in general and in the context of scientific research in particular. Conceptual commitments are elementary parts of knowledge

creation in a group, since the creation of scientific knowledge as the justification of beliefs is impossible without theoretical and empirical concepts. As commitments are social phenomena, they are also part of leadership. In this way, *leadership is an integral part of knowledge creation, not just part of knowledge sharing or knowledge exploitation* within a group or, more generally, an organization. Leadership introduces, strengthens and weakens voluntary and involuntary beliefs that some concepts are either right or better than some others. Only part of the conceptual commitments and epistemic principles are rationally justified by the followers themselves. Other parts are believed voluntarily (trusting other researchers' epistemic justification) or involuntarily (following arational commitments). Consequently, the epistemic validation of the resulting scientific knowledge is always partly social.

As leadership is internally constitutive of the beliefs of individual members of a research team, the justification of beliefs is not only epistemic but both epistemic and social and not only rational but both rational and arational. The beliefs of an individual researcher are partly based on rational and arational trust of the knowledge of other researchers. The dividing line is not between beliefs (assumed to be involuntary, hence arational) and acceptance (assumed to be voluntary, hence rational) but between rational and arational beliefs. To the extent that the knowledge is created within a research team, the social rationalities and arationalities affect the individual justification of beliefs. Consequently, it is adequate to say that a group is a knower, as no member of the group has justified all the knowledge the members of the team know together and as all members have to trust to some extent in other members of the team in their own justification of beliefs. However, as justification can differ between members even if their beliefs are the same, *it is not right to say that members know the same irrespective of their principles of justification*. The truth of the beliefs is not a sufficient condition for the collective knowledge, as knowledge assumes evidence that can be justified in addition to the concept of truth. If we want to make the difference between collective knowledges of different teams creating knowledge about the same research object, we probably have to pay attention to the principles of justification of knowledge claims, as we are not able to estimate how close they are to the truth without comparing

their justification principles.

The principle of justification assumes a collection of key concepts. Within a team with *collective knowledge, the justification of the key concepts must be shared* by the members of the team. As the goal of a research team assumes division of research labour in many cases, epistemic commitments to concepts are not sufficient, be they based on the researcher's own justification or on trust in other researchers' justification. Social commitments expressed by division of labour are needed. They are at least moral, economic, administrative, and political. These create the collective intention, organic solidarity, and the internal organization of a research team, including its leadership. Consequently, the epistemic and social value of different concepts may vary depending on the division of labour. Even researchers whose work is very similar in terms of using the same concepts may differ in their justification of those concepts. The mutual trust of researchers and the trust between the leader and the followers affect the individual experience, determining whose justification of conceptual beliefs are taken for granted and whose are reconsidered. *The similarities of conceptual beliefs are based on a mixture of epistemic and social commitments intended by leaders or emerging within leadership processes*.

Transformational leadership can illuminate the processes that lead to common processes of justification. This is based on the ability to create shared commitments. Intellectual stimulation creates commitment to the principle of questioning old concepts. Inspirational motivation creates commitment to visionary concepts that are seen as plausible in knowledge creation. Individual consideration and idealized influence create commitment to a leader. In the context of research, commitment to an individual leader may not reflect the situation in the majority of research teams. Yukl (1999) contends that the transformational theory of leadership has a heroic leadership bias. An alternative perspective could be that leadership is understood as a shared process of enhancing the collective and individual capacity of people to accomplish their work roles effectively. As Bass and Riggio (2006, 81–98) argue, the contingencies of environment, task characteristics, goals, and leadership-subordinate relations affect the effectiveness of transformational leadership as against that of transactional leadership. The contingencies of research may affect the strength of transformational leader-

ship as an attribute of a team as distinct from an attribute of an individual as well as the more subtle nature of transactional leadership.

Collective (as opposed to individual) or functional (as opposed to positional) interpretation of transformational leadership is plausible within the context of the research team, emphasizing the importance of social relationships as well as the mixture of epistemic and social commitments. The concept of commitment is fruitful as it pays attention to the public or latently public nature of rational and arational questioning, justification and maintenance of beliefs. Although the standard theory of transformational leadership sees a moral focus and emotional base as overwhelmingly important, a closer look reveals that several bases and foci of commitment are in play. The nature of transactional leadership in research is probably different from that of transactional leadership in business. The nature of transactional leadership may also differ between basic and applied research. Further research is needed to illuminate the variety of foci and bases of conceptual commitments relevant for understanding leadership in research work.

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