



# Scientific Management revisited

## Did Taylorism fail because of a too positive image of human nature?

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### Abstract

**Purpose** – The purpose of the paper is to critically question conventional views of the one-dimensional, mechanistic and negative image of human nature of Scientific Management. Both for worker behavior and for managerial behavior positive aspects of an image of human nature are reconstructed in organizational economic terms.

**Design/methodology/approach** – Through institutional economic reconstruction, drawing on the methods and concepts of organizational and institutional economics, the portrayal of workers and managers by Scientific Management is critically assessed.

**Findings** – It is suggested that a conceptual asymmetry exists in Taylor's writings regarding the portrayal of human nature of workers and managers. Whereas for workers a model of self-interest was applied (through the concepts of "systematic soldiering" and "natural soldiering"), Taylor portrayed managers through a positive, behavioral model of human nature that depicted the manager as "heartily cooperative". The key thesis is that by modeling managers through a rather positive image of human nature Taylor could no longer *methodically* apply the model of economic man in order to test out and prevent interaction conflict between potentially self-interested managers and workers.

**Research limitations/implications** – The paper focused on Scientific Management to advance the thesis that the portrayal of human nature has been ill approached by management and organization theorists who were apparently pioneering an institutional and organizational economics. Future research has to broaden the scope of research to other pioneers in management and organization research, but also to critics in behavioral sciences, such as organization psychology, who may misunderstand how economics approaches the portrayal of human nature, in particular regarding self-interest.

**Practical implications** – Taylor's portrayal of managers as naturally good persons, who were not self-interested, caused implementation conflict and implementation problems for Scientific Management and led to his summoning by the US Congress. By modeling managers as heartily cooperative, Taylor could no longer analyze potentially self-interested behavior, even opportunistic behavior of managers in their interactions with workers. Scientific Management had thus no remedy to handle "soldiering" of managers. This insight, that managerialism needs to be accounted for in a management theory, has manifold practical implications for management consultancy, management education, and for the practice of management in general. Students and practitioners have to be informed about the necessary and useful role a model of self-interest (economic man) *methodically* plays in economic management theory.

**Originality/value** – The paper reconstructs the portrayal of human nature in early management theory, which seemingly anticipated the advances – and certain pitfalls – of modern institutional economics. The paper unearths, from an economic perspective, conceptual misunderstandings of Taylor regarding his image of human nature of workers and managers.

**Keywords** Scientific management, Taylorism, Human nature, Industrial relations, Conflict

**Paper type** Research paper



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The indispensable prerequisite for bringing in an era of industrial peace was a radical change of heart on the part of employers. [...] Taylor could not make this too emphatic. Over and over again he said that employers must undergo a change of heart like unto that of a religious conversion (Copley, 1919, pp. 8-9).

## Introduction

Organizational economics, including institutional economics, are frequently criticized because of their claimed negative image of human nature, which seemingly portrays human beings as purely self-interested or even outright opportunistic persons. For instance, behavioral economists (Sen, 1990; Simon, 1976, 1993, 1997) or sociologists (Etzioni, 1988; Morgan, 1997) bring forward such criticism. At times, even institutional economists are rather self-critical in this respect regarding their claimed assumptions about human nature and the portrayal of economic man (e.g. Williamson, 1985, pp. xxi-xxiii, 44, 391). Such claims regarding a negative image of human nature in organizational economics may reflect a methodological misunderstanding (Wagner-Tsukamoto, 2003, 2007a). It can be argued that the model of economic man is instrumentally, methodically useful for the *economic* analysis and resolution of interaction conflict, specifically the testing of the incentive compatibility of institutional structures (governance structures). Economic man functions in this respect as a mere tool or method to examine incentive structures. This also implies that a moral assessment of organizational economics, including its image of human nature, has to focus on the theoretical and practical achievements that are generated by methodically applying the model of economic man. This paper analyses these issues by reconstructing the portrayal of human nature of Scientific Management in institutional economic terms. The paper shows that Taylor was an early organizational and institutional economist who misunderstood to a considerable degree how to instrumentally, methodically apply the model of economic man in his organization theory. The paper makes here various points which are not only insightful for advancing our knowledge on Scientific Management but also for fostering economic theory about formal, institutional organization.

There are longstanding accusations of a negative image of human nature being portrayed by Taylor's key works (1895a, 1895b, 1903, 1909, 1911, 1912). The key accusation is that Taylor fell for a too mechanistic, too inhumane image of human nature. Such criticism has been persistently voiced ever since Taylor published his works on Scientific Management (e.g. Braverman, 1974, pp. 86-7; Burrell and Morgan, 1979, pp. 144-6; Casey, 2002, pp. 72-3; Clawson, 1980, pp. 205-6; Guillen, 1997, p. 688; Jones, 2000, p. 632; Knowles and Saxberg, 1967, pp. 22-32; Morgan, 1989, p. 51; Waring, 1991, pp. 11-12; Warner, 1994, p. 1158; Herzberg, 1966; Mayo, 1933, 1949, 1990; McGregor, 1960).

Regarding worker behavior, the paper partly agrees with these accusations of a too negative image of human nature. It does so in a comparatively novel way by examining references of Taylor himself to a positive image of worker behavior that is incompatible with his otherwise rather negative portrayal of the worker. But in part, the paper discounts the accusation that Scientific Management had a negative image of worker behavior. It does so, firstly, by examining Taylor's concept of human capital and how organization members could be trained to be more competent. Secondly, the paper qualifies Taylor's negative portrayal of worker behavior as a methodological self-misunderstanding of an early organizational economist, namely as a confusion of

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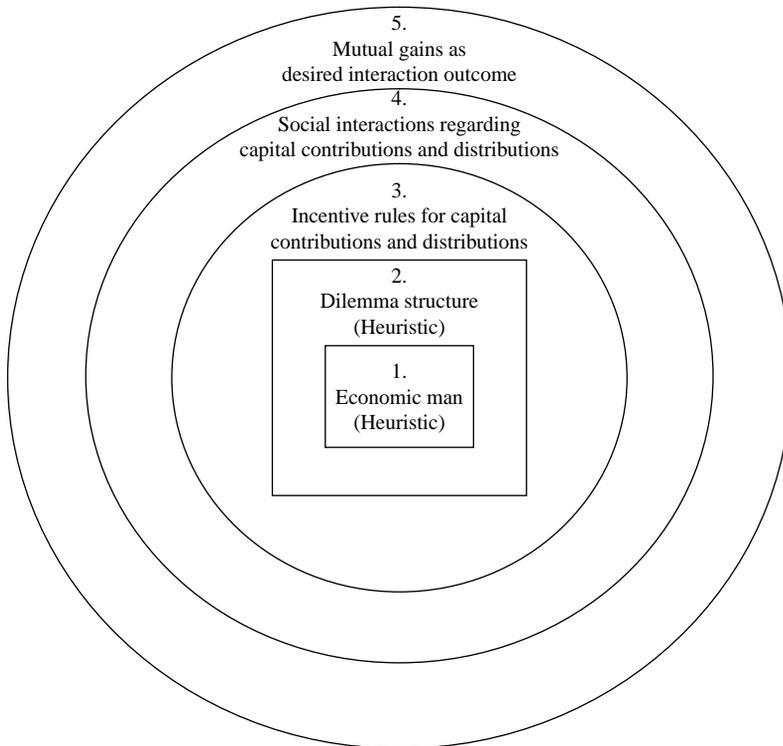
methods of organizational economics – especially the model of economic man (self-interest) – with empirically testable variables of behavioral organization research. The latter thesis gains further support by looking at Taylor’s depiction of managerial behavior. Taylor portrayed managers in rather positive, behavioral terms as heartily cooperative. In this respect, Scientific Management revealed a positive image of human nature, however one that proved unhelpful for the resolution of interaction conflict between managers and workers. The paper argues that regarding managerial behavior Taylor fell for the same methodological self-misunderstanding as for worker behavior, but he was mistaken in a different way. For worker behavior he “only” camouflaged a methodological role of economic man with a negative, empirical, behavioral description of the worker. This still allowed him, albeit in methodologically misconstrued terms, to re-enter organizational economic analysis and the discussion and resolution of interaction conflict that was instigated by potentially self-interested workers. In contrast, in his analysis of managerial behavior, Taylor actually replaced the model of economic man with the model of the heartily cooperative, good man. This prevented him from re-entering organizational economics, even in misconstrued methodological terms and this ultimately caused significant practical implementation problems for Scientific Management and Taylor’s summoning and questioning by the US Congress (published as Taylor, 1912). Then, Taylor had to testify on the nature and claimed social dangers of Scientific Management.

My theses shed new light on the debate of the image of human nature of Scientific Management and qualify and discount widespread views that Taylor had a simplistic, mechanistic and empirically incorrect image of human nature. This is the more important since even today techniques of Taylorism remain widespread in certain industrial settings (Jones, 2000; Pruijt, 1997, 2000).

The paper proceeds in three steps. In a first part, the instrumentally useful role of economic man in organizational economics is discussed. It is argued that economic man reflects a mere method of organizational economics but not an empirically testable image of human nature. In a second part, the paper analyzes the portrayal of worker behavior under Scientific Management. The key argument is that Taylor only intuitively sensed a methodical application of economic man in organizational economics; in particular, he mistakenly characterized economic man in his analysis of worker behavior in empirical, behavioral terms. This, in turn, gave rise to much unnecessary, behavioral criticism of Taylor’s seemingly negative image of human nature. In a third part, the paper analyzes how Taylor portrayed managerial behavior. The key thesis is here that Taylor basically exited from organizational economics when depicting the manager as heartily cooperative, good man and that this exit had grave consequences for the implementation success of Scientific Management.

### **Organizational economics and the methodical application of the model of economic man**

Organizational economics can be said to belong to the larger body of the New Institutional Economics (e.g. Williamson, 1975, 1985). It analyzes organizational behavior as contribution-distribution interactions that are governed by incentive structures, such as a salary system. The key purpose of incentive structures is to realign self interests among organizational members in such a way that mutual gains emerge as interaction outcome (see elements 3, 4 and 5 of Figure 1). Key concepts of



**Figure 1.**  
The institutional economic  
approach

institutional economics are here: “interest equilibration”, “interest compatibility” and “interest congruency” of interacting agents (Williamson, 1985).

In the factory of Taylor’s time, the key interaction partners were workers and managers (the functional foremen). Their interactions can be reconstructed as contribution-distribution exchanges. Through a detailed system of work procedures, Taylor laid out what type of human capital and other types of capital workers and managers had to contribute. Taylor essentially discussed capital distributions through a premium wage system (an “incentive structure”). Organizational economics argues that for the purpose of this kind of governance analysis, the model of economic man plays an instrumentally useful, methodical role, not dissimilar to a crash dummy in the artificial, unreal setting of the car crash test (Wagner-Tsukamoto, 2003). Organizational economics functionally applies the model of economic man as a mere tool to test out incentive structures for their *incentive compatibility*, to use a term of Williamson (1985, p. 76). Incentive compatibility of governance structures implies that through incentives management interaction conflict can be resolved even among potentially self-interested agents in a mutually beneficial way. Thus, organizational economics approaches interaction conflict strictly as a *situational* condition that is caused by problematic, “defective” incentive structures.

All organization theories have in common that they *heuristically* – instrumentally, methodically – invoke a model of human nature and a model of social conflict, albeit different ones. Organizational economics draws here on models such as economic man

and the prisoners' dilemma or the commons dilemma. Only heuristically organization members are modeled as economic men: as self-interested agents who evaluate and choose a course of action in relation to gains and losses that are signaled by incentive structures (Figure 1; for further details on this argument, see Hardin, 1968; Homann, 1994; Homann and Suchanek, 1989, pp. 79-80; Luce and Raiffa, 1957; Wagner-Tsukamoto, 2003, Chapters 1 and 2, 2005, 2007a). Similarly, behavioral organization research also heuristically invokes a model of social conflict and a model of human nature. For instance, social conflict is modeled as role conflict and the model of "homo sociologicus" is heuristically applied – as a mere, instrumental fiction, as Dahrendorf (1973, pp. 7, 50, 58, 78) so vehemently stressed. Other comparable heuristic models of behavioral organization research are psychological man and psychological interaction conflict. Herzberg (1966, p. 170) speaks of a "psychic pathology" in organizational behavior or Ackroyd and Thompson (1999, pp. 1-3, 25) speak of an "endemic condition of organizational misbehavior".

A key thesis for assessing the image of human nature of organizational economics in *empirical* and *theoretical* terms is then that concepts of incentive structures, interactions over capital contributions and distributions, and the interaction outcome of mutual gains have to be focused on. They reflect empirically testable and morally assessable theoretical and practical concepts of economics. Friedman (1953) implied this early on (for further references, see Wagner-Tsukamoto, 2003). However, ideas of "economic man" and "interest conflicts" are research heuristics; they are of a pre-empirical, quasi-tautological and sub-theoretical nature. In contrast, organization psychology or organization sociology can more directly focus on qualities of the human condition as such since this is reflected by their specific theoretical and practical approach to organizational analysis. They conceptualize organization structures not as incentive structures, at least not in the first place, but as value structures, role structures or organizational culture.

In general, research heuristics methodically drive theory-building and practical intervention but they are not theoretical or practical concepts as such. They are beyond empirical, behavioral and moral, behavioral scrutiny – but, of course, not so the theoretical propositions and practical results generated with these tools. Indeed, if the model of economic man and the model of a dilemma structure were given up in organizational economic analysis, much ineffectiveness of economic intervention at the level of managerial decision making could be expected. And the historic case study of implementation failure of Taylorism demonstrates this, as the present paper subsequently shows (similarly see Wagner-Tsukamoto (2008) for Quaker managers).

Hence, for the purpose of organizational economics, the accusation of economic man as an empirically incorrect and as a morally questionable image of human nature and social life misses its target. Morgan's (1997, pp. 77, 91) criticism of the model of economic man as a "laughable caricature" and related suggestions to dispatch economic man into a "realm of fairy tales" (Heinen, 1976, p. 395; Donaldson, 1995, p. 184, 1990, p. 373) are flawed in multiple ways. As already noted, any social science research program that models human nature applies such seemingly unrealistic and empirically incomplete tools. The very idea of "modeling" implies that human nature is not portrayed in a holistic, philosophical sense. For another thing, empirical, behavioral criticism that targets research heuristics overlooks that research heuristics, such as economic man, have to be evaluated with respect to the theoretical and practical outcomes they help to generate. And here organizational and institutional economics in

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the tradition of Buchanan, North or Williamson have little to fear. Various ethical ideals can be derived from their studies (Wagner-Tsukamoto, 2003, pp. 202-6).

Even among organization theorists who were leaning towards or fully applying the economic approach a misunderstanding of the heuristic nature of models like “economic man” may be widespread. This is reflected by apparent self-criticism of the likes of Taylor, Simon or Williamson, who in considerable degrees pioneered different aspects of organizational and institutional economics. They self-criticized in considerable degrees their models of human nature as not corresponding with “human nature as we know it” (Williamson, 1975, pp. 1-2, 1985, pp. xxi-xxiii, 44, 391) and as a reflection of a morally dehumanized image of human nature (Simon, 1976, p. xxi, 1993, 1997, pp. 42-5, 52; Williamson, 1985, pp. 44, 391, 1993, p. 453; Taylor, 1911, p. 29). For instance, regarding Scientific Management, it has to be carefully examined whether Taylor’s skill formation program, which was seemingly based on the model of economic man, actually led to up-skilling or the down-skilling of human capital in the factory. Also, an organizational economic reconstruction of Scientific Management can investigate how far implementation conflict and implementation failures that surrounded Scientific Management in Taylor’s time and that led to Taylor’s summoning by the US Congress can be attributed to the wrongful application of economic research heuristics (the model of economic man, and the idea of a dilemma structure). In the following, I argue in this respect that Taylor was rather inconsistent when it came to the heuristic, methodical modeling of workers as compared to managers. A conceptual disconnect – at the methodological level of research heuristics, in particular the application of the model of economic man – exists here in his work. Whereas workers were rather consistently modeled as economic men that are caught up in an economic dilemma structure, managers were modeled as not-self-interested, good, cooperative and noble organization men. The key thesis of my paper is here that this asymmetry and inconsistency at a heuristic level of organizational economics led to the practical ineffectiveness of his organization theory, in particular the “defecting” behavior of managers, who were not sufficiently bound and controlled under Scientific Management. Thus, implementation failures in Taylor’s time can be directly linked to the replacing of economic man when it came to the heuristic modeling of managers and the positive, humanist portrayal of the manager as “heartily cooperative”.

### **Scientific Management and the portrayal of worker behavior: skill formation, human capital and the camouflaging of economic man**

Taylor’s discussion of worker skills and of their work-avoiding behavior allows for various conclusions regarding his image of human nature of the worker. When talking about worker skills, Taylor suggested the idea of “insufficient mental capacity”. The present paper here shows that already Taylor’s own writings do not support this psychologically based conceptualization of worker behavior and the implied negative image of human nature of the worker. Second, a more positive image regarding the skilful worker emerges when Taylor’s idea of competence building is looked at. Finally, Taylor’s discussion of “systematic soldiering” and “natural soldiering” is examined. I outline that Taylor did not fully realize the heuristic nature the idea of soldiering takes on in the analysis of incentive effects of organization structures. He portrayed worker behavior in an empirical, behavioral sense as actual economic man-behavior. This reflects a methodological self-misunderstanding of an organizational economist, however one

which still allowed him to re-enter organizational economics (albeit in methodologically misconstrued terms).

*Insufficient mental capacity of workers as a psychological pre-requisite for skill formation under Scientific Management?*

In rather frank language, Taylor characterized workers whom he viewed as ideally suited for being trained under Scientific Management as being equipped with “insufficient mental capacity” (Taylor, 1895a, p. 75, 1903, pp. 28, 141-2, 1911, pp. 26, 41, 59). He linked effective skills formation to such psychological features of human nature:

Now one of the very first requirements for a man who is fit to handle pig iron as a regular occupation is that he shall be so stupid and so phlegmatic that he more nearly resembles in his mental make-up the ox than any other type. The man who is mentally alert and intelligent is for this reason entirely unsuited to what would, for him, be the grinding monotony of work of this character (Taylor, 1911, p. 59, 1907/1995, p. 13).

If it were the case that Taylorism required “stupid” people for effective skills utilization, a rather negative image of human nature had to be suggested for Scientific Management. However, these suggestions of Taylor can be challenged in different ways. One counter-argument is here to show that those whom he viewed as “stupid and phlegmatic” and well suited for Scientific Management were not stupid and phlegmatic after all – but still performed effectively under Scientific Management. Another counter-argument against insufficient mental capacity as an input feature of human capital utilization under Scientific Management draws on the insight that those whom he viewed as intelligent and thus *unsuitable* for Scientific Management also performed effectively under Scientific Management. Both types of counter-arguments imply that simple tasks, which were characterized, for example, by “monotony of work” (Taylor, 1911, p. 59), did not reflect on psychological features of human nature (a character trait, for example) but merely were a task feature of capital utilization (a “capital contingency”), which could be systemically handled in order to influence behavior. For example, if monotony characterized skills utilization, incentive structures and distribution payments and benefits of one kind or another can be provided to compensate organization members for such work. The modern organization psychology literature, especially on the interrelationship between “person-organization fit” and its link to job performance helps to develop such counter-arguments (e.g. Hoffman and Woehr, 2005; Mischel, 1968; Pervin, 1989). Psychological character and personality traits theories for effective work performance are here discredited. However, already from Taylor’s own writings both types of counter-arguments can be derived, too.

Of course, the human relations school or (neo-)Marxist writers on organizational behavior had a field day in questioning and disproving Taylor’s suggestions on intrinsic, invariant, psychological features of human nature and their relationship to meaningful work (Clawson, 1980; Edwards, 1979; Herzberg, 1966; Knowles and Saxberg, 1967; Mayo, 1933, 1949). But Taylor’s own studies, especially on the worker “Schmidt”, already indicate that characterizations such as “ox” (Taylor, 1911, p. 59) or the “mentally sluggish type” (Taylor, 1911, p. 46) were untenable and that Taylor was conceptually really after something altogether different – which was overlooked by the human relations school or (neo-)Marxist writers. For instance, regarding Schmidt, Taylor reports that Schmidt was a rather successful problem-solver in everyday life:

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Schmidt had acquired some land and was building a house (Taylor, 1911, pp. 43-4). Seemingly, Schmidt understood ideas like property and investment and he had not only the physical skills of the “ox” but also cognitive and motivational skills that are needed for building a house. He seemingly was a complete person and Taylor’s writings clearly stress this. In this connection, it does not greatly matter whether Schmidt actually existed or whether Taylor invented him (as apparently hinted by Wren (2005, pp. 134-5) and also Wrege and Perroni (1974)). If Schmidt did not exist or at least not in the way depicted by Taylor, this is possibly even the more intriguing since it implies that Taylor was intentionally making here an important *conceptual* qualification when he gave the example of Schmidt building a house. The example implies that his otherwise narrow, psychological characterization of Schmidt as an “ox” needs to be revised and should not be taken at face value.

That Taylor advanced ideas on the ox and the mentally sluggish type at all can be related to his lacking understanding of basic person-organization fit issues, as the modern literature on work psychology explores. Taylor’s stereotypes can also be explored from a sociological position, Taylor being born into the American upper class (O’Connor, 1996, p. 43; Wren and Greenwood, 1998, p. 134). And indeed, at times, Taylor openly attested to holding social stereotypes about workers:

I remember very distinctively the perfectly astonishing awakening at the end of six months of my apprenticeship (on the shop floor), when I discovered that the three other men who were with me in the pattern shop were all smarter than I was (Taylor, 1909, p. 85).

Merkle (1980, p. 25) gives further examples of potentially class-related misconceptions held by managers, engineers and businessmen in Taylor’s time (Braverman, 1974; Littler, 1978).

Taylor’s argument that insufficient mental capacity is a requirement for effective skill utilization under Scientific Management can be further discounted in line with his own acknowledgement that he himself had enjoyed monotonous factory work, depicting the time he had worked at a lathe machine, despite its high degree of monotony, as “the happiest year I have had since I got out of my apprenticeship” (Taylor, 1912, p. 125). If “insufficient mental capacity” were a psychological requirement for effective skill utilization, then some disturbing conclusions had to be drawn regarding Taylor’s own state of mind. However, such conclusions are not warranted from what is known about Taylor’s life as worker, engineer, manager, businessman, consultant and researcher.

Hence, Taylor’s psychological references to insufficient mental capacity may be best read as ill-formulated statements that no special cognitive abilities were needed for training organization members under Scientific Management. From an economic point of view that focuses on human capital utilization, “insufficient mental capacity” is best read as a reference that no special input features were required for workers to be trained under Scientific Management. In some passages, Taylor seemed to realize this clearly: “He was a man so stupid that he was unfitted to do most kinds of laboring work, even. The selection of the man (for skill formation under Scientific Management), then, does not involve finding some extraordinary individual” (Taylor, 1911, pp. 62, 7). Urwick (1978, pp. 8-9, 12) makes a comparable point for Taylor’s writings. The next section of the present paper further deepens this proposition from an institutional economic point of view when Taylor’s views on competence building are analyzed. A rather positive image of human nature of the worker then emerges.

*Competence building under Scientific Management*

From an institutional economic point of view, Taylor's *systemic* approach is especially interesting. It drew on various types of governance structures in order to raise levels of skillfulness in the firm. Taylor's key thesis was here that skills could be developed, that limits to skillfulness could be lowered and "brains" of organization members could "grow" – if organization structures were intervened with:

A man who under the old system of management has only sufficient brains to sweep the floor, under Scientific Management is trained and taught and helped so that he finally learns how to use, say, a grinding machine. [...] He is taught to do a class of work which is far more interesting and requires more brains than sweeping to which he formerly was limited (Taylor, 1912, p. 155).

Contrary to many common perceptions of Taylorism, e.g. Pruijt (2000, p. 442), Taylor kept stressing this point that through a systemic framework of institutionalized training programs the skillfulness of workers and the extent to which they could engage in meaningful work could and should be increased (Taylor, 1903, p. 45, 1911, pp. 6-7, 27, 39, 101, 114). He basically advanced the same thesis for the factory managers, the functional foreman under Scientific Management. His program aimed at the standardization and functional specialization of skills, and he favored intervention with incentive structures, such as the introduction of performance-related pay (i.e. the premium wage system), in order to improve skills formation. Clearly, in view of this, the skillfulness of employees was a variable under Scientific Management. Nadworny (1955, p. 53) even goes as far as to suggest that unskilled workers could be trained by Scientific Management to compete with craftsmen. Hence, claims that Taylor approached "personnel as a given rather than a variable in the system" (March and Simon, 1958, p. 29; Knowles and Saxberg, 1967, p. 32) are difficult to uphold. Also, Taylor's view on skilling are difficult to reconcile with the thesis of Braverman (1974), Clawson (1980), Edwards (1979, p. 99), Morgan (1986), Pruijt (1997, pp. 3-4) or Waring (1991, p. 11) that Scientific Management did aim to raise efficiency and performance levels by de-skilling labor and by lowering the extent of meaningful labor. In the historic economic context of late nineteenth century and early twentieth century USA, the typical employee who entered Taylor's factory was not a craftsman but an untrained employee, such as an unskilled immigrant, a former slave or farm worker (Wells, 1926; Phillips, 1929; Wagner-Tsukamoto, 2003, Chapter 7; Wren, 2005, pp. 246-7). In particular, Taylor did not recruit craftsmen for work in his factory. Littler (1978, p. 185) states this explicitly too, that "[...] Taylorism was not the [...] destroyer of the craft system", as explicitly argued for by Braverman (1974) and others. Monds (1976) attacks Braverman, similarly. Wren (2005, p. 247) stated in this connection: "The claim that Scientific Management de-skilled labor is a myth that needs to be put to rest". Indeed, coinciding with the rise of the Tayloristic factory, the earnings and numbers of craftsmen increased dramatically. For instance, Outerbridge (1895, p. 229) found that from 1880 to 1890 the number of carpenters rose from about 50,000 to over 140,000 and their average earnings increased by about 50 percent in this period. Or Wren (2005, p. 246) reports drawing on US Bureau Census data that from 1900 to 1920 the number of craftsmen increased by 72 percent. What Scientific Management did change was the nature of the employment relationship, moving it from loosely group-based, indirect sub-contracting within the bounds of a small business to more direct modes of employment and control in growing, larger firms (Littler, 1978,

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pp. 185, 195). In view of this, Scientific Management is probably best viewed as a skill formation program that was less ambitious than craftsmanship but which significantly contributed to a rise in industrial skills over time. It also contributed to other social achievements, such as a rise in longevity and a rise in real wage levels (Wren, 2005, p. 260). From here some rather positive implications emerge regarding Taylor's image of the worker and how he could be trained under Scientific Management. This seems to be overlooked by writers in a more Marxist tradition, such as Edwards (1979), who questions the contribution of management systems, such as Scientific Management, to the "greater good of society" (e.g. Edwards, 1979, p. viii).

*Invoking economic man through the ideas of systematic soldiering and natural soldiering*  
Taylor linked his program for skills development and skills application to a system of incentive structures, especially the premium wage system. Through this approach, so he suggested, work-avoiding behavior of workers could be targeted and controlled for. A critical question in this connection is whether such references to soldiering can be reconstructed in economic terms as the heuristic, methodical application of the model of economic man.

Taylor very clearly approached and analyzed work-avoiding behavior as a *systemic* problem but not as a problem of human nature (the human condition). He called such work-avoiding behavior "systematic soldiering". In his view, such soldiering was "systematic" because this type of work-avoiding, opportunistic behavior was systemically induced – namely by "defective" incentive structures:

By far the greatest evil from which both workmen and employers are suffering is the *systematic soldiering* which is almost universal under all of the ordinary schemes of management and which results from a careful study on the part of the workmen of what they think will promote their best interests (Taylor, 1903, p. 32, 1911, pp. 19-20, 1912, pp. 118-9, emphasis added).

According to Taylor, systematic soldiering was not a behavioral problem of lacking motivation, lacking morals or certain predispositions to laziness, as attributed by many behavioral organization researchers to Taylor (e.g. Braverman, 1974, pp. 86-7; Clawson, 1980, pp. 203-4). Rather, the concept of systematic soldiering connects to the institutional economic concept of the incentive-*in*compatibility of incentive structures. For interactions among workers, Taylor analyzed in detail how systemically unresolved interaction conflict encouraged systematic soldiering and yielded mutual loss to all organization members involved:

The common tendency to "take it easy" is greatly increased by bringing a number of men together on similar work and at a uniform standard rate of pay by the day. Under this plan the better men gradually but surely slow down their gait to that of the poorest and least efficient. When a naturally energetic man works for a few days beside a lazy one, the *logic of the situation* is unanswerable: "Why should I work hard when that lazy fellow gets the same pay that I do and does only half as much work?" (Taylor, 1903, p. 31, emphasis added).

There are certain behavioral connotations of ideas like "common tendency" and "naturally energetic"; they are discussed below when the concept of "natural soldiering" is reviewed. However, regarding systematic soldiering, Taylor analyzed interaction problems as a problem of situational, systemic defects – the "unanswerable logic of the situation". In other places, he spoke of the "demoralizing effect of the system" and the system forcing

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“[...] the best workmen continually to act the part of hypocrites” (Taylor, 1895b, p. 856). Here, he favored intervention with incentive structures to remedy these problems and to generate mutual gains as interaction outcome. An institutional economic reconstruction suggests that this analysis of worker opportunism *heuristically, instrumentally* builds on the model of self-interest. The idea of “systematic soldiering” captured exemplarily well a methodologically sound, heuristic application of the model of economic man – for analyzing destructive effects of self-interest in relation to ill-designed, incentive-*incompatible* governance structures (Wagner-Tsukamoto, 2003, 2007a; Figure 1). In the literature on Taylorism this purpose of the concept of systematic soldiering for analyzing the incentive compatibility of the situation has not been accounted for. For example, O’Connor (1996, pp. 43-4) does not mention it (for further references, see Wagner-Tsukamoto, 2003).

Yet, Taylor was not consistent regarding the “proper”, methodological, heuristic application of the model of economic man. He *also* portrayed the human nature of workers in empirical, behavioral terms when discussing self-interest, in particular through psychological references on “natural soldiering” and a “common tendency to take it easy” (Taylor, 1903, p. 32, pp. 30-2, 90, 1909, p. 87, 1911, pp. 13, 17-19, 29, 1912, p. 118). He even asserted that natural soldiering reflected an inborn feature of human nature: “Some people are born lazy [...] and others are born greedy”. (Taylor, 1911, p. 29) Such suggestions on natural soldiering are not only untenable in psychological terms (as behavioral organization research has well pointed out), but they also camouflaged a heuristic, methodological function of the model of self-interest (economic man) in organizational and institutional economics, which Taylor was seemingly after (for instance, when he discussed “systematic soldiering”). In the first place, Taylor’s concept of natural soldiering here has to be interpreted as a methodological self-misunderstanding of an early, organizational economist. The proper methodological approach was pointed out above when Taylor’s concept of “systematic soldiering” was reviewed (see also the theory section of this paper). Still, the idea of “natural soldiering” allowed Taylor to re-enter economic analysis: In terms of analytical and practical outcomes, it does not really matter whether the model of economic man is applied as a misclaimed, methodically misconstrued “image of human nature”, or, methodically properly understood, as a research heuristic (as it links to Taylor’s concept of “systematic soldiering”).

But, as we know now, damage was done in other respects. Taylor’s concept of natural soldiering invited much theoretical, empirical and moral critique of behavioral researchers regarding the apparently untenable, negative “image of human nature” of Scientific Management. Clawson (1980), Edwards (1979), Herzberg (1966), Knowles and Saxberg (1967), Littler (1978), Perrow (1983), to name a few, and many of our textbooks on organization – for instance, Arnold *et al.* (1998, pp. 457-8), Buchanan and Huczynski (1997, pp. 340-43), Huczynski and Buchanan (2007, pp. 257, 417-8) or Mullins (1999, pp. 49-52) – uncritically took Taylor’s views on natural soldiering at face value. A comparable misperception exists among organizational and institutional economists who interpret opportunism as a behavioral assumption about human nature (e.g. Barney, 1990; Donaldson, 1990, 1995; even in degrees, Williamson, 1975, 1985). They do not put a model of opportunism or “natural soldiering” into perspective regarding its methodical, heuristic role in economic analysis (the general argument was here outlined by Wagner-Tsukamoto (2003); see also the theory section above).

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**Taylor's portrayal of managerial behavior: abandoning economic man**

Taylor's misunderstanding of how to methodically apply the model of economic man showed up in another respect, too, but with more serious consequences than unnecessarily evoking criticism of humanist, behavioral researchers. However, in difference to worker motivation, which he linked in empirical, behavioral terms to natural soldiering, he portrayed the manager as naturally "good", as not self-interested and as heartily cooperative. Here he fully abandoned the model of economic man. I argue that this subsequently led to implementation failures of Scientific Management, such as strikes against Scientific Management that were caused by non-heartily, non-cooperative managers. Taylor's summoning by the US Congress (published as Taylor, 1912) tells here the story of these failures.

*Taylor's concept of the heartily cooperative manager: the call for the great mental revolution and implementation failures of Scientific Management*

Taylor was very well aware that under Scientific Management managers could easily derail cooperative interactions in the firm. This could happen through opportunistic, managerialist rule change on wage levels: "The workman must [...] be fully assured that this increase (in wages) beyond the average is permanent" (Taylor, 1911, p. 121, p. 125, 1903, p. 26, pp. 103-105, 107, 119). Taylor hoped to solve this problem by applying the concept of the heartily, cooperative manager and the related concept of the "great mental revolution of managerial attitudes". Behavioral organization research, e.g. the human relations school (Mayo, 1933, 1949) or Follett (1940), especially her concept of the "psychology of consent and participation" in the firm, seemingly picked up comparable ideas, too. Taylor appealed to managers to view it as their moral duty to be friendly and fair in interactions with workers (Taylor, 1903, pp. 63-8, 96-8, 129-32, 1911, pp. 27-9, 36-8, 114, 130, 1912, pp. 27-31, 37-45, 145-53). In this way, Taylor basically endorsed a behavioral approach to business ethics, the attempt to involve managers in nearly quasi-religious conversion, as Copely (1919, pp. 8-9) referred to Taylor's "great mental revolution of managerial attitudes" (Copely was more fully quoted at the outset of this paper). Such a behavioral, ethical approach to conceptualizing the manager may relate to Taylor's upbringing in a strict Quaker tradition (Boddewyn, 1961, p. 104; Wren and Greenwood, 1998, p. 134; Wren, 2005, pp. 121-2). In this connection, Taylor even developed a pedagogic program on how managers should be trained to become impartial, fair and cooperative (Taylor, 1912, p. 153; Goldberg, 1992, pp. 44-5, 53). These suggestions of Taylor reflect a rather positive image of human nature, however, one which is frequently not fully or not correctly paid attention to in the literature. Even Boddewyn's (1961) otherwise rather critical review of standard perceptions of Taylorism fails to address this issue. Taylor's aim to re-educate managers as heartily cooperative comes close to later suggestions of behavioral organization research, e.g. McGregor's (1960) "theory Y" (similarly Argyris, 1962; Knowles and Saxberg, 1967), Herzberg's (1966) "Abraham-model", Etzioni's (1988) "I-and-we utility function" (similarly Margolis, 1982; Sen, 1990), Simon's (1993, 1997) concept of "bounded self-interest, benevolence and altruism in economics" (in degrees, also Williamson, 1998), Donaldson's (1995) "ethereal hand", Tomer's (1999) behavioral suggestions and more generally, suggestions by post-modern and critical management research on "radical humanism" (Alvesson and Deetz, 1996, p. 192; Bauman, 2001, p. 143). Bendix (1956, pp. 278-81, 286) and Merkle (1980, pp. 14-6)

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interpreted Taylor's suggestions on the heartily cooperative manager as a call for a new "management ideology" – the great mental revolution as Taylor called it himself. Nelson (1992a, pp. 5-6, 1992b, p. 240) suggested that Taylor invoked heartily cooperation as a defense against humanistic criticism or as a selling and consultancy proposition of Scientific Management.

All these suggestions, however, fail to unearth the deeper, analytical reasons why Taylor resorted to the call for the great mental revolution of managerial attitudes. They overlook the specific analytical purpose of the model of the cooperative manager *regarding the prevention of managerialist rule change*, i.e. the cutting of wages for workers once productivity rose in line with the implementation of Scientific Management. Possibly only Kanigel (1997, pp. 476-9) touched on this issue, albeit not from an economic perspective. In the following, I detail the deeper, analytical reasons why Taylor favored the concept of heartily cooperation for portraying managers in his theory (the "great mental revolution of managerial attitudes"). I relate this to his – with hindsight unsuccessful – attempt to prevent potential cooperation problems between managers and workers in non-economic but behavioral terms.

Undoubtedly, Taylor's proposals on the heartily cooperative manager are a highly significant element of Scientific Management. To characterize this idea as a mere "euphemism" for management control (Edwards, 1979, p. 98) overlooks the specific conceptual problems that Taylor tried to solve – unsuccessfully, as we know now – in his management theory. Similarly, behavioral organization research, as noted above, frequently tends to ignore this element and the positive image of human nature associations that can be linked to it. They claim a mechanistic, incomplete, low-trust or even dictatorial image of human nature for Scientific Management (Buchanan and Huczynski, 1997, pp. 340-3; Casey, 2002, pp. 72-3; Clawson, 1980, p. 247; Huczynski and Buchanan, 2007, p. 257; Mullins, 1999, pp. 49-52; Perrow, 1983, p. 90; similarly Barley and Kunda, 2000, p. 311; Drucker, 1989, pp. 188-90; Knowles and Saxberg, 1967, p. 32; Morgan, 1986, pp. 31-4; Nadworny, 1955; Pruijt, 2000, p. 440; Wrege and Greenwood, 1991, pp. 257-8). The textbook analysis of Scientific Management conducted by Payne *et al.* (2006, pp. 389-92) also overlooked cooperative elements of the managerial image of human nature and its analytical role in the conceptual set-up of Scientific Management. The reason for this may be that the apparently positive image of human nature of the manager does not easily fit conventional views of what Scientific Management is about. In this respect, accusations that Taylor subscribed to a too mechanistic, incomplete, low-trust or even dictatorial image of human nature are *doubly* unfortunate. They overlook, on the one hand, that Taylor modeled at least some organization members in holistic, moral, behavioral terms – but that, on the other hand, this led to practical implementation problems of his organization theory, as discussed below in more detail. Copely (1919), Wren (2005), Nelson (1992a, 1992b) or Nadworny (1955, p. vi) are here somewhat exceptions:

Crowning all the elements in the system [of Scientific Management] [...] was cooperation between management and the worker, "a mental attitude". [...] Obviously this was the most difficult to achieve (Nadworny, 1955, p. vi).

Nadworny touches on both points made above, that at least some organization members were portrayed as cooperative *and* that this was practically difficult to implement. Similarly argue Wren and Greenwood (1998, p. 138): "One lofty goal, Taylor's call for a

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“mental revolution”, [. . .]has seldom been attained”. The deeper reasons *why*, however, are not spelled out by Copely, Nadworny, Nelson, or Wren and Greenwood. The present paper here shows in the following, through institutional economic reconstruction, why Taylor resorted to the call for the great mental revolution and the model of the heartily cooperative manager and why this was doomed to fail.

Taylor departed from organizational economics when he drew on the concepts of the heartily cooperative manager and the great mental revolution of managerial attitudes. Various criticisms can here be advanced. From a behavioral, organization psychological point of view, a role-related modeling of cooperative attitudes of managers but not of workers is theoretically and empirically untenable. It can be speculated that Taylor’s behavioral approach to normatively conceptualizing – only – the manager but not the worker as the good, heartily cooperative person may reflect certain, one-sided class attitudes that Taylor cherished, being a member of the upper class and having been brought up in the Quaker tradition (O’Connor, 1996, p. 43; Wren and Greenwood, 1998, p. 134). More importantly, from the point of view of organizational and institutional economics, a cooperative model of the manager is *counter-effective*, both methodologically and theoretically: by invoking virtuous, cooperative character traits for managers, the model of economic man, and here especially the idea of self-interested choice, is abandoned. As a result, Taylor failed to analyze how potentially self-interested or even opportunistic managers could undermine cooperation with workers. North’s (1993) ruler-constituent analogy makes here a general, abstract point for institutional economics, which Taylor can be said to have ignored. In Taylor’s (1903, p. 31) own terms, he could no longer analyze cooperation problems in relation to a defective incentive logic of the situation. As discussed above, he had performed this kind of analysis so exemplarily well, from an economic point of view, for worker interactions through the concept of “systematic soldiering”.

The sincerity and emotive depth of Taylor’s moral appeal to managers to heartily cooperate goes unquestioned. Copely (1919, p. 9) compared these attempts of Taylor even to religious conversion. I argue that the strength of his appeal reflects that he sensed a severe conceptual problem in his theory, possibly even a self-contradiction in his otherwise rather economic analysis of organizational behavior. As discussed above, Taylor outlined in rather coherent economic terms how a single uncooperative, “lazy” employee could undermine interactions and cooperation among workers. If Taylor had examined managers for systematic soldiering, too, he would have found that a merely moral, behavioral approach to handle potential cooperation conflict did not systemically equilibrate managerial self-interest and worker self-interest. To induce managerial cooperation with workers by means of incentive-compatible organization structures is the more necessary since competitive pressures and self-interested choice is in considerable degrees imposed on managers by the firm’s organization structures (Fama, 1980, pp. 293-4) and by the constitutional, political, legal, and economic institutions of the market economy that enact and protect competition among firms (Wagner-Tsukamoto, 2005, 2007b).

In the end, Taylor’s expectation that managers could be trained to become effective moral agents turned out to be utopian. Quaker employers in the UK made a comparable experience around the same time (Wagner-Tsukamoto, 2008). A case study of them offers some even more disturbing insights in this respect since the moral attitudes of

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these *highly religious* Quaker *owner-managers* cannot be questioned as it possibly can be done for the employed managers (the “functional foremen” and “shop disciplinarians”) in the Taylorite factory. The attempt to control managerial self-interest through a moral, behavioral approach was unsuccessful in Taylor’s time, and it seem to be the case in the present time as well. Jones’s (2000, p. 53) findings on workers underline this; they mistrusted managers to create “inclusive cultures” in contemporary, Taylorist work settings. In Taylor’s time, actual implementation failures of Scientific Management finally confirmed that Taylor’s moral, behavioral appeal and the implied positive image of human nature of the manager did not prevent managerialism: Nelson (1992a, b, pp. 23, 239) and Goldberg (1992, p. 43) reviewed a number of historic cases, especially from 1909-1913, in which managers reneged on given wage promises (Cochran, 1968, p. 79). Copley (1919, p. 8) spoke in this regard of the “myopic greed” of managers when it came to appropriating and distributing gains that were generated by Scientific Management. Through applying the model of economic man – the models of “systematic soldiering” or even its behaviorally disguised version of “natural soldiering” – Taylor could have uncovered and prevented such instances of myopic, managerial greed. Worker discontent with (potentially) uncooperative managerial behavior, fuelled by actual occurrences of broken wage promises, grew so strong by 1910/1911 that strikes against Scientific Management resulted (Goldberg, 1992, p. 44; Wren, 2005, pp. 139-40; Nelson, 1992a, p. 13, 1988, pp. 23-4). The US Congress then summoned Taylor.

This leads back to the question of how far behavioral, sociological and psychological concepts can resolve cooperation problems. In “modern” interaction contexts in which family-type, socio-biological bonding and an unambiguous value consensus frequently have been eroded and in which the institutional structures of the market economy enforce competitive, “uncooperative” behavior (for larger, moral reasons, see Wagner-Tsukamoto, 2005, 2007b), the effectiveness of behavioral intervention is in doubt. Then, cooperation problems can be better resolved by treating them as a systemic condition but not as the human condition and even less so as a class-related or role-related reflection of the human condition. Only in pre-modern contexts, where a culturally homogeneous work force is encountered and managers are nearly intrinsically predisposed towards cooperation – Rowlinson’s (1988, pp. 391-2) analysis of Scientific Management in British Quaker firms is instructive – can the appeal for heartily cooperation succeed. But then, in contrast to Taylor’s proposals, Quaker managers also systemically committed themselves to Scientific Management by involving unions in the organization of manager–worker interactions (Rowlinson, 1988, pp. 386-7; Whitston, 1997).

*Taylor’s admissions before the US congress and new economic measures to prevent managerialism under Scientific Management*

In the previous sections, I pointed out that an economic reassessment of the positive, morally favorable image of human nature of the manager under Scientific Management was a rather frail component in Taylor’s theory. In the testimony before the US Congress, the chairman of the inquiring committee seemed to cut down to this very issue. He basically suggested to Taylor that a potentially self-interested manager (employer) could retreat at any time from wage promises given to workers:

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*The Chairman:* Would not your suggestion of cooperation on the part of the workman with the management (the management being the sole and arbitrary judge of the issue) be very much like the lion and the lamb lying down together with the lamb inside? [...]Mr Taylor, do you believe that any system of management induced by a desire for greater profit would *revolutionize the minds* of the employers to such an extent that they would immediately, voluntarily and generally enforce the golden rule [of hearty cooperation]? [...]Is it not true that Scientific Management has been developed with a desire to cheapen the production in order that there might be greater profits? (Taylor, 1912, pp. 152-3, emphasis added).

This argument of the chairman has to be read as a fundamental critique of the effectiveness of a behavioral organization approach that aimed at the “great mental revolution of managerial attitudes”, as Taylor put it, or the “revolution of managerial minds”, as the chairman of the inquiring committee stated it. The chairman seemingly suggested that the manager should have been modeled as economic man: who “cheapened production” and had a “desire for profits”. The chairman basically pointed out that the “promotion of own best interests”, which Taylor (1903, p. 23) had explicitly analyzed for worker behavior, should also have been analyzed for managerial behavior. Otherwise, interest conflicts among organization members remained unresolved: “The lion and the lamb” were naively expected by Taylor to peacefully “lie down together”, as the chairman put it.

On the one hand, Taylor seemingly agreed with hindsight that the implementation failures of Scientific Management were due to uncooperative managerial behavior. He admitted: “Nine tenths of the trouble comes from those on the management side in taking up and operating a new device (the Scientific Management program) and only one-tenth on the workmen’s side. Our difficulties are almost entirely with the management” (Taylor, 1912, p. 153). Apparently, Taylor realized his failure to successfully tame managers through the great mental revolution. In the figurative language of the chairman, managers actually remained “lions”. However, on the other hand, Taylor continued to misunderstand the deeper, methodical reasons why the implementation failures of Scientific Management had occurred in the first place. He tried to fend off the above criticism made by the chairman by suggesting that workers could counter–defect if managers broke wage promises:

The workman has it in his power at any minute, under Scientific Management, to correct any injustice that may be done to him in relation to his ordinary day work by simply choosing his own pace and doing the work as he sees fit. [...]In other words, injustice on the part of the employer would kill the goose that lays the golden eggs (Taylor, 1912, p. 152).

Taylor raised here two defenses. First, he suggested that under Scientific Management workers still had sufficient competency rights to counter-defect. Second, Taylor implied that managers would anticipate that they behaved as “rational fools” when breaking wage promises, realizing in time that they “killed the goose that lays the golden eggs”. Neither argument may hold up. Under Scientific Management, the scope of workers to (counter)–defect was considerably more limited than under previous management systems. Scientific Management restricted the competency rights of workers to organize their own work and to “choose their own pace”. Indeed, it highly standardized work performance and enforced strict output control (Taylor, 1903, 1907/1995, 1911). Also, the competency rights of workers were no longer protected by unions since Scientific Management had relegated unions, or at least aimed to do so (Wagner-Tsukamoto, 2003, 2007a; Wren, 2005, pp. 127, 243). In fact, such a one-sided

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concentration of competency rights provided managers with a considerable temptation to appropriate wage distributions that had been promised to workers.

The important question then was whether, over time, managers would consistently resist this temptation and anticipate that they would “kill the goose that lays the golden eggs” by breaking wage promises. Taylor continued, even at the point of the Congressional Hearing, to argue that this problem could be solved through the “great mental revolution of managerial attitudes”. Historical evidence shows that this was not the successful in early twentieth century USA. Nelson (1992a, p. 13) here made the point: “The managers cut the rates and the workers struck”. And it can be speculated that Taylor hope for managerial good-will and foresight has been generally rare in the industrial history of mankind.

The important insight that emerges in this connection from the protocols of Taylor’s (1912) testimonial is that he was summoned by the US Congress because of the inconsistent, asymmetric application of the model of economic man in his organization theory. In other words, the US Congress reprimanded Taylor for his too favorable image of human nature regarding managers, for modeling certain organization members as “naturally” hearty and cooperative. This thesis is derived from the critical inquiring line the chairman took when questioning Taylor, as for instance, quoted above.

There are numerous *economic* ways in which Taylor could have prevented managerial “defection”. To resolve this problem, promises of gains have to be safeguarded by incentive structures (Buchanan, 1975; North, 1990, 1993; Williamson, 1975; 1985). Trust or fairness or “heartily cooperation” is then approached as an institutional economic problem rather than as a behavioral, sociological or psychological one. Fama’s (1980) discussion of how to control managerialism proceeds similarly. Codetermination schemes between workers and managers could have been installed. For instance, Scientific Management could in this respect have granted unions certain competency rights on behalf of workers, collective bargaining could have been arranged, or at least employee representation plans (company unions) could have been set up. The Hoxie report from 1915 suggested this early on (Wren, 2005, pp. 243, 207). Williamson (1985, p. 34) and Mortensen (1978, p. 585) stressed such a stability-building role for unions in generating “industrial peace”, too. A jointly organized process of negotiations over contributions and distributions is thus set up, safeguarded by institutional economic structures, inside and outside a firm. Rowlinson’s (1988, pp. 386-7) analysis of Cadbury’s success in implementing Scientific Management by involving unions in wage negotiations also supports such an institutional economic rationale.

In his testimony before the US Congress, Taylor’s thinking finally seemed to move towards such an institutional economic approach to handle managerial opportunism:

The moment it becomes the object of both sides *jointly to arrive* at what is an *equitable and just series* of standards by which they will *both* be *governed*; the moment they realize that under this new type of cooperation [...]they can so enormously increase this surplus [profit] that there will be ample for both sides to divide [“mutual gains”] (Taylor, 1912, p. 151, emphasis added).

This proposal compares to Williamson’s (1985) concept of governance structures and their purpose to equilibrate potentially conflicting self-interests of organization members. Taylor’s remarks on “jointly arrived at, just standards that are to govern both sides” anticipate modern institutional economic thought (together with his concept of systematic soldiering). Early roots of institutional economics can here be

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traced in Taylor's work on organization. Unfortunately, before 1912, Taylor hardly approached managerialism in such an apparent institutional economic way. And it has to be said that even by 1912 Taylor did not fully realize how to instrumentally, heuristically apply the model of economic man in order to generate mutual gains by means of incentive-compatible structures that resolved potentially conflicting self-interests of organization members. He did not fully understand why and how opportunism – “systematic soldiering” – needed to be analyzed for *both* workers *and* managers. His continued argumentation against union involvement in a process of equilibrating interests between managers and workers reflects this (Taylor, 1912, pp. 149-53).

It was only after Taylor's death in 1915 that his followers began to more dramatically revise Scientific Management with regard to union involvement (Hoxie, 1915, p. 147; Nadworny, 1955, pp. 105, 111-19, 122-41, 144; Nyland, 1998, pp. 525-6). They then set up formal “checks and balances” for managerial behavior by involving unions in the institutional organization of management–worker interactions:

The best known of these changes was the reconciliation of Taylor's followers and union leaders that followed the engineers' formal endorsement of collective bargaining. The *practical importance* of this concession is *unclear* but it removed a major source of misunderstanding and demonstrated the appeal of Scientific Management among union leaders once its anti-union implications were muted (Nelson, 1992a, p. 15, emphasis added).

Nadworny (1955, pp. 144-7) argues similarly. From the point of view of institutional economics, the *practical importance* of bringing unions into the organization of worker–manager interactions is very much clear: This systemically constrained managerial opportunism, specifically the temptation of managers to appropriate gains that had been promised to workers. Only largely after Taylor's death, unions were given such decision rights in processes over wage negotiations and wage distributions. As discussed, before 1912, Taylor aimed to control managerialism through a moral, behavioral approach that was grounded in a rather favorable image of human nature of the manager and here especially the humanist portrayal of the manager as the heartily cooperative, naturally good person (“the great mental revolution of managerial attitudes”, as Taylor referred to it, or “religious conversion”, as Copely called it).

## Conclusions

In basic, this paper has taken a Hegelian perspective to undermine some common sense perceptions regarding the image of human nature of Taylorism. As Marcuse (1960, pp. vii, x) wrote in *Reason and Revolution*: “Hegel defines: “Thinking is the negation [...] of that which is immediately before us”. For to comprehend reality means [...] to break down the self-contentment and self-assurance of common sense”. The present article has revealed the multifaceted image of Taylor's portrayal of workers and managers, which is commonly and in many textbooks of the past not associated with Scientific Management. In the Scientific Management approach, neither workers nor managers live up to a simplistic, one-dimensional image of human nature as is so often linked to Taylorism.

Regarding worker behavior, at least four dimensions of an image of human nature can be made out: competence building, insufficient mental capacity, systematic soldiering and natural soldiering. The former two reflect human capital utilization in the firm and issues of theory building and practical intervention. As discussed, the idea of

insufficient mental capacity was an unnecessary variable for human capital utilization under Scientific Management. To a degree, it also reflects on the behavioral idea of bounded rationality, which was not further discussed in this paper but which has made much, possibly questionable inroads into economic thinking (Wagner-Tsukamoto, 2003). The idea of soldiering reflects the idea of self-interested, even opportunistic behavior. This idea is heuristically useful in institutional economics for testing out incentive structures for their incentive compatibility. As Williamson (1985) so clearly pointed out, incentive compatibility implies that potentially conflicting self-interests of interacting organization members have been realigned through incentives management. The idea of systematic soldiering exemplarily captured such a test function regarding incentive compatibility but less so Taylor's idea of natural soldiering, which referred to inborn features of work-avoiding behavior. Although the idea of natural soldiering still allowed Taylor to apply the model of economic man, it camouflaged the *heuristic, methodical* nature of the model of economic man for the purpose of theory building and practical intervention in the tradition of a modern organizational and institutional economics. And it invited much unnecessary criticism of behavioral organization research, Taylor becoming a humanist strawman for his apparently negative image of human nature. Taylor may have been well advised in this respect to stick to the idea of systematic soldiering only, which so closely mirrors concepts of systemically induced opportunism in the New Institutional Economics.

Regarding managerial behavior, the paper has identified at least three dimensions along which Taylor portrayed managers. Regarding work performance, a theoretical, practical model of human capital was touched upon that saw managers in functionally specialized roles ("the functional foremen"; for more details, see Wagner-Tsukamoto, 2003). From a heuristic perspective, Taylor at least implied that managers showed an inclination to managerialism. His remarks that wage increases for workers needed to be permanent hint at this. But instead of applying the model of economic man and concepts like systematic soldiering to test out managerial behavior for opportunism, he resorted to the model of the trustworthy, heartily cooperative manager (and the related "great mental revolution of managerial attitudes"). In this way, he hoped to close a conceptual gap in his theory. But by applying the image of the cooperative manager as a conceptual construct, he transgressed from organizational economics into behavioral organizational research – but not with much success. And in this respect, the paper has identified an important methodological disconnect and asymmetry between Taylor's model of the worker and the manager. Ultimately, Taylor was reprimanded by the US Congress – through the way the chairman inquired Taylor – for this disconnect and the related over-favorable image of managerial behavior as the naturally good, heartily cooperative person. Such an image of human nature prevented him from methodically testing out managerial behavior for socially detrimental effects of self-interested choice in the context of incentive-incompatible organization structures, which undermined mutual gains as interaction outcome.

This issue, of how to methodically portray organization members as self-interested in organizational economics, is, of course, not only interesting from a methodical, theoretical perspective but also from a *practical* one. Ultimately, the model of economic man is applied to generate socially desirable, practical outcomes such as mutual gains (Figure 1). Even contemporary management education, management practice, and management consultancy can in this respect much learn from the historic case study of

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implementation problems of Taylorism some 100 years ago since issues of economic governance of the firm have remained high on management agendas.

The criticism of the US Congress is especially relevant in so-called “modern”, pluralistic interaction contexts. Such a context was encountered in Taylor’s time because of a high ethnic and cultural mix on the shop floor, which was caused by the immigration of shop floor workers to the USA from many different countries and by the recruitment of former slaves and farm workers (Wagner-Tsukamoto, 2003, Chapter 7; Wren, 2005, p. 259). Such ethnically diverse and pluralistic interaction contexts have become even more prevalent and relevant in our times of globalizing social exchange. In this respect, the criticism of the US Congress can be directed at behavioral organization research that tries to solve interaction problems by solely focusing on the question of human nature and the image of human nature in organization research. An implication is then that organizational economics may have to be prioritized over behavioral organization research when it comes to the resolution of interaction conflict. The economic approach easily tolerates pluralism as an interaction condition since in theoretical and practical perspectives it focuses on concepts of incentive structures, capital exchange and mutual gains and from a methodical perspective it is grounded in the ideas of economic man and interest conflicts. Thus, economics accommodates pluralism as an interaction condition, and this largely happens as an “accidental by-product”, namely by theoretically analyzing and by practically intervening with organizational behavior in *non-behavioral* terms and by heuristically grounding theory-building and practical intervention in models of self-interested choice and interest conflict. This approach makes little demands on value structures and value homogeneity among agents.

Many firms encountered such modern, pluralistic, de-traditionalized contexts as early as the nineteenth century. Firms in the USA and Europe then experienced dramatic changes such as rising demand for industrially produced goods, growth of the work force, the replacement of the owner manager by professional managers, the dispersion of ownership among shareholders and the beginning of the growth of firms. The firm no longer resembled the workshop or small family business, which could be effectively run through behavioral intervention. In such contexts, interaction problems may be generally difficult to resolve in a behavioral manner. Taylor’s organization program demonstrated this early on by running into problems because of a too positive, behaviorally grounded image of human nature of the manager. However, Taylor’s misunderstanding may not be exceptional. As this paper has hinted, wider claims can be made regarding a conceptual, methodological misunderstanding of the model of economic man in organizational economics (Wagner-Tsukamoto, 2003, 2007a).

Future research can examine whether organization researchers like Coase, Donaldson, Etzioni, Herzberg, Knight, Mayo, McGregor, North, Sen, Simon, or Williamson, whose very significant contributions to organizational and institutional research go unquestioned, may in certain respects have fallen for similar misunderstandings as Taylor regarding the portrayal of human nature in organization and management studies.

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