The surprising consequences of extrinsic motivation

The Interaction between Extrinsic and Intrinsic Motivation: a Literature Review

By Louise Christina Vang Edwards (ll83358) & Louise Ørum Johansen (lj83707)
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Aarhus School of Business
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ABSTRACT

A motivated workforce is crucial for the success of any company. Extrinsic rewards, typically bonuses or pay-for-performance schemes, are commonly applied in businesses. However, numerous studies on the subject have shown that extrinsic rewards can have an adverse effect on intrinsic motivation. The purpose of this paper is to make a literature review on the subject to determine how extrinsic motivation affects intrinsic motivation and what implications this relationship has on how managers can best motivate their employees.

The review has been carried out using an extensive search string focusing on extrinsic and intrinsic motivation or rewards. This search has been carried out in the two most relevant databases and additional material has been discovered through other researchers’ reference lists. Since the detrimental effects of rewards are unknown to many, a historical point of view will be taken in the beginning to see how both the concept of intrinsic motivation and the research on the negative effect of extrinsic rewards has evolved.

Many people, both managers and researchers, believe that rewards and punishments are the most efficient way to motivate. Their perspectives and reasoning will be discussed to provide a better understanding of the pervasiveness of rewards in society at large. However, the focus will be on identifying the more unexpected negative effects of using rewards. More specifically it will be discussed how rewards can crowd out intrinsic motivation; changing people’s focus, devaluing the task it is given for, being experienced as controlling, only working short-term and changing the people that are rewarded.

Based on this review it is concluded that the relationship between extrinsic and intrinsic motivation is interactive and very complex and that various conditions determine whether a detrimental effect will occur or not. These conditions include expectancy, contingency, causality and culture among others.

Even when the conditions have been taken into consideration, there still appears to be inconsistent findings in the research on the subject. It is found that the main reasons for this ambiguity lie in the methodology applied by the different researchers. In particular, how they have chosen to measure intrinsic motivation seems to be a strong predictor of whether a particular experiment finds a negative effect of rewards on intrinsic motivation or not.

Despite research inconsistencies and conditions, it is obvious from this review that contingent rewards have a detrimental effect on motivation, if intrinsic motivation was
there to begin with. This conclusion is, among others, built on the result of the largest meta-analysis to date, including 128 studies, where the effect was confirmed.

It is important for managers to comprehend these findings, as intrinsic motivation brings with it many positive qualities, making the employees more equipped to do a good job in today’s knowledge-intensive society. Jobs in the 21st century are heuristic and complex in nature, calling for creativity and dedication to the task, which all requires intrinsic motivation. Nevertheless, many companies still rely heavily on contingent extrinsic rewards, despite their deficiencies. There are multiple reasons for this; it used to work, it is an easy and simple way of motivating, and many managers are simply not aware of any negative side-effects.

A new approach to motivate employees is needed and the conclusion in this paper is that the starting point is that managers need to change their entire approach; rather than trying to impose motivation from the outside, managers must start focusing on creating the best possible conditions for the employees to motivate themselves. More specifically, managers should focus on giving the workers a sense of autonomy, mastery and purpose. In other words, give them more responsibility and freedom, and make sure there is a sense of meaningfulness to all tasks. In addition, the issue of money should be taken off the table; this means that companies must pay enough in base salary, so that the employees do not have to worry about money, but can focus on their jobs instead.

The fact that business leaders do not know or understand the potential negative effects of extrinsic rewards is a major issue and further research is suggested which may help close this gap. First and foremost more field experiments need to be conducted. Next comparisons between companies focusing on extrinsic rewards and those that focus on intrinsic motivation must be made to clarify any difference in performance. Research must also elucidate what happens when companies stop using rewards and start implementing some of the alternative motivators suggested above.
INTRODUCTION

“Given today’s economy, a motivated workforce represents both a competitive advantage and a critical strategic asset in any work environment”
- (Tremblay et al., 2009, p. 213)

It is no longer questioned that motivation plays an important part in influencing employees’ performance (Buelens et al., 2010). Intuitively, it can be understood that being driven and engaged will support a higher work effort. Therefore, it is clear that motivating employees is an important challenge facing all types of managers today.

Endless theories over the past 80 years (Buelens et al., 2010) have attempted to map out how motivation works and what steps managers need to take in order to inspire an effective workforce. Theories have stretched from wanting to determine universally applicable drives, like Maslow’s hierarchy of needs and Alderfer’s ERG theory, to creating practical models of do’s and don’ts within motivation, like Locke’s goal-setting theory or Vroom’s expectancy theory (Buelens et al., 2010).

In business, however, it seems that one particular motivational instrument is used excessively, namely money. Evidence of this can clearly be seen by the extensive use of bonuses, provisions and stock options in companies today; money is, and always has been, the traditional go-to motivator (Dewhurst et al., 2010).

But how well do these financial carrots and other extrinsic rewards really work to stimulate today’s workers? Several motivation theories have already questioned whether or not financial incentives can really work as long-term motivators; such as Herzberg’s two-factor theory and Hackman & Oldham’s job characteristic model. Herzberg’s hypothesis is that money is an important hygiene factor that needs to be fulfilled in order for the employee not to feel dissatisfaction. However, Herzberg holds that money does not work as a motivator, at least not in the long-run (Buelens et al., 2010).

If this is true it holds some grave implications for many businesses’ incentive systems, but this might not be where the story ends. Since the 1960’s a new stream of research has tried to clarify how externally controlled rewards affect motivation, and to their own surprise they found that under several circumstances rewards lead to a direct decline in motivation (Deci & Ryan, 1987; Lepper & Greene, 1978; Kohn, 1999; Pink, 2010). Since then many empirical studies have supported this theory; that extrinsic rewards can crowd out intrinsic...
motivation and can cause several other negative effects. Consequences are particularly grave when the task at hand calls for creativity (Amabile, 1996) or complex heuristic thinking (Pink, 2010; Glucksberg, 1962; McGraw, 1978).

Even with this strong empirical background the effect still appears to lack support in mainstream organisation theory and in businesses. This seems puzzling and is why we wish to explore this motivational effect further, diving into the research on the subject with the aim to discover the true interaction effect between extrinsic rewards and intrinsic motivation. It is our belief that this is a complex part of motivational theory where conflicting perspectives and opinions exist, and where different research has lead to widely inconsistent conclusions. In having a thorough look at the research and writings on this subject we hope to discover what lays the foundation for these disagreements and to identify what implications the findings have for future research and for businesses.

PROBLEM STATEMENT

“To many organizations [...] still operate from assumptions about human potential and individual performance that are outdated, unexamined, and rooted more in folklore than in science”

-(Pink, 2010, p. 9)

In 2010 Dan Pink authored the New York Times bestseller “Drive: The Surprising Truth about What Motivates Us”. This book is a call to action for all business leaders to understand that in today’s knowledge intensive work environment, extrinsic rewards are not only fruitless but directly harmful to motivation (Pink, 2010). The release and success of this book shows us not only that the topic is very current, but that there are also unresolved matters within this field with important implications for today’s businesses. This was what sparked our initial interest in the topic.

For business leaders to understand how to incentivise their employees and ultimately foster an environment where high motivation flourishes, it is our hypothesis that they need to understand the effects of extrinsic motivation and intrinsic motivation and how the two interact.

This leads us to the main problems statement of this paper:

How does extrinsic motivation affect intrinsic motivation according to the literature on the subject?
To answer the problem statement the following questions will be used:

1. How has the research on intrinsic and extrinsic motivation progressed until now?
2. How pervasive is the use of extrinsic rewards?
3. What do the proponents of extrinsic rewards believe?
4. What is believed to be the consequences of extrinsic rewards?
5. What is the interaction effect between extrinsic rewards and intrinsic motivation?
6. Where does the disagreement in this field of motivation stem from?
7. What are the implications for businesses and further research?

Outline

To explore these questions the main focus will be on studying the existing literature. This approach arises from an interest in understanding what theoretical ideas are already out there and how this branch of motivational theory has developed. Therefore, no empirical research has been conducted for this paper.

This paper will, consequently, be a theoretical look at the relevant empirical studies that have already been carried out. Creating this review, we believe, is relevant as this will create an overview of the subject, giving both a voice to the research that believes in the negative effect of extrinsic motivation and those that see extrinsic motivators as complementary to intrinsic motivation. While also providing insights targeted at businesses and suggesting further research.

To answer our research question we will first look at the historic roots of intrinsic motivation and the first signs of a detrimental effect of extrinsic motivation. After having been brought up-to-date on the subject, we will take a look at how popular the use of extrinsic means is in society at large. Understanding the pervasiveness of the use of rewards and other extrinsic motivators, we will then see who the proponents are. Looking then at the opposing side, we will go through the negative consequences of extrinsic rewards, that different researchers have highlighted. Having heard from both sides, a discussion on what kind of relationship exists between extrinsic rewards and intrinsic motivation will follow. Then an attempt to find out where any disagreement in the research springs from will be made. Finally, the findings will be used to note the implications for businesses and for future research.
Delimitation

Motivation, seen as something that drives us, is relevant to many of life’s domains; however, we wish to focus on motivation in a work context. This paper is interested in uncovering how businesses motivate their employees and whether or not their approach fits with the research findings in this area. This business focus will be carried through the entire paper including the suggestions for further research.

Despite this wish to focus on motivation solely from an organisational perspective, many of the studies referred to in this paper have been carried out in places like laboratories and kindergarten classes. Even though these studies give us great insight into the concept of motivation in general, and the effect of extrinsic rewards in particular, it is important to note that these findings cannot be directly applied to an organisational setting, and thus must be interpreted carefully in relation to this paper.

Most of the researchers in the field of behaviourism and social psychology that we have used in this bachelor assignment have been American; ergo most of the studies have been carried out in the United States. As a result, it is clear that this paper is somewhat biased towards American research. The findings in this paper therefore need to be considered in this light.

In this paper, we would like to give an objective insight into the subject of intrinsic and extrinsic motivation; however, there will be a bias towards studies showing a detrimental effect of extrinsic motivation on intrinsic motivation. Since these findings are the most puzzling, surprising and the least accepted in the realm of business, this is where our main interest lays.

When deciding which studies and findings to include in the report, we have chosen the material most discussed, supported and cited within the field of extrinsic and intrinsic motivation. Therefore, there are several very interesting findings not mentioned, because they stood somewhat alone and unconfirmed.
Definitions

Motivation
The study of motivation encompasses the science of understanding ‘why people behave the way they do?’ (Buelens et al., 2010). In simple terms motivation can therefore be described as the will to perform (Brooks, 2009). This definition paints motivation as a type of internal force or drive that affect the actions and efforts of a person. This description might not give us the full story though; if we look at Pinder’s definition we get both a more elaborate description and a definition framed particularly with work motivation in mind (Pinder, 1998). Pinder states that motivation is “a set of energetic forces that originate both within as well as beyond an individual’s being, to initiate work-related behaviour, and to determine its form, direction, intensity and duration” (Pinder, 1998, p. 11). The strength of this definition is that it distinguishes between two types of motivation: motivation from within, and motivation from beyond the individual, also referred to as intrinsic and extrinsic motivation (see definitions below). This definition also tells us that motivation determines more than simply whether we are willing to do something or not, but also the form, direction, intensity, and duration of our effort. To put this definition into a context, it can be inferred that a minimally motivated worker might be willing to do his or her job; however, the lack of motivation will affect the way the work is carried out negatively. In this paper this is the definition of motivation which will be considered.

Extrinsic Motivation
The distinction between extrinsic and intrinsic was first made popular by Herzberg in 1959, when he divided work rewards into the two different categories (Kanungo & Hartwick, 1987).

When a person is extrinsically motivated the person is driven to perform his or her task because it leads to some separate consequence (Deci & Ryan, 2008). For a person to be extrinsically motivated then an instrumentality between an activity and some separate reward is required. This means that motivation is derived not from the activity itself, but rather from the extrinsic consequences to which the activity leads (Gagné & Deci, 2005). In essence “the clearest examples of extrinsically motivated behaviours are those performed to obtain a tangible reward or to avoid a punishment” (Deci & Ryan, 2008, p. 15). The tangible rewards here can either be of a financial, material or a social character, all having in common that they originate from the environment.
Intrinsic Motivation
When a person is intrinsically motivated the person is motivated to perform his or her task because the activity in itself is interesting and spontaneously satisfying (Deci & Ryan, 2008). “One who derives pleasure from the task itself or experiences a sense of competence or self determination is said to be intrinsically motivated” (Buelens et al., 2010, p. 227). Intrinsic motivation arises from a psychological reward that comes from within and not as a result of external forces (Buelens et al., 2010). To be more specific, it can be said that any motivation, that arises from the individual’s positive reaction to qualities of the task itself, is intrinsic. Intrinsic motivation can be experienced as interest, involvement, curiosity, satisfaction or positive challenge (Amabile, 1996). When people are motivated because the activity is valued for its own sake and appears to be self-sustained they are said to be intrinsically motivated (Calder & Staw, 1975b).

To distinguish between the two it helps to think of the source of the motivation; if the source is outside of the task itself, i.e. from the environment, it is extrinsic, whilst if it comes from within the motivation is intrinsic (Amabile, 1996).

Divergence
The above mentioned definition of extrinsic and intrinsic motivation is not unchallenged, since another definition exists, which focuses on who is administering or mediating the reward as opposed to focusing on the relation between the activity and the reward. Self-administrated rewards are intrinsic while rewards from others are extrinsic (Kanungo & Hartwick, 1987). This definition, even though it can often be used interchangeably with the first, will not be used in this paper.

Even when the definition is not debated there might still be points of contention and experiments have shown that researchers still disagree on how to categorise various rewards (Kanungo & Hartwick, 1987). It is important to take these disagreements into consideration when comparing different researchers’ conclusions, as their empirical studies might rely on different definitions of what constitutes intrinsic and extrinsic rewards.

Extrinsic Rewards & Constraints
In this assignment extrinsic rewards can mean several different things, and anything that constitutes a reward to the subject may be included. This includes money, praise, stock options, candy and so on.

Furthermore, extrinsic constraints not only include tangible rewards or punishments, but can also be threats, surveillance, deadlines, orders, competition, external evaluation and so on. So even though the majority of studies mentioned throughout this paper use tangible
extrinsic rewards, this should not lead to the misperception that extrinsic rewards are the only external constraint that can cause a reaction.

However, when mentioning extrinsic rewards in this paper, unless something else is specified, it will be referring to a monetary reward that is contingent upon the fulfilment of some task; the so called ‘if-then’ rewards.

Furthermore, when the expression ‘the effect’ is used, we are referring to the negative effect of extrinsic rewards on intrinsic motivation.

METHOD OF ENQUIRY

“The literature review is integral to the success of academic research”
-(Hart, 2003, p. 13)

The origin of this literature review was Daniel Pink’s book “Drive: The Surprising Truth about What Motivates Us”. This book triggered the initial interest in the subject and thus it was a natural starting point. The reference list was used to identify significant authors on the subject of extrinsic rewards and intrinsic motivation. Among others, Pink’s book led us to Deci, Ryan, Lepper and Grene, who stood out as significant researchers in the field. In search of the sources cited Aarhus School of Business’s library website was mainly used.

The next step was an extensive search in the Business Source Complete database. The main search string used was:

```
((((((intrinsic AND extrinsic) AND (motiv* OR reward*))
OR (AB ((intrinsic AND extrinsic) AND (motiv* OR reward*))))
OR (((internal AND external) AND (motiv* OR reward*))
OR (AB ((internal AND external) AND (motiv* OR reward*))))
AND (((motivation)
OR ((DE "EMPLOYEE motivation"
OR DE "EMPLOYEE competitive behavior"
OR DE "INCENTIVES in industry"))))))
```
This search string is the result of multiple individual search strings that were combined. The first search string, done as a standard search, was for articles including both the terms intrinsic and extrinsic and at least one of the two words; motiv* or reward*. The asterisk is used to make sure that any variation of the word will be included, which ensured that relevant literature was not excluded because a different form of the word was used. Motiv* was used since the general issue of interest was motivation and reward* was used because we were interested in particular in how rewards affect motivation. Furthermore, we believed that reward was a good, covering expression for external constraints, and the term most commonly applied by researchers. As a result of our own experience in the course Organisational Behaviour we use the distinction ‘extrinsic’ and ‘intrinsic’ motivation and since we were interested in the relationship between the two both were included in the search.

The second search string was identical to the first one, except that this time the search was in the abstract. The next step was a combination of the first two search strings using OR to find the articles that include any of the terms, to get a wide starting point. At this early point in time we wanted to make sure we included researchers who used a different terminology, and thus we included the words ‘external’ and ‘internal’ in an equivalent search string.

The Thesaurus was then used to see if other words should be included. A search for the broad term ‘motivation’ was made in the Thesaurus and led to the term ‘EMPLOYEE motivation’ as well as the two narrower terms ‘EMPLOYEE competitive behavior’ and ‘INCENTIVES in industry’. Thus the next search string included both motivation and the three newfound terms, again using OR. We are aware that the spelling of behavior is American and that this may have some implications, however, it was used since it was the spelling of the Thesaurus.

The final search string was a combination of the search strings just described, using AND, giving a total of 580 articles. Since the aim was a comprehensive literature review, a qualitative examination of all of these was made. First, the ones with titles indicating that they were not relevant to this specific paper were discarded and subsequently the abstract was checked for relevance as well. This reduced the list of articles to 47.

Since motivational theory can be seen as a psychological issue, it was deemed appropriate to do an equivalent search in a database of psychology articles, in this case PsycARTICLES via CSA was used. This search resulted in 41 articles; however, not all of these were available to us in their full form.
These three steps nicely sum up the preliminary literature search; i.e. sources from Dan Pink’s “Drive: The Surprising Truth about What Motivates Us”, and searches in Business Source Complete and CSA.

Later we have found sources as it became apparent from the literature already reviewed that they were of importance to this paper. Examples of this are de Charms, whose name repeatedly appeared especially in the early literature, and Amabile, who is mentioned in multiple articles. It was obvious at an early point in time that Deci’s writings have dominated this field and his writings have thus become a major supply of sources. Lepper is another prominent researcher in the field and so many sources have been found in his reference lists. Kohn and Pink have proven very helpful in finding sources since they both focus primarily on bringing forth the findings of other researchers and because both their books are written recently and therefore are more up-to-date.

When the time came to find proponents of using extrinsic rewards, we had some difficulties. One of the reasons for this could be that the positive effects of rewards on performance are taken for granted to such an extent that few researchers have commented on it directly. Another reason could be that many of the proponents do not work with a distinction between intrinsic and extrinsic motivation, so their articles would not be included in our searches in Business Source Complete and CSA. Altogether, this made it difficult for us to find research that could offer a contrast directly with the studies that claim that extrinsic rewards are detrimental to intrinsic motivation. However, we were able to find some appropriate sources for the paper through the literature already in our possession.

Furthermore, two text books from the course Organisational Behaviour in 2010 and 2011 respectively have been used in order to support a basic understanding of motivational theory. Finally, videos from TED and RSA were used for inspiration.

VIEWS ON MOTIVATION

“An important observation is that two people may claim that they are motivated, although their motivations may differ in direction, intensity and persistence”

- (Buelens et al., 2010, p. 163)

Motivation is not a very tangible concept, and this intangibility may account for why the concept is perceived in many different ways. While some talk about how much a person is
motivated, others look at *increases in output* and judge this to be the ultimate indicator of motivation, while others again talk about *different types* of motivation.

In organisational theory there is a distinction made between the direction, intensity and persistence of motivation (Buelens et al., 2010). The direction refers to different types of motivation like extrinsic and intrinsic. The intensity of motivation here refers to the strength of the response once direction is chosen. Finally persistence refers to the longevity of motivation, which is whether the person is motivated in the short-run or in the long-run (Buelens et al., 2010).

Even though there is some agreement that the mentioned factors are all important, this does not mean that researchers agree on where the main focus should be. Most theories of the past have focused primarily on the amount of motivation, either ignoring the different types or believing that more is always better. An example of this is Porter & Lawler, who assumed an additive relationship between motivation types when developing their expectancy theory model (Brooks, 2009; Deci & Ryan, 2008). However, since the late 1960’s the amount of research questioning this approach has grown.

These different perspectives might very well account for some of the differences in how research on motivation is carried out and the subsequent differences in results. In this paper a special focus will be placed on what type of motivation is taking place and to some extent also the persistency of that motivation.

**BACKGROUND: INTRINSIC MOTIVATION & THE EFFECT**

“In an echo of what Harlow discovered two decades earlier, Deci revealed that human motivation seemed to operate by laws that ran counter to what most scientists and citizens believed”

–(Pink, 2010, p. 8)

In 1890 William James was one of the first psychologists to begin grasping the concept that would later be known as intrinsic motivation. He claimed that attention is dependent on interest, and that a person will choose behaviour based on such interest. However, it was Woodworth who was the first to actually create a theory based on intrinsic motivation in 1918. This theory suggested that even though an activity was initiated because of an extrinsic motivation, it could become intrinsically motivating. Furthermore, Woodworth proposed that activities undertaken due to intrinsic motivation would be more effectively
carried out (Deci & Ryan, 1987). In 1950 Harlow was the first to use the actual term ‘intrinsic motivation’, as he showed that monkeys performed better when intrinsically motivated compared to when they were extrinsically motivated (Harlow, 1950).

Despite the somewhat groundbreaking work of Woodworth and Harlow little follow-up was done on intrinsic motivation, the reason for this could be that behaviourists such as Thorndike and Watson dominated the field at the time (Deci & Ryan, 1987).

Drive Theory & Its Limitations

In 1943 Hull, another behaviourist, published his drive theory and thus introduced the next big motivational theory. Hull argued that there are four primary drives of behaviour; hunger, thirst, sex and the avoidance of pain. According to drive theory all behaviour aims at reducing one of these drives, except if it is caused by secondary reinforcement. Secondary reinforcement is when an otherwise neutral stimulus is paired with a primary reinforcer and the result is that the neutral stimulus has the same effect as the primary reinforcer (Hull, 1943).

However, the limitations of drive theory had actually been discovered before the actual formulation of the theory, when Dashiell in 1925 discovered that rats chose to explore unknown areas over food (Dashiell, 1925). Even more obvious deficiencies were established in 1930 by Nissen when rats were willing to cross an electric grid for the chance to explore a new place (Nissen, 1930). The results of this experiment were incompatible with drive theory since the rats chose to cause themselves pain in order to fulfil a need that was not even defined by the existing theory. Welker confirmed the findings when he extended them to also apply to chimpanzees in 1956 and Montgomery revealed that the opportunity to explore something new also worked as a primary reinforcer, in that it could be used to reinforce other responses (Deci & Ryan, 1987).

Extending Drive Theory

Instead of exploring intrinsic motivation as an explanation, researchers attempted to extend the drive theory in order to accommodate the unexplained results. The first explanation revolved around the concept of anxiety avoidance. Anxiety is considered to be a state which one would want to reduce as an extension of the drive to avoid pain (Deci & Ryan, 1987). However, this explanation had some major flaws; first, Harlow had shown that the exploration was connected with pleasurable feelings of excitement and interest, and not fear or pain and second, White argued that if anxiety was provoked by the novelty then the
natural response, according to drive theory, would not be exploration but rather avoidance (Deci & Ryan, 1987; White, 1959).

The second attempt at an explanation within the scope of existing drive theory was secondary reinforcement. It said that if exploratory behaviour was continually paired with the reduction of a primary drive, the behaviour itself would eventually become a secondary reinforcer (Deci & Ryan, 1987). Butler, however, proved that exploration operates more like a primary reinforcer, since his experiments showed that re-pairing with a primary drive was not necessary for the effect of exploration to persist (Butler, 1953).

When it proved impossible to fully explain the findings through either anxiety reduction or secondary reinforcement, researchers moved on to naming additional drives. Montgomery called it the exploratory drive, whilst Butler used the term ‘a drive for visual exploration’. Others yet named it a boredom drive, and Isaac used sensory drive (Deci & Ryan, 1987).

In 1959 White criticised the attempt to simply name additional drives. Basically, any new drive would have to have the same functional characteristics as the original primary drives; one of the most important features being that behaviour always aims at reducing the drive (White, 1959). This would not hold true for an exploratory drive, since Montgomery and White himself (White, 1959; Montgomery, 1954) had already proved that “animals seek out stimuli that would, by the drive account, increase the exploratory drive” (Deci & Ryan, 1987, p. 17). All in all, no variation or extension of the drive theory could account for the exploratory behaviour of the animal subjects.

The Adverse Effect is Discovered

Around the same time Festinger started to pave the way back to research on intrinsic motivation. He left the animal laboratory and started by looking at how rewards can affect attitude through rationalisation. Attitude would later become a common measure of intrinsic motivation. In 1957 Festinger introduced his cognitive-dissonance theory which was built on the assumption that people are always trying to reduce dissonance or incongruity between stimuli (Festinger, 1957). The easiest way to explain the theory is with Festinger and Carlsmith’s “forced-compliance” experiment. The subjects were all asked to do a dull task and afterwards to tell a prospective subject that the task was actually interesting. Some of the subjects were paid $1 and some were paid $20 for this recommendation of the task. The ones who received only $1 experienced high dissonance, and thus they attempted to reduce this dissonance by producing a more favourable attitude towards the task. The group that received $20 experienced lower dissonance, since the money was considered a
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sufficient justification for their behaviour, and so they did not need to adjust their attitudes towards the task. In other words, when a person is asked to perform an unattractive task, or in Festinger’s terminology a counterattitudinal act, dissonance will be experienced unless there is another external justification. The greater the compensation is, the less dissonance follows and vice versa. This means that a low reward for a counterattitudinal act will produce a more positive attitude towards the task as a form of justification, whilst a sufficiently high reward will not affect the initial negative attitude (Festinger & Carlsmith, 1959; Kruglanski, 1978).

Contrasting to Festinger, Bem suggested that people do not have an initial attitude towards something; rather they derive their attitude from their own behaviour in relation to that something. So when looking at the “forced-compliance” experiment Bem states that instead of starting with a perception of the task at hand as counterattitudinal and so experiencing dissonance, the subjects first form their attitudes after the actual behaviour. The behaviour was the same for all subjects (they gave the recommendation), but the attitude, formed because of it, differs with the amount of the reward. If the reward is low the person assumes that the task was interesting and that this was the reason for participating in the behaviour in the first place. Whilst if the reward is high, it is taken for granted that the reward was always the reason for the behaviour. In this sense, Bem suggests that people rationalise their own behaviour in the same way as they do that of others, by finding the most logical explanation for it. This theory was named self-perception (Kruglanski, 1978; Bem, 1965; Bem, 1967).

Rewards Effect on Performance

In 1961 Miller set out to prove the positive effect of rewards on performance in her dissertation. Nevertheless, the results of her experiment showed just the opposite, namely, that those who were rewarded for the task showed inferior performance to those who did not receive a reward (Kohn, 1999). Glucksberg found concurring results the following year when he conducted an experiment and it turned out that rewards prolonged the time it took the participants to solve a problem (Glucksberg, 1962).

In his book “Personal Causation” from 1968, de Charms set up a hypotheses regarding intrinsic and extrinsic factors based on research conducted by Harlow. It stated that “with regard to intrinsically preferred tasks, the addition of extrinsic rewards may reduce task motivation rather than enhance it” (de Charms, 1968, p. 329). This is due to the fact that individuals under such circumstances may perceive their behaviour as being controlled by the reward. This hypothesis can be seen as a starting point for subsequent research regarding the intuitively puzzling effect of extrinsic rewards on intrinsic motivation.
In the early 1970s multiple reports were published that confirmed both the findings of Miller and Glucksberg as well as de Charms’ hypothesis. Spence found that children rewarded with candy got fewer right answers in her experiment, than the non-rewarded children in the control group. Viesti found that there was a significant difference between the performance of students who were paid and those who were not, and when he doubled the amount of the reward the result stayed the same; unpaid students performed better than paid ones. Deci, McCullers & Martin, and Kruglanski et al. found similar results in 1971 (Kohn, 1999).

Rewards & Intrinsic Motivation

In 1973 Lepper, Greene and Nisbett introduced the overjustification hypothesis; “a person's intrinsic interest in an activity may be decreased by inducing him to engage in that activity as an explicit means to some extrinsic goal” (Lepper et al., 1973, p. 129). It was an extension to Festinger and Bem’s findings, that people need some kind of justification for their behaviour. However, Lepper et al. brought in the addition that the extrinsic reward must be explicit for it to be the justification of the behaviour. Furthermore, the hypothesis assumes that the activity at hand is intrinsically motivating, meaning that the interest in the task is sufficient justification in itself. Thus, when an extrinsic reward is introduced, the person will experience overjustification (Lepper & Greene, 1978).

In 1971, another prominent researcher within the same field of research, namely Deci, explained that money as an external reward has a negative effect on intrinsic motivation due to a process of cognitive revaluation. This process occurs because the monetary reward indicates to the subject that the task is unattractive, since others assume that the subject will only perform if rewarded (Deci, 1971). This effect was also explained by Bénabou and Tirole (Bénabou & Tirole, 2003) in relation to a working relationship; when an employer rewards an employee for a specific task he is implicitly saying that the task is not reason enough in itself to do it.

Later on Deci presented his cognitive evaluation theory which states that there are two aspects to any extrinsic reward; a controlling aspect and an informational aspect. The impact of the reward on intrinsic motivation depends on which of the two aspects is more dominant in the specific reward (Deci, 1976). This theory was further developed into self-determination theory where the degree of internalisation of the extrinsic element was introduced (Gagné & Deci, 2005). Both these theories will be explained in more detail later.

Throughout the 1980’s and 1990’s several other researchers investigated the effects of extrinsic rewards. Schwartz explored how extrinsic rewards tended to limit subjects to behaviour which had previously resulted in rewards (Schwartz, 1982). Amabile found that
extrinsic rewards extinguish creativity (Amabile, 1996). Lepper discovered that children who were rewarded for a task were less systematic in their approach to it and took longer time to solve it (Lepper & Cordova, 1992). Other researchers worth mentioning include Kruglanski, Condry, McGraw, and Boggiano.

Some of the most recent literature is written by Kohn and Pink, who have both laid out the literature on the subject in a more easily accessible way in their popular books; “Punished by Rewards” and “Drive: The Surprising Truth about What Motivates Us”.

Now that the background of intrinsic motivation and the history of the effect have been examined, how and why rewards are popular in society will be the focus.

THE RISE OF THE REWARD SOCIETY

“The more rewards are used, the more they seem to be needed”
- (Kohn, 1999, p. 17)

Researchers have often looked upon motivation as something that is created by external forces in the environment, even though research dating as far back as the 17th century has argued for a more complex view. We now look at how the beliefs about external rewards have come to be so popular in society.

When trying to comprehend how society today perceives and uses extrinsic factors to motivate people it must first be understood where the notion of rewards and punishment come from. Some might argue that the concepts have always been around, but a closer look reveals that one particular branch of psychology, namely behaviourism, has had an important impact on how much rewards are used.

The idea behind behaviourism is the belief, that everything human beings do can be explained in terms of negative and positive reinforcements. Countless of studies on dogs, pigeons and rodents convinced these researchers that reinforcements/rewards were the optimal predictors of behaviour (Kohn, 1999) and that these results could be used to infer human behaviour.

Taylor’s “Principles of Scientific Management” of 1911 brought behaviourism to the workplace and introduced financial rewards to motivate workers. Scientific management
stripped jobs of being remotely interesting by breaking each process into smaller procedures and devising a clear plan of how tasks were to be done, depriving the workers of any autonomy (Buelens et al., 2010). This process was built on a view of human beings as simple utility maximisers, who are basically always aiming at maximising their rewards whilst minimising their effort. A view that also corresponds to McGregor’s theory X, stating that no one wants to do work for the work itself and thus people have to be incentivised to perform (McGregor, 1960). This is the very basic assumption that has caused the ‘reward and punishment’ society to advance (Buelens et al., 2010; Pink, 2010; McGregor, 1960).

Popularity of Reward Approach

Even though scientific management has since then be criticised profusely (Buelens et al., 2010), no one seems to have truly questioned the use of the rewards and punishment, also referred to as ‘carrots and sticks’. As Kohn warns “the time to worry is when the idea is so widely shared that we no longer even notice it, when it is so deeply rooted that it feels to us like plain common sense” (Kohn, 1999, p. 3). The idea behind rewards is that the best way to get something done is to provide a reward to people when they act the way we want them to (Kohn, 1999).

The underlying assumption of this idea could be seen as; we only work in order to obtain rewards. Most will probably agree that this is an oversimplification of human nature and that reasons for exerting an effort go beyond simply being awarded (Buelens et al., 2010). However, this does not change the fact that contingent incentive systems are currently implemented everywhere from business through to our private sphere. Furthermore, there are signs that incentivising is continuing to raise in popularity, as some schools create pure token economies, where all good behaviour is awarded, and as more and more companies implement pay-for-performance schemes (Kohn, 1999).

Rewards are believed to work first-and-foremost because it makes intuitively sense; when the opportunity to receive something you want is dangled in front of you, you are willing to work hard to get it. Economical theory supports this belief; that as rational decision-makers people will do what they can to seek utility and avoid disutility (Kohn, 1999).

The approach is also very effective at creating compliance; just think of what you can get an animal to do when their favourite snack is used as inducement or the immediate effect when promising a child a toy if they keep quiet. The possible negative effect for the most part shows up in the long run and therefore the causality relationship between the rewards and the negative effect gets blurred (Kohn, 1999). When looking at the initial reasons for
using rewards in the first place, it appears as if the goal of them often goes beyond compliance, as the rewarder hopes to create a positive change that will persist (Kohn, 1999). However this positive long term effect, it will be shown, is questionable.

Rewards are not only effective in the here and now but they are also a very easy tool to use, as Kohn puts it “[a reward] is seductively simple to apply” (Kohn, 1999, p. 17). Finding out the reasons behind why the child is making noise or why an employee is not performing up to standard is much more complicated and demands a lot more effort and time of the rewarder. This makes carrots and sticks attractive because they do not demand understanding. This lack of interest in the reasons behind people’s behaviour can be said to support the researcher who, like Kohn, believes that all forms of rewards are a control mechanism and nothing more; “the point to be emphasized is that all rewards, by virtue of being rewards, are not attempts to influence or persuade or solve problems together, but simply to control” (Kohn, 1999, p. 27). This point of view might be seen as the extreme, but it definitely illustrates that a strong argument can be made for rewards being used as an easy way out. In an organisational perspective this can lead to the somewhat provoking question; are incentive plans used as a substitute for management? Answering this question is not the aim of this paper, however, it will be shown that the alternative to extrinsic rewards and other extrinsic constraints does demand effort from the management.

Pervasiveness of Rewards in Society

How hard will it be to convince people in today’s society that extrinsic rewards might not be the way to go and that rewards could actually hurt interest in the rewarded activity? Ann Boggiano and her colleagues attempted to answer this question in a study in which they found, as expected, that people believe firmly in the positive effect of rewards. Furthermore, the subjects maintained this belief even after they had been presented with data indicating that the opposite is true (Boggiano et al., 1987; Barrett & Boggiano, 1988). If this finding is valid it shows that the negative effect of rewards is so counterintuitive that people respond with disbelief. This might very well be one of the explanations for why businesses have not yet shed off the idea, that the way to get employees to perform their very best is by giving them external incentives.

Some other interesting research suggests that people do not see themselves as being driven by money or rewards, but when they are asked what their co-workers or subordinates are driven by the answer is clear; everybody else is driven by money. This belief that everybody else is driven by external rewards makes it clear why so many managers decide to use rewards in their motivational efforts (Kohn, 1999). Money is furthermore an integral part of
business, as most work to earn money; therefore it must seem almost obvious to managers that money can be used to exert motivational influence on their employees (Gagné & Deci, 2005).

Having seen why extrinsic constraints like rewards are so popular in society today, the attention will now be on the proponents of the use of extrinsic rewards, followed by the opponents’ view.

EXTRINSIC REWARDS EFFECT ON MOTIVATION

To understand extrinsic rewards’ effect on motivation both the proponent view of rewards and the opponent view will be discussed. However, a slightly different approach will be taken in the two sections. In the first section some of the different advocates of rewards will be considered, whereas the second section will focus on why and how rewards can have a negative effect, as opposed to simply going though the different opponents of rewards.

PROPRIETORS OF EXTRINSIC REWARDS

“Having a job, going to work and caring out the tasks assigned is something people do because they receive something in return for their effort”

- (Buelens et al., 2010, p. 161)

The Behaviourists

Most of the researches that support the use of rewards to motivate are from the behavioural school of thought. Taylor based his scientific management theory on the simple assumption, that if people are paid sufficiently they will be motivated to do just about anything (Brooks, 2009).

Skinner’s research has had major impact on the perception of rewards as a great means to affect behaviour. Skinner argued that behaviour is a result of reinforcers either positive or negative. Positive reinforcers are typically some kind of reward, whilst negative reinforcers are actually punishments that have their reinforcing effect because subjects try to avoid them. In other words, a reinforcer is a stimulus that is either given or removed (depending
on whether it is a positive or a negative one) after a desired response and in this way the probability of that response is increased (McCullers, 1978).

This definition indicates that reinforcers always strengthen the desired behaviour and thus, it implies that rewards as an example of a positive reinforcer always will enhance the behaviour it was given for. Skinner conducted multiple animal experiments in laboratory settings and they all pointed towards rewards facilitating performance. His research suggests that when using simple subjects (rats, dogs and pigeons) and simple tasks, the introduction of a reward will increase both the frequency and the speed of the wanted response. This way of thinking has been widely accepted in both education and society at large, partly because of the substantial evidence that supports it, partly because it seems intuitively true and partly because it is a wonderfully simple way to explain behaviour (McCullers, 1978).

Skinner’s operant conditioning concept was to some extent based on the stimulus-response model that was developed by another behaviourist, namely Pavlov (Brooks, 2009; Atkinson, 1964).

Classical Motivation Theories

When speaking of the classical motivation theories, many of them have a favourable view on the use of rewards. Examples are the expectancy theories by Vroom, and Porter & Lawler. Expectancy theory was developed as an alternative to behaviourism and it is based on the assumption that “humans act according to their conscious expectations that a particular behaviour will lead to specific desirable goals” (Brooks, 2009, p. 83). In 1964 Vroom developed his expectancy theory that said that motivation is the result of the expectation that a given outcome will derive from a particular behaviour combined with the appreciation for or valence of that outcome.

Thus, if a person expects that behaving in a certain way will lead to a specific outcome, such as a raise, and that person values money, he or she will be motivated to engage in that behaviour. Porter and Lawler further developed this expectancy model when they incorporated the subject’s abilities and role perceptions into the model (Brooks, 2009) (see model in appendix 1). They also stated that performance can lead to two different types of rewards; intrinsic and extrinsic, and argued that job satisfaction will be at its highest when the job leads to both types of rewards. Thus, it is implicitly assumed that extrinsic and intrinsic rewards are additive, and that they in combination add up to the total job satisfaction (Gagné & Deci, 2005). It should however be mentioned that an important
assumption for these theories’ support of rewards is that the people involved actually value the rewards given, whether they are intrinsic, such as achievement, or extrinsic, such as money (Brooks, 2009).

Other Supporters of Rewards

Several studies all throughout time have shown that rewards can be an effective tool to create efficiency; in Lepper et al.’s studies the children drew more pictures when rewarded (Lepper et al., 1973), and in Kruilanski et al. rewarded subjects produced the highest quantity of output (Kruglanski et al., 1977). The effect that is here highlighted is that a reward “gains control of the activity, increasing its frequency” (Schwartz, 1990, p. 10).

However, even when it comes to studies testing the effect on intrinsic motivation, some have been able to show a positive result. Instead of going through various stand-alone studies showing a positive effect of rewards on motivation, the 1994 meta-analysis by Cameron & Pierce will be used.

This meta-analysis concluded that rewards, overall, do not decrease intrinsic motivation. Cameron & Pierce investigated just over 100 studies on how rewards and reinforcements affect intrinsic motivation. They used four measures of intrinsic motivation, taken from the studies in question, however, they focused on the two most commonly used, namely; free time spent on the task and attitude towards the task (Cameron & Pierce, 1994).

The free time spent on task measure was the odd one out according to Cameron and Pierce, since it was the only measure of intrinsic motivation which indicated a decrease in intrinsic motivation when rewards were introduced. However, they noted that this effect was not statistically significant. When attitude was the measure used, intrinsic motivation increased for rewarded subjects, whilst with the remaining two measures there was no significant effect at all on intrinsic motivation for rewarded subjects.

Cameron & Pierce’s meta-analysis also concluded that there are certain factors which affect whether rewards enhance or reduce intrinsic motivation. Generally, they found that when the attitude measure is used both tangible and verbal rewards seem to have a positive effect on intrinsic motivation. Additionally, unexpected rewards were found never to be hurtful, whilst, expected rewards were only harmful when the free time measure was used. Finally, they found that performance-contingent rewards, which are given when a specific level of performance is reached by the subject, led to a higher intrinsic motivation according
to the attitude measure, whereas the free time measure indicated no significant impact at all (Cameron & Pierce, 1994).

All in all, these findings led Cameron & Pierce to conclude that rewards generally do not undermine intrinsic motivation (Cameron & Pierce, 1994).

OPPONENTS OF EXTRINSIC REWARDS

“This is one of the most robust findings in social science – and also one of the most ignored”
- (Pink, 2010, p. 39)

The history of how the detrimental effect of extrinsic reward was first discovered, and how the research field developed in the 1960’s and 1970’s with influential researchers like Deci, Ryan, Lepper and Greene has already been described. Therefore, rather than exploring the roots further, the focus will now be on the different explanations that have been given for the negative effect of extrinsic incentives and a closer look at some of the more influential studies.

The research on extrinsic rewards’ negative effect on motivation brings forth the hypothesis that the use of extrinsic constraints will change how a person approaches and solves the task at hand, and influence whether or not the person will be inclined to approach and solve a similar task in the future (Lepper & Greene, 1978). In this section the first topic investigated will be the negative effect rewards have on intrinsic motivation. Following this will be a discussion on, how rewards change people’s focus, how rewards can devaluate a task and how rewards can be experienced as controlling. This leads us to look at how rewards change people’s approach and how rewards may undermine creativity. Finally, the section will end with a discussion of whether or not rewards and punishment are indeed the same and whether rewards can have a long-term effect or not.
Adverse Effect on Intrinsic Motivation

“Who would have thought that play could be turned into work by rewarding people for doing what they like to do?”
- (Anderson et al., 1976, p. 915)

In the research carried out for this paper one anecdotal story has been retold a surprising amount of times in a wide variety of literature. The story varies in content but the moral stays the same and it is added here because it illustrates that the understanding of how rewards can undermine intrinsic interest appear to pre-date the research.

A Jewish tailor had opened a shop. To drive him out of the town some of the town folk set a gang of boys to annoy him. Day after day they stood at the entrance of his shop. “Jew! Jew!” they shouted. After many sleepless nights the tailor developed a plan.

The following day, when the boys came, he went to the door and said, “From today on any boy who calls me “Jew” will get a dime from me.” Then he put his hand in his pocket and gave each boy a dime.

Delighted the boys came back the following day and began to shout, “Jew! Jew!” The tailor came out smiling. He put his hand in his pocket and gave each of the boys a nickel, saying, “A dime is too much – I can only afford a nickel today.” The boys went away satisfied.

However, when they returned the next day, the tailor gave them only a penny each. “Why do we get only a penny today?” they yelled. “That’s all I can afford.”

“But two days ago you gave us a dime, and yesterday we got a nickel. It’s not fair, mister.”

“Take it or leave it. That’s all you’re going to get!”

“Do you think we’re going to call you “Jew” for one lousy penny?”

“So don’t!” And they didn’t.

Edited version

But originally it is reprinted from A Jewish Folklore.

What this story depicts is that rewards send a powerful signal to the receiver; when rewards are provided the assumption that someone would not do this without a reward cannot be denied (Kohn, 1999). This has two obvious consequences the first being that when behaviour has once been rewarded the rewards need to keep on coming (this will be discussed later) and the second, that the receiver will lose their internal drive to do that task. This last consequence is very serious because when it comes to motivation, the quality and lasting commitment that intrinsic motivation creates cannot be matched (Kohn, 1999).
Intrinsic motivation

Let us look beyond fables to see how important intrinsic motivation is; Tremblay et al. and Deci & Gagne have studied the differing outcomes from a workforce motivated by extrinsic versus intrinsic means (Tremblay et al., 2009; Gagné & Deci, 2005).

Tremblay et al. hypothesised and were able to show that organisational support and commitment, job satisfaction and work climate were significantly linked with work self-determination (Tremblay et al., 2009), which according to Deci and Ryan’s self-determination theory corresponds to intrinsic motivation (Ryan & Deci, 2000). Furthermore, the experiment showed that intrinsic motivation was negatively correlated with work strain, turnover intentions and other deviant behaviours (Tremblay et al., 2009). In total this shows that the intrinsic motivation may bring with it several positive consequences for the organisation and its people.

In the same study the effect of low work self-determination or low intrinsic motivation was found to be negatively linked to citizenship behaviours and positively linked to deviant behaviours; meaning that the subjects were more likely to engage in antisocial behaviours (Tremblay et al., 2009).

What this study shows is not that intrinsic motivation always leads to a job well done, but it does give an idea that intrinsic motivation can be seen as a powerful predictor of job satisfaction. Other studies have supported this and gone further to show that performance can also be improved; Koestner concludes that intrinsically motivated people “pursue optimal challenges, display greater innovativeness, and tend to perform better under challenging conditions” (Koestner et al., 1987, p. 389).

The Effect

Having shown why intrinsic motivation is important, how extrinsic motivation might crowd out intrinsic motivation will be investigated next.

The first research on this effect appeared in the early 1970’s, when two psychologists working independently and using different methods both arrived at the same conclusion; working for a reward made people less interested in the task. The two researchers were Edward Deci and Mark Lepper, the first used college students and money to show the effect, the second used children and personalised certificates (Kohn, 1999). As these studies can be accredited with being the first of their kind in scope and hypothesis, they will now be explained in more detail.
Edward L. Deci, at the University of Rochester, performed a series of experiments with college students. Each subject was asked to work on an interesting Soma puzzle (see appendix 2), half of the subjects were offered money, the other half were not. At the supposed end of the session the experimenter told the subject that it would be a few minutes before the result was ready and then left the room. The subjects were then observed in secrecy to see if they would continue to play with the puzzle, read one of the magazines placed nearby or simply be passive. The subjects that had been paid turned out to spend substantially less time playing with the puzzle than the subjects in the group that had not experienced any external reinforcement; showing that working for a reward made people less interested in the task at hand.

Using free-time behaviour as the measure of intrinsic motivation led Deci to confirm the hypothesis in his 1971 article that; "if a person is engaged in some activity for reasons of intrinsic motivation, and if he begins to receive the external reward, money, for performing the activity, the degree to which he is intrinsically motivated to perform the activity decreases" (Deci, 1971, p. 108).

When this article by Deci was published Mark Lepper of Stanford University was in the mist of writing up his own findings on the subject. Lepper had observed young children in their classrooms drawing pictures – an activity that was perceived as intrinsically interesting for children of that age (Lepper et al., 1973). Some of the subjects were told that they would receive a personalised certificate with ribbon and a golden star for their drawings, some got the reward without expecting it, and the rest were the control group who were told nothing and received nothing. The following two weeks the children were observed and it was found that the subjects that had been promised a reward showed a lower probability of drawing than both the group that received an unexpected rewards and the group that did not receive a reward at all. Furthermore, the subjects that had been promised a reward were now also less likely to draw pictures than they had been before the experiment.

Even though the two experiments were different in design and execution, the conclusion remained the same; extrinsic rewards reduce intrinsic motivation (Kohn, 1999). It is of course important to remember that these particular studies only show a negative effect of rewards when intrinsic motivation is there to begin with (McGraw, 1978; Deci, 1976). In other words, when the task is interesting enough and when the solution to the task is open-ended, and therefore not immediately obvious, then incentives will have the most harmful effect (McGraw, 1978).

Over the following years many more studies have also confirmed these results. Therefore, it can be said that even though rewards often ‘work’ in creating compliance and sometimes
also in improving efficiency, these studies show that there might be unforeseen hidden costs as a consequence of a decrease in intrinsic motivation (Gagné & Deci, 2005).

A long-term effect
Extrinsic rewards have often been criticised for only having a short-term effect on performance, however, it can be argued that the more critical aspect is that the effect might have a long-term effect; extinguishing the interest and enjoyment in the activity for long periods of time (Kohn, 1999).

To give an example we can look again at Lepper’s above mentioned study. Lepper found that after having just been rewarded once, the children’s interest in drawing seriously diminished for two weeks. Ross promised a reward for playing with the drums and saw the subjects being less interested in playing the drums for four to five weeks after the reward situation had taken place (Ross, 1975).

Finally, Deci also proved this long term effect in his 1971 field experiment at a college newspaper. The performance measure used was time spent on making headlines for the biweekly newspaper. The subjects were divided into two groups; one was paid for each headline they produced for a few of the issues they put out, while the other group never experienced payment. The rewarded group’s intrinsic motivation decreased compared to the control group and did not manage to recover fully within 5 months, thus proving a long term negative effect (Deci, 1971).

These studies, if their premise holds, have large implications for different incentive systems, and show how sensitive intrinsic motivation can be when contingent rewards are in play.

In the following sections different researchers’, including both Deci and Lepper, explanations for why intrinsic motivation diminishes and what consequences this might have will be discussed.

Rewards Change Focus

“Do this and you’ll get that”
makes people focus on the “that,” not the “this”
-(Kohn, 1999, p. 67)

It has been suggested that the negative effect that arises as a consequence of rewards, is due to the fact that rewards distract people from the task at hand. This was one of the first suggestions launched when the puzzling and paradoxical effect of rewards started to appear (Kohn, 1999). It makes intuitively sense that the problem with rewards is this change of focus, as the person being rewarded is now thinking about the reward instead of the task.
The Larger the Reward, the Larger the Damage

It can therefore be assumed that the larger the reward the more distracting it will be. For support of this we turn our attention to Ariely et al. (Ariely et al., 2009) and to their experiments in India and the US with varying monetary rewards. In their experiments subjects worked on several different tasks whilst receiving performance-contingent rewards ranging from small, medium to large in size (Ariely et al., 2009). The assumption was that the increasing incentives would increase motivation and thereby performance. However, the result showed that across a variety of different tasks, the highest paid, who could receive as much as five months’ pay, had the lowest performance (Ariely et al., 2009). The consistency of these findings was particularly surprising because of the variation between the tasks; some demanding only simple memorising and others calling for creativity. The only task where performance rose with incentives was the one that only demanded physical effort (Ariely et al., 2009). It could be that these results are due to a loss of focus; brought on by a sufficiently large reward stealing concentration and adding a lot of pressure.

Salience

Proving that focus may not be the only thing creating the negative effect, are the studies on salience. The concept of salience was thoroughly investigated by Ross in 1975 (Ross, 1975). In Ross’ definition a reward is salient if it is prominent in the mind of the subject whilst doing the activity in question. In his first experiment Ross offered two groups of subjects a reward for doing a specific task. Then he gave one group a reminder of the reward during the activity, whilst the other group had only been told about the reward prior to the activity. He found that only the reward-salient group experienced a decrease in motivation. Thereby this first experiment actually supported the distraction hypothesis; that is a salient reward steals focus.

However, in a follow-up experiment Ross used four groups; the first was asked to think of the reward while performing the activity, the second was offered a reward and then told to think of snow whilst working on the task, the third group was offered a reward but received no further instructions, the fourth group was a control group that was not offered a reward at all. The subjects in the groups that were asked to think of the reward and the ones who received no instructions showed a significantly lower level of intrinsic motivation compared with the other two groups (think of snow and no reward) (Ross, 1975).

Two conclusions were made based on these results; first, salient rewards undermine intrinsic motivation and second, the effect is not simply because the subjects are distracted from the task. Ross’ second conclusion had first been suggested by Reiss and Sushinsky (Reiss & Sushinsky, 1975) and was later confirmed by Smith and Pittman (Smith & Pittman,
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In 1978, it was thereby proven that a change of focus could not be used as the sole explanation for the negative effect; if it had been so, the group thinking of snow would also have showed a decrease in motivation.

In conclusion, even though the change of focus intuitively makes sense, subsequent research has shown that there is a lot more involved than just distraction (Kohn, 1999).

Rewards devaluate the task

“Explicit incentive schemes may sometimes backfire, especially in the long run, by undermining agents’ confidence [...] in the value of the rewarded task.” (Bénabou & Tirole, 2003, p. 516)

Already in 1971 Deci found that rewards have a strong, and potentially harmful, signalling effect. The bare presence of the reward sends a powerful message that the task needs outside inducement, implying that it is not interesting enough in itself (Deci, 1971).

Mark Lepper showed this effect by dividing a group of school children into two. The first group were told that in order to get to draw with crayons, they had to draw with pens first. The other group was told the opposite; crayons first, and then they could play with pens. Two weeks later he returned to the school to find that the activity that had been a prerequisite to the other was now far less popular (Lepper et al., 1982). What happened here can be explained very clearly with the statement that giving a reward for an activity is “tantamount to declaring that the activity is not worth doing for its own sake” (Morgan, 1984, p. 5).

Bénabou and Tirole reached a similar conclusion when they discussed that when an employer gives a special reward to an employee for doing a task, he is implicitly saying that he expects that this is the only way he can get the employee to do the task at all. They also introduced the interesting notion that the rewarder, typically a boss, teacher or parent, often has some kind of inside information about the task and so the rewardee, who may not have participated in the activity previously, can only infer whether it is an interesting task or not from the signals sent by the rewarder. In other words, it is the information asymmetry that causes the re-evaluation of the task (Bénabou & Tirole, 2003). Furthermore, some researchers have found evidence that the higher the reward is, the more negative the impact on the feelings and interest in the activity (Freedman et al., 1992).
For a given person, an activity will usually be associated with either an intrinsic or an extrinsic orientation and all future relations with the activity will be coloured by that orientation. That is, if a person has an extrinsic approach to a task, this is also the approach that will be taken to the same task at a later point in time. When a reward is offered for a task, it turns the activity into a means to an end, namely the reward. In other words, even if the subject is originally intrinsically oriented towards the task, after the introduction of the reward the extrinsic orientation will dominate. This means that the reward makes the subject redefine the conditions under which the task will be performed. If something has been done before because of an intrinsic interest in the task, the reward might reframe the task as something which is done only to receive a reward (Pittman et al., 1982).

An interesting way of explaining how a reward can devaluate a task is to look at the reverse situation. Imagine having to pay to participate in an activity. The payment in itself indicates that this something is not only worth doing, but worth paying to get to do. Mark Twain explained it well in his famous fiction book ‘The adventures of Tom Sawyer’: “he had discovered a great law of human action, without knowing it—namely, that in order to make a man or a boy covet a thing, it is only necessary to make the thing difficult to attain. [...] Work consists of whatever a body is obliged to do, and that Play consists of whatever a body is not obliged to do” (Twain, 1962, p. 23). The reversed effect is also described; “there are wealthy gentlemen in England who drive four-horse passenger-coaches twenty or thirty miles on a daily line in the summer, because the privilege costs them considerable money; but if they were offered wages for the service, that would turn it into work, and then they would resign” (Twain, 1962, p. 23). This means that introducing money as a reward for an interesting or attractive task turns play into work, i.e. something that is a means to an end, rather than an end in itself. Dan Pink named this the Sawyer Effect (Pink, 2010, p. 37).

Control versus Autonomy

"The degree of one’s controlled motivation reflects the degree to which one feels coerced or seduced by external contingencies"
- (Gagné & Deci, 2005, p. 340)

Not only can extrinsic rewards devaluate the task at hand, but a reward in itself can also be experienced as controlling. Being intrinsically motivated is something which is experienced from within and this type of motivation can be seen as self-directed and autonomous. This is why some researchers have concluded that it is the controlling element of a reward that harms intrinsic motivation; control being the opposite of autonomy. Deci (1976) created a
theory that highlighted the negative effect on intrinsic motivation resulting from the controlling aspect of any extrinsic constraint; namely cognitive evaluation theory (Deci, 1976).

**Cognitive evaluation theory – control and information**

What Deci found was that all rewards have two aspects; one is controlling and the other is informative. Most rewards are conditioned on some kind of desired behaviour and thus the person receiving the reward is required to act in a certain way. Therefore, it can be said that rewards, to some extent, aim to control. However, in any reward there is also an informational aspect. Meaning that a person who receives a reward can infer from it that they are competent in relation to the task that triggered the reward, otherwise they would not have received a reward for it. The type of reward determines which of the two aspects is more salient. The most controlling rewards include money and avoidance of punishment. In contrast feedback and praise are perceived as less controlling and hence the informative aspect is more salient (Deci, 1976).

In some of Deci’s earliest research he set out to determine how the salience of the two aspects of extrinsic rewards affects intrinsic motivation. The subjects of the experiment were asked to do an intrinsically interesting task and received either a monetary reward or positive feedback for doing so. Since the subjects were initially intrinsically motivated to do the task, they had an internal perceived locus of causality. In other words, the subjects were doing the task for internal rewards, namely to feel self-determination and competence.

When the monetary reward, i.e. a controlling reward, was introduced the perceived locus of causality shifted from internal to external. This means that the subject now believed that they were doing the task for the money. In other words, the extrinsic reward has crowded out the original intrinsic motivation (Deci, 1971; Deci, 1976; Deci, 1972b). The subjects, who received positive feedback as a reward, experienced an enhancement of their initial intrinsic motivation; their feelings of self-determination and competence were increased (Deci, 1976; Phillips & Lord, 1980). Thus, when the informational aspect is most salient, an extrinsic reward will improve intrinsic motivation (Deci, 1971; Deci, 1976; Deci, 1972b).

In Deci’s own words the main proposition of cognitive evaluation theory is; “if the controlling aspect is more salient, it will initiate the change in perceived locus of causality process. If the informational aspect is more salient, the change in feelings of competence and self-determination process will be initiated” (Deci, 1976, p. 142).

**Self-determination theory**

Another consequence of the controlling reward is that it diminishes the subject’s sense of autonomy. Autonomy is probably the most important part of being self-determined and
intrinsically motivated, which is something that everyone desires (Kohn, 1999). The researcher de Charms put it in slightly different words when he said that; “*Man strives to be a causal agent, to be the primary locus of causation for, or the origin of, his behaviour; he strives for personal causation*” (de Charms, 1968, p. 269). Deci and Ryan agreed that self-determination and autonomy were crucial parts of the relationship between extrinsic and intrinsic motivation and so they expanded the cognitive evaluation theory into what is now known as self-determination theory.

Deci and Ryan discovered that the assumptions behind cognitive evaluation theory implied that managers had to focus on either motivating extrinsically or intrinsically, and this was found to be a significantly oversimplified way to view the concept (Gagné & Deci, 2005). Therefore, rather than making a distinction between extrinsic and intrinsic motivation, the self-determination theory continuum ranges from autonomous to controlled motivation (Gagné & Deci, 2005).

Autonomous motivation is best characterised by the experience of choice, whereas controlled motivation is experienced as external pressures to conform, and they both stand in contrast to amotivation, which is the complete lack of intention and motivation (Gagné & Deci, 2005). What is interesting here is that this self-determination continuum allows for several different types of extrinsic motivation, varying in the degree to which the subject internalises the extrinsic forces, thus providing a much more nuanced way to look at what types of motivation people can experience (Gagné & Deci, 2005; Ryan & Deci, 2000).

The reason why self-determination theory has been explained here is that this theory, for one focuses on how extrinsic means can be perceived as controlling and because it gives a whole new way of distinguishing between what is intrinsic and extrinsic motivation. This shows that even though extrinsic motivation may be brought on by external factors, it might still be internalised and be felt by the subject not as controlling but as self-determining (see figure 1 below).

However, the self-determination theory continuum is still relatively new; therefore the studies using the scale and validating its accuracy are scarce. Hence the new types of motivation suggested in this theory, will unfortunately not be explored further in this paper.

Figure 1.
Intrinsic motivation, as it has been shown, is sensitive to external elements. In particular control can have a negative impact on people’s ability to be self-determined and thereby intrinsically orientated. Two theories have especially focused on this predicament, namely cognitive evaluation theory and self-determination theory.

Rewards Change People

“There is evidence that extrinsic incentive conditions lead subjects to different strategic activities in a learning or problem-solving situation”

–(Condry, 1977, p. 470)

Several studies have suggested that when given tangible incentives, people tend to make more errors, solve the problems more slowly and make more stereotypical responses (Condry, 1977). In short, it has been observed that type of motivation affects the person and their approach fundamentally. It is these changes to people that are explored in this section.

The easy way out

When someone is offered an incentive, it not only changes the way the person solves the task, but it also changes their whole approach, e.g. people that are incentivised tend to choose easier tasks and become result-fixated (Kohn, 1999). It makes sense that this might happen; when a person comes to focus on reward attainment first and foremost, this person will prefer tasks that are simple and predictable, as this will reduce the risk that the reward might not be achieved (Lepper & Greene, 1978).

Using a problem-solving task that measured strategy thinking, Condry and Chambers found that people being rewarded went for easier problems, required more information before they could solve the task and, because of their focus on result, they were less logical in their problem-solving compared to non-rewarded subjects (Condry, 1977; Condry & Chambers, 1978). These types of findings have been replicated and the preference for simple tasks, when incentivised, seems to be a robust finding. It is not hard to imagine that this effect runs counter to many managers’ aim, as they end up having a work-force prone to cut corners.

Furthermore, Pittman et al (Pittman et al., 1982) found that an intrinsic motivational orientation is characterised by a preference for tasks that are “relatively complex, challenging, and entertaining”, leading the individual to gain more competence over time (Pittman et al., 1982, p. 789). Whereas an extrinsic motivational orientation lead subjects to
prefer tasks that are “relatively simple, predictable, and easily completed” (Pittman et al., 1982, p. 789). They further supported Condy’s findings by stating that the introduction of rewards fosters an extrinsic motivational orientation (Pittman et al., 1982).

Incidental learning
Another consequence of extrinsic rewards is the effect it has on the warerdee’s attention and the way he or she solves a task. A person being rewarded will most likely focus exclusively on the elements of the task being rewarded, and this runs the risk of undermining what researchers refer to as “incidental learning” (Kohn, 1999). To illustrate this effect one of the oldest experiments of its kind can be used; Bahrick, Fitts and Rankin gave adult subjects a tracking task, half where promised a reward, and half were not. During the tracking course, lights placed in the periphery were unexpectedly turned on and off. Afterwards the subjects were scored on their ability to remember the lights, the rewarded group not only scored substantially lower than the control group, but a little under half of the subjects could not even remember seeing any lights, ergo little incidental learning occurred (McGraw, 1978; Bahrick et al., 1952).

It can therefore be concluded that rewards will lead subjects to focus their attention on instrumentality-relevant response parameters, which may improve their performance along those selected dimensions; e.g. tracking abilities. However, at the same time, it may result in lower performance along other dimensions not seen as relevant to the attainment of the reward; e.g. noticing the lights (Lepper & Greene, 1978).

What happens can be summarised as; “when we are working for a reward, we do exactly what is necessary to get it and nothing more” (Kohn, 1999, p. 63).

Leaning up against the findings regarding incidental learning it can be said, as John Condry dramatically put it, that rewards are “enemies of exploration” (Condry, 1977). Lack of exploration and reflection might be okay on some tasks, but if the tasks are complex or call for creativity, inefficiencies might arise (more on this effect in the following section) (Kohn, 1999).

In conclusion the argument here is that incentives in the workplace can have the effect of “discouraging people from taking risk, thinking creatively and challenging themselves” (Kohn, 1999, p. 65).

Competing for Rewards
How people work together and associate with their colleagues in general is also affected by extrinsic rewards systems. As soon as a reward system is in place people will, to some extent, focus on winning. Even though competing might be something people will respond
to, winning is an extrinsic goal, which can be experienced as controlling and therefore it undermines intrinsic motivation (Deci & Ryan, 1987). Furthermore, extrinsic incentive systems run the risk of destroying teamwork, as intra-group competition for rewards will hardly encourage people to share knowledge, help each other and ask for help. When the rewards become scarce e.g. if there is only one in the department that can receive a given prize, then the damaging effect of competition becomes even more pronounced (Kohn, 1999).

**Human nature**

Can we be sure that this lazy and risk-averse attitude is not just human nature? This opens up an entirely new discussion about human nature, which will not be discussed in depth. It suffices to say that since McGregor first published his book “The Human Side of Enterprise” in 1960, the idea that humans have a fundamental thirst for knowledge, challenge, development and responsibility has grown in acceptance (McGregor, 1960). Furthermore, the experiments mentioned so far have all showed the control group outperforming their experimental counterpart under the influence of incentives.

Regarding human nature and rewards another interesting fact can be mentioned, namely that rewards sometime bring out the worst in people. Different incentive studies have shown that when people are working to obtain a reward, they are more likely to make unethical decisions e.g. gaming the reward system by overstating their own effort or moving numbers around to make themselves look better (Pink, 2010; Irlenbusch, 2006). This is one of the very critical ways of how rewards can change people, as people’s ethics and the company’s reputation are at stake. The subject of how incentive system can corrupt, is already a known consequence in the business world, it has therefore been decided that a longer discussion of how human nature and rewards affect each other is outside of this papers scope.

Now that several ways in which rewards change people have been looked at, a more detailed look on how rewards and creativity interact will be taken.
Creativity & Complexity

“For artists, scientists, inventors, school children, and the rest of us, intrinsic motivation [...] is essential for high levels of creativity”

—(Pink, 2010, p. 46)

As it has been discussed extrinsic rewards affect people’s approach and make them less exploratory. Therefore, it should not come as a huge surprise that complex tasks or tasks that require creativity will not be solved in the best possible way, if controlling external rewards are in play.

Creativity is an interesting concept; it is one of the few types of behaviour that cannot be achieved simply by trying and therefore its presence may seem somewhat elusive. Teresa Amabile, a Harvard professor, has chosen to study creativity with a focus on how motivation affects it. Amabile’s framework suggests that creativity is a result of domain-relevant skills, creativity-relevant skills and task motivation (Amabile, 1996). Looking at task motivation as a contributing factor to creativity makes Amabile’s perspective stand out from researchers before her.

Before attempting to understand how creativity works, a definition might be in order; Amabile subscribes to the belief that a product or output can be called creative if it is judged so by observers familiar with the domain in which the product was created (Amabile, 1996). She goes on to state that a creative response is a novel and appropriate solution to a task where the solutions may be many and are unobvious, “if the solution is clear and straightforward the response cannot be considered creative “ (Amabile, 1996, p. 133). This definition can obviously be questioned, but as Amabile’s study on motivation’s effect on creativity will be the main focus for this section, using her definition makes sense.

Algorithmic versus Heuristic Tasks

In support of Amabile’s definition and to further understand how complex and creative tasks are set apart from other tasks, the terminology algorithmic and heuristic can be used to define the difference. McGraw (1978) defined algorithmic tasks as tasks that depend on following an existing path to a logical conclusion; that is where there is only one right answer. Heuristic tasks on the other hand can be seen as a problem for which the person must first develop the algorithm (McGraw, 1978). Solving an algorithmic task primarily demands left-brain thinking, whereas heuristic tasks demand flexible problem-solving, inventiveness and right-brain thinking (Pink, 2010). McGraw went on to propose that extrinsic motivation will undermine performance on creative heuristic tasks, but enhance
performance on straight-forward algorithmic tasks (McGraw, 1978). Understanding the difference between creative tasks and simple task, the focus will now be on how heuristic tasks are best solved.

In order for a heuristic task to be resolved and for a creative process to take place, a temporary “step away” from the perceived goal is needed. For instance it might be necessary to direct attention toward seemingly secondary aspects of the task and the environment to find the solutions (Amabile, 1996). To support McGraw’s theory that motivation on heuristic tasks might be damaged by extrinsic motivation, Kruglanski et al.’s 1977 findings can be used. They found that a person working under extrinsic motivation may adopt a minimax strategy, in which the person strives to do the least possible of the task, for the most possible reward (Kruglanski et al., 1977). This focus on the reward, instead of the process, indicates that a minimax strategy will lower the chances of a novel approach, where the person looks beyond the goal (Amabile, 1996).

Even behaviourist like Barry Schwartz have run into this obstacle; when Schwartz attempted and failed to condition pigeons to peck in novel ways, he argued that it was down to the pigeons lack of intelligence (Kohn, 1999). However, when he did a similar study on humans the result was the same; when rewarded, humans were less likely to be flexible and innovative(Kohn, 1999; Schwartz & Lacey, 1982).

**Intrinsic Motivation & Creativity**
Amabile also theorised that intrinsic motivation is conducive to creativity, and that extrinsic motivation is detrimental, hypothesising that: “*Any of a wide variety of extrinsic constraints will, by impairing intrinsic motivation, have detrimental effects on creative performance*” (Amabile, 1996, p. 93). Again it is intrinsic motivation being threatened, however, now the problem is that intrinsic motivation is crucial to creativity.

To see how Amabile supported her hypothesis a look at one of her early experiments might be helpful. Using a collage-making activity as the task and judging the level of creativity, a large group of psychology students were put to work. Half were given specific instructions and evaluated on their creativity (the evaluation represented the external constraint) while the other half were not. The judge’s rating of creativity strongly supported the hypothesis; the control group, showed higher creativity than the experimental group (Amabile p. 138). It is worth noting that in this and several other studies, the external force in play is evaluation and not money or praise as has been the norm in other studies explored, however, as long as the external constraint can be perceived as controlling the effect will be similar.
The result of this first experiment was repeated when Amabile and her colleagues tested the creativity of artists; judging commissioned work and non-commissioned work. The result was that work done on commission was judged significantly less creative (Pink, 2010). The artists themselves complained that commissioned work made them feel constraints. This feeling of constraint or a pressure to conform is incompatible with the creative process (Amabile, 1996).

**Mental Fixedness & Glucksberg**

For another experiment that shows the effect a reward has on how complex tasks are solved, attention is turned to the famous “Candle problem”. The following scenario lays the foundation for the problem; the participant is sat at a table next to a wall, in front on the table lays a candle, a box of thumbtacks and some matches. The task is to attach the candle to the wall so that the wax does not drip on the table (Pink, 2010). Many different approaches can be taken, but only one works and it demands some creativity. The solution is to empty out the box of tacks and attach the box to the wall with the tack, placing the candle in the box and voila the solution is found (see illustration in appendix 3).

The candle problem was created by the psychologist Karl Duncker in the 1930’s, however, the experiment of interest here was carried out by Sam Glucksberg, a psychologist at Princeton University, in 1962 (Glucksberg, 1962). Glucksberg divided the participants in his experiment into two; the first group was told that they would be timed to establish norms, the other group were told that the fastest participants would get a monetary reward. The surprising result was that the incentivised group took on average three and a half minutes longer to solve the task, a highly significant difference (Pink, 2010; McGraw, 1978). This is a great example of a task that is not straightforward and where the subjects need to think in novel ways.

The problem here is that the person needs to overcome a mental obstacle. What happens when the person finds the solution is that they overcome what is known as ‘mental fixedness’; they first saw the box only as a container, but suddenly realised that it could have another function (Pink, 2010). Glucksberg did another experiment using another functional fixedness problem in 1964 which replicated the findings (McGraw, 1978). These studies can be seen as evidence that heuristic tasks are best solved by people not influenced by external rewards.

**Mitigating Circumstances**

In her many years working in the field Amabile has also found different mitigating circumstances under which extrinsic factors can be used without destroying intrinsic motivation, leading to the conclusion that the effect is more complex than first assumed.
Using Deci’s finding that rewards encompass two different aspects; a controlling and an informational one, it has been shown that if a reward is seen as mostly informational it does less damage to creativity, especially if it is experienced as enabling or as signifying competence. In a study carried out by Amabile and colleagues 1979 the group receiving informational evaluation did better than the group receiving a controlling evaluation, however, again the control group that received no evaluation were the most creative of all in the subsequent test (Amabile, 1996).

It has also been shown that if the reward has been crossed with the choice of task engagement, or if the participants have been allowed to decide how long they spend on the creative task, or if the subject has been trained to focus on intrinsic motivation and ignore extrinsic elements, then the effect of the reward on creativity may be positive (Amabile, 1996). These finding have, among others, lead Amabile to the belief that certain types of extrinsic motivation can be combined positively with intrinsic motivation and have a positive effect on creativity, these have been named “synergistic extrinsic motivators” (Amabile, 1996, p. 118). However, for synergistic extrinsic motivators to work another factor has to be considered, namely, where in the creative process the extrinsic constraint is introduced. The idea here is that the synergistic reward will work best if used in the less creative part of the creative process. According to Amabile, creativity is most important in the problem identification and response generation part of the process (see entire process below), whereas in the preparation and communication parts intrinsic motivation is less important and therefore less sensitive to extrinsic forces (Amabile, 1996).

Replication of part of figure from (Amabile, 1996, p. 119).

All these later findings led Amabile to adjust her principle of creativity to: “Intrinsic motivation is conducive to creativity; controlling extrinsic motivation is detrimental to creativity, but informational or enabling extrinsic motivation can be conducive, particularly if initial levels of intrinsic motivation are high” (Amabile, 1996, p. 119).
Rewards are Punishments

“Punishment and reward proceed from basically the same psychological model, one that conceives of motivation as nothing more than the manipulation of behaviour.”
-(Kohn, 1999, p. 51)

In the studies mentioned so far the extrinsic constraint has for the most part been rewards, however, this does not mean that the findings cannot be generalised to other extrinsic elements. In fact rewards and punishments have a similar effect, which is supported when Lepper’s definition is applied and rewards and punishments are seen as examples of “salient extrinsic control that may lead an individual to see his or her behaviour as extrinsically motivated” (Lepper & Greene, 1978, p. 121). Using this definition, extrinsic control can be seen as either carrots or sticks interchangeably. For further support of this Deci and Cascio’s research can be highlighted. In their 1972 study, they found that threats of punishment had the same negative effect on intrinsic motivation as monetary rewards (Deci & Cascio, 1972). Having established that the effect of rewards and punishments are the same to intrinsic motivation, attention is turned to how punishment, in general, is perceived.

Most managers and people in general have come to the conclusion that punishing someone is counterproductive and ethically questionable. Even behaviourists like Skinner suggest that using reinforcements instead of punishment is preferable (Kohn, 1999). This explains why rewards, incentives or reinforcements, are the preferred tool for motivating people.

Having seen that the effect of rewards and punishment can be the same, it can be asked: are rewards really all that different to punishment? This question is raised by Kohn in his 1999 book “Punished by Rewards” and his conclusion paints a less favourable perspective on rewards; “The troubling truth is that rewards and punishment are not opposites at all; they are two sides of the same coin” (Kohn, 1999, p. 50). The idea here is that rewards and punishment are not that different because basically they are used for the same purpose; to control. To see this, think of the rewarder that threatens to withhold something the rewardee would like, if he/she does not comply. The controlling mechanism here is quite the same as had the threat been of punishment. Furthermore, think of the feeling of loss when the reward is not gained; the feeling is not all that different from the feeling of punishment. To put it differently; when a reward is not granted it becomes a punishment.

It has been argued that punishing is unethical (Kohn, 1999), and seeing the similarities between punishment and rewards, it could therefore be inferred that rewards, depending on how they are used, have an unethical element to them too (Kohn, 1999). Obviously many
will disagree with this induction and it is not the aim of this paper to take sides in this debate. One’s view will most likely depend on a subjective opinion of what constitutes ethical behaviour and whether or not being directed in a situation where the person still has a choice (forgo the reward) can really be seen as ultimately controlling.

Rewards Must Continue

“Rewards must be judged on whether they lead to lasting change – change that persists when there are no longer any goodies to be gained”

– (Kohn, 1999, p. 37)

A natural question to ask is why the positive effect of the reward only lasts in the short run. A qualified guess might be that a reward does not look to answer why people do what they do; it only tries to affect what they do, without any concern for any underlying elements of motivation. This leads to the conclusion that in order for a reward to have any long term effect managers will have to keep giving them out (Kohn, 1999). This conclusion is supported by research by Kazdin and Bootzin, who in 1972 reported that a behavioural change only persisted while the reinforcements were given, and once they stopped, behaviour went back to the baseline level or below, i.e. the level they were at before the rewards were first introduced (Kazdin & Bootzin, 1972).

One of the explanations for why rewards must continue in order for them to have a positive effect on performance is explained by Pittman, Emery & Boggiano (Pittman et al., 1982); once a reward is given for an activity, that activity will be perceived as having an extrinsic orientation; that is something which is a means to an end. Naturally, once the end, in this case the reward, is removed, it becomes pointless to engage in the activity at all. In other words, once the reward has been introduced its continued presence is not only useful, but completely indispensable in getting the subject to continue engagement with the activity (Kohn, 1999; Pittman et al., 1982). Deci supported the proposition as well as he said that; “they end up behaving as if they were addicted to extrinsic rewards” (Deci, 1978, p. 202). Kohn explains how rewards become their own self-fulfilling prophecy as “the more rewards are used, the more they are needed” (Kohn, 1999, p. 17). This corresponds well with previous explanations, since if the reward had not been introduced in the first place, the shift to extrinsic orientation towards the task would not have occurred. And logically this orientation is enforced every time a reward is given for the task – feeding the addiction and further eliminating any intrinsic motivation to do the task.
THE RELATIONSHIP BETWEEN EXTRINSIC AND INTRINSIC MOTIVATION

“A number of possible relationships between the receipt of extrinsic incentives and subsequent intrinsic task motivation have been suggested”
- (Crino & White, 1982, p. 97)

As we have now seen, there are some conflicting views regarding extrinsic motivation and its effect on work performance. To summarise there is a large part of motivation theories that do not distinguish between extrinsic and intrinsic motivation and therefore do not allow for an interactive effect. Furthermore, the branch of psychology known as behaviourism is a strong proponent for the use of reinforcement to secure the behaviour we want to see in people. Finally, research showing that there are positive effects on effectiveness when rewards are offered is there in abundance; furthermore a meta-analysis from 1994 concluded a positive effect of rewards on overall motivation. In short it can be said that the proponents of extrinsic rewards, believing in either a neutral or positive effect of contingent rewards on behaviour are; certain motivational theories, behaviourism and empirical studies showing effectiveness increases during the reward period.

Summarising the arguments against extrinsic rewards we find a large amount of studies, often carried out within the field of social psychology, arguing that extrinsic rewards lead to a decrease in intrinsic motivation. This detrimental effect, it is said, is due to the fact that rewards devaluate the task at hand and can be experienced as controlling, which goes against our natural need for autonomy. Lower intrinsic motivation leads to, among other things; a fall in subsequent interest in the task and less job satisfaction. Furthermore, rewards risk changing people’s focus from the task to the reward, while also changing their approach, making them less creative, more risk-averse and less collaborative. Another argument against rewards is that they often only work to improve efficiency as long as the rewards keep coming and that their resemblance with punishments makes them ethically questionable.

The essence of the discussion appears to be what the relationship between extrinsic and intrinsic motivation is. Crino & White (1982) suggest four rival hypotheses that explain the relationship, they are corequisite, positive dependent, interactive and independent (Crino & White, 1982). These will be considered one by one.
The first, corequisite, sees the two types of motivation as dependent on each other; intrinsic motivation cannot exist without extrinsic motivation and vice versa. The second, positive dependent, sees intrinsic motivation growing with extrinsic reinforcements. The third, interactive, argues for a complex relationship where the two types of motivation can be either positively or negatively related. The fourth and last hypothesis, independent, proposes that the two types of motivation are unrelated and both contribute to motivation independently (Crino & White, 1982).

Condensing the different hypotheses down to two directly opposing perspectives, the discussion can be seen as whether the two types of motivation are additive or subtractive. With the proponents of extrinsic rewards emphasising an additive relationship while the opponents highlight the subtractive (Deci & Ryan, 2008).

Intuitively, the additive argument makes sense; surely two kinds of motivation is better than one. Calder & Straw see this paradox; “Common sense would lead one to expect that intrinsic and extrinsic motivation summate to produce satisfaction, and most organisational theories of job attitudes have made this assumption” (Calder & Staw, 1975b, p. 600). However, as it has been shown in this paper, a strong case for a subtractive relationship can be made. This case stands particularly strong because many studies that have confirmed it, and because many of the researchers that discovered this subtractive effect were expecting to prove the opposite. They set out to show just how positive the effect of extrinsic motivators is and then became puzzled by the results. This proves objectivity in many of the earlier studies, since the researchers were definitely not biased towards a subtractive relationship.

However, drawing up lines between the subtractive and additive effect is miss-leading, because when looking beyond the proponents on either extremes - such as Kohn who does not believe that anything positive can be said about rewards, and Skinner, who believed rewards were the ultimate tool of reinforcement - we can see that most researchers in the 21st century do meet at some point believing in both a negative as well as a positive effect of extrinsic rewards (Kohn, 1999; Pink, 2010; McCullers, 1978).

This leads to the conclusion that there is a complex interaction effect between intrinsic and extrinsic motivations. This corresponds to Crino’s third hypothesis, which proposed the interactive idea, and argued for a relationship where the two types of motivation can be either positively or negatively related. This is supported by the self-perception theory which predicts that intrinsic and extrinsic motivation does not combine additively but rather interact (Calder & Staw, 1975b). This gives a much less definitive way of looking at extrinsic motivation and should be seen as a caution to not give in to either extreme.
When Do Extrinsic Rewards Work?

The complexity of the relationship between extrinsic and intrinsic motivation indicates that different circumstances will lead to different effects. In other words, under some conditions extrinsic rewards will have a positive impact on motivation, whilst in other situations they will have a negative impact. For the purpose of this paper the conditions under which the undermining effect occurs are particularly interesting, as they are the most puzzling. However, under some circumstances most agree that extrinsic rewards work, and these will be briefly discussed now.

Deutch rather bluntly stated that rewards will only work for people who are “alienated from their work” (Deutsch, 1985, p. 162). Even though his words seem harsh, there is some truth to the point he is trying to make; if a person is not interested in their work and does not find it intrinsically motivating, obviously, an extrinsic reward cannot crowd out intrinsic motivation – because it was never there in the first place (Deci & Ryan, 1987). Using the opponents of rewards own arguments it can therefore be hypothesised, that when there is no interest in the task, the negative effects will be very limited. This is further supported by research stating that to enhance the short-term interest in a tedious task rewards are sometimes successful (Boggiano et al., 1982).

Miller and Glucksman have also found evidence that rewards enhance performance when the task at hand is sufficiently simple. Furthermore, if the sought after effect is only immediate and the subject is not going to participate in the activity at a later point in time, the negative effects of a reward become less relevant and thus, may be disregarded (Kohn, 1999). Deci has also pointed out that salary, which is not dependent on the employee engaging in a specific task, and unexpected bonuses, will not decrease intrinsic motivation (Gagné & Deci, 2005; Deci et al., 1999).

When rewards are used there are a number of advices to follow to reduce the probability of the negative effect occurring. Kohn suggests the following; make the reward less salient, give unanticipated rewards, and do not make the reward dependent on some kind of competition (Kohn, 1999). Pink says that if the task is mostly routine and it is difficult or even impossible to make it more challenging or connect it to a greater purpose, rewards can be used to motivate (Pink, 2010).
CONDITIONS FOR THE EFFECT

“Rewards can have either undermining or enhancing effects depending on circumstances”
- (Morgan, 1984, p. 25)

There are numerous factors on which the validity of the negative effect of extrinsic rewards on intrinsic motivation is contingent upon. Many different researchers have set out to determine some of these contingencies through various experiments. In this section some of the most prominent conditions and their effect will be discussed.

Expectancy

Expectancy has proven to play an integral part in whether the effect occurs or not. This means that it is only when the reward is expected that the undermining effect occurs, in other words how the reward is administered makes a difference. This was proven by Lepper et al. (Lepper et al., 1973), who found that only children who received an expected reward experienced a decrease in intrinsic motivation, whereas children, who received an unexpected reward, experienced no such negative effect. These findings are highly interrelated with the salience hypothesis, since an unexpected reward received after completion naturally cannot be salient during the activity (Deci & Ryan, 1987).

However, it should be noted that Kohn has pointed out that it does not take much in this world for people to actually expect a reward (Kohn, 1999). If an unexpected reward is received once for a given task or if the person has seen others be rewarded for a similar activity, there may be an expectancy regardless of whether anyone has explicitly promised the reward or not.

Another interesting point was made by Kruglanski, Alon and Lewis (1972) when they conducted a clever experiment. The subjects all participated in a series of games with no expectation of a reward. After the games one group of subjects was given a reward and told that the reward had initially been promised (Kruglanski et al., 1972). Even in this instance the rewarded group showed a subsequent decrease in their interest in the task. This indicates that even if a reward is technically unexpected, it can still have a detrimental effect on intrinsic motivation, if the subject comes to feel that their effort was a result of the reward and not the task.
Contingency

Contingent rewards can generally be thought of as if-then rewards, since the reward is contingent on something. It is an important and much discussed concept that affects whether extrinsic rewards decrease intrinsic motivation or not. One of the reasons for the many discussions on the subject has been that different researchers have used different categorisations. In 1983 Ryan et al. (Ryan et al., 1983) provided a terminology that will be the basis for this discussion of contingency.

Task-noncontingent rewards basically mean that subjects are paid simply for their presence in an experiment. It is similar to getting paid for being on the job, rather than for what is done whilst on the job (Deci & Ryan, 1987; Ryan et al., 1983). Task-contingent rewards are a reward given for actually doing an activity or completing a given task. It is equivalent to the piece-rate system in the workplace. The third term established by Ryan et al. is that of performance-contingent rewards. This type of reward is given when the subject has a certain level of performance compared with a standard (Deci & Ryan, 1987; Ryan et al., 1983). Finally, the term competitively contingent reward refers to circumstances under which subjects are competing for a limited number of rewards (Deci & Ryan, 1987; Ryan et al., 1983).

Studies have shown that task-noncontingent rewards do not reduce intrinsic motivation compared to no rewards (Deci & Ryan, 1987; Deci, 1972a). Multiple studies have proved that task-contingent rewards decrease intrinsic motivation compared to control groups receiving no rewards (Deci & Ryan, 1987).

One of the problems with contingent extrinsic rewards is that they are often given when some quantifiable objective is reached. That this leads people to focus on speed of execution rather than quality comes as no surprise. An example of this is Greene, Nisbett and Lepper, who showed that rewards affect both quality and quantity; finding that children would draw more pictures when a reward was at stake, but that the quality of the drawings diminished significantly (Lepper & Greene, 1978; Lepper et al., 1973). Some researchers have therefore concluded that the problem with rewards is not the rewarding itself, but rather what is being rewarded, arguing that to succeed with rewards they need to be made contingent on quality, the so called performance-contingent rewards.

An inherent aspect of a performance-contingent reward is informative, in that the reward is received when the subject reaches a specific level of performance compared to a standard. However, it is also more controlling than the other types of rewards, since it is not enough to simply complete a task, a certain standard or level of quality must be reached. Even
though the findings are somewhat inconsistent on the subject, Ryan et al. (Ryan et al., 1983) and others have provided credible evidence that performance-contingent rewards do have a negative effect on intrinsic motivation (Deci & Ryan, 1987; Ryan et al., 1983).

Competitively contingent rewards reduce intrinsic motivation compared with a no rewards control group (Pritchard et al., 1977). This has to do with the fact that it is a very controlling type of reward, since doing well is not enough – the subject has to do better than everyone else too. This negative effect of the competition is really strong, as Deci, Betley et al. have proved that this kind of competition in itself reduces intrinsic motivation (Deci et al., 1981). A tendency which is only enforced when a reward is introduced.

To sum up, the contingency factor is very complex in that there are different types of contingent rewards and they all differ in how prominent the information and the control aspect are. As just explained competitively contingent rewards have the highest level of control in that they require subjects to win. Performance-contingent rewards require that the subjects perform better than a specified standard and are thus the second most controlling. Next are the task-contingent rewards, and finally, the task-noncontingent rewards are the least controlling of the contingent rewards. The feedback aspect is most distinct in the performance-contingent and the competitively contingent rewards. The controlling aspect tends to decrease intrinsic motivation, whilst the information aspect enhances it. It is because these two effects work against each other that it is complicated to assess the final effect of the different types of contingent rewards on intrinsic motivation (Deci & Ryan, 1987).

Causality

Weiner’s distinction of causality is that people are either internals or externals (Weiner, 1980). Internals believe that their performance is a result of their ability, whereas externals consider it to be dependent on luck or chance. The hypothesis that was set up and later confirmed was that extrinsic rewards in the form of money will reduce intrinsic motivation for internals. In the experiment the subjects were manipulated to be either internals or externals, in that they were informed by the experimenter that solution of the task they were about to solve was a function of their ability or chance respectively. The findings showed that when people believed they were the cause of the outcome of a task, money had a negative effect on intrinsic motivation. Whereas the opposite was true when people believed successful completion was solely dependent on chance. In other words, if a person perceives the completion of a task as completely beyond their control the negative effect of
extrinsic rewards does not occur (Weiner, 1980). Part of the explanation for this can be found in a study by Philips who concluded that when people feel competent at a task (i.e. they are internals) they are more intrinsically motivated to begin with (Phillips & Lord, 1980). As previously explained, the presence of true intrinsic motivation as a starting point, is a necessity for the undermining effect of rewards to occur.

Feedback

It has already been suggested that feedback will most likely be experienced as informational and therefore, have a positive impact on intrinsic motivation. However, in a study by Deci and Cascio, they found evidence that the effects of feedback (either positive or negative) on intrinsic motivation are not clear-cut. In fact it depends on the level of feedback. If a person receives too much verbal reinforcement he or she may become dependent on it and so it will have the same undermining effect on intrinsic motivation as monetary rewards. If a person on the other hand receives only a little negative feedback it may make the task seem more challenging and thus more intrinsically motivating. It is first when the negative feedback threatens the person’s sense of competence that it decreases intrinsic motivation (Deci & Cascio, 1972; Deci, 1972a).

To sum up, verbal reinforcement enhances intrinsic motivation as long as the subject does not become dependent on it, and negative feedback diminishes intrinsic motivation unless it is in such a small amount that it simply constitutes a challenge to the subject (Deci & Cascio, 1972; Deci, 1972a). Finally, it is interesting to note that a study has found that the negative effect of a monetary reward was negated by the positive effect of positive verbal feedback, so the final effect on intrinsic motivation was evened out when a subject receives both (Deci, 1972b).

Culture

According to Deci and Ryan and the self-determination theory, the needs for autonomy, competence and relatedness are universal, and prerequisites for intrinsic motivation. Others have argued that for example autonomy is a western value, whilst relatedness is more important in collectivistic cultures. Nevertheless, self-determination theory asserts that even though culture most certainly affects the way in which people satisfy their needs, the basic needs are the same across cultural differences (Deci & Ryan, 2008; Gagné & Deci, 2005).
In 2003 Huang & Van de Vliert conducted a study to test whether, and if so which, national attributes affect whether a worker is predominantly motivated extrinsically or intrinsically. According to these two researchers, previous studies have shown that nationality is a strong determinant of whether intrinsic or extrinsic job characteristics are considered most important and valued. Two socio-economic and two cultural predictors were used to find out which aspects of nationality are determining; national wealth, national social security, individualism and power distance (see model in appendix 4). The main conclusion of the study was; “the link between intrinsic job characteristics and job satisfaction is stronger in richer countries, countries with better governmental social welfare programs, more individualistic countries, and smaller power distance countries” (Huang & Van de Vliert, 2003, p. 159). Conversely, extrinsic job characteristics are more strongly related to job satisfaction in poorer countries, in more collectivistic cultures, and in larger power distance cultures. Huang & Van de Vliert include autonomy, challenge, recognition and the work itself as intrinsic job characteristics, whilst job security, pay and working conditions are examples of extrinsic job characteristics (Huang & Van de Vliert, 2003).

Huang & Van de Vliert built their hypotheses around Maslow’s need theory, and in particular the assumption that lower level needs must be satisfied for higher order needs to become salient. People in economically stable countries have a tendency to take survival for granted. Therefore, they tend to focus more on satisfying their higher needs and so they are more motivated by intrinsic rewards as they can help satisfy these higher needs. In contrast, in poorer countries, workers will be more focused on satisfaction of the lower needs. This means that they are more likely to be motivated by extrinsic rewards and job characteristics (Huang & Van de Vliert, 2003).

The argument in relation to national social security is similar to the one for national wealth. In countries with a lacking social security system, people will focus on achieving a sense of security through their job and so they will appreciate extrinsic job characteristics more. Whilst, in countries with well-functioning social security systems, workers can rely on that system and turn their focus to higher order needs and intrinsic job characteristics instead (Huang & Van de Vliert, 2003).

Huang & Van de Vliert’s used Hofstede’s dimensions of culture to show that individualistic cultures value self-esteem highly, a higher order need, which will indicate a higher valuation of intrinsic job characteristics. In collectivistic cultures the community is often put in front of the individual and so a natural consequence is a focus on lower, rather than higher order needs and therefore extrinsic job characteristics are most directly related to job satisfaction (Huang & Van de Vliert, 2003).
The level of power distance in a country influences the type of management that will dominate in that country. If a country has a small power distance, a participative management style and autonomy will be valued in the organisations. Therefore, it is reasonable to expect that in such countries, workers will value intrinsic job characteristics highly. However, in countries with a larger power distance people do not value these intrinsic rewards, in fact they may even be considered pointless and unwanted (Huang & Van de Vliert, 2003).

Furthermore, it is reasonable to expect that workers in a small power distance country will respond more negatively to extrinsic rewards, since they may be perceived as a way for the manager to exert power. This exercise of power may lead the employees to feel a larger power distance within the organisation, something which runs contrary to their cultural beliefs of how it should be (Kohn, 1999).

Huang & Van de Vliert’s study concluded that there is variation in which job characteristics are most related to job satisfaction across different nations, and that national wealth, national social security, individualism and power distance can be used to determine whether intrinsic or extrinsic job characteristics will be most important in a given nation. This means that any manager must pay close attention when determining which job characteristics to focus on to increase job satisfaction. In particular it should be noted that intrinsic rewards may be a waste if the country has a large power distance and poor social security systems (Huang & Van de Vliert, 2003).

Even if this is true, it does not necessarily mean that Deci is wrong when he says that intrinsic motivation is a preferable starting point and that whenever a person is intrinsically motivated, rewards can have a detrimental effect on that motivation despite cultural differences. It just means that people are less likely to be intrinsically motivated in the first place in some countries.
INCONSISTENCIES IN METHODOLOGY

“This field of study is, as yet, embryonic and lacks a clear consensus on fundamental terms and concepts”
- (Lepper & Greene, 1978, p. xii)

As the previous sections show there is still no agreement on whether extrinsic rewards are detrimental to intrinsic motivation or not. This quite naturally means that there has been a lot of critique of both findings that support the hypothesis and those that reject it.

Lao suggested that there were a number of methodological problems with some of the previous research which had concluded that extrinsic rewards decrease intrinsic motivation. There were three main problems according to Lao, the first of which was that the subjects were not truly volunteers, rather they participated in the studies because they had been informed of the rewards involved or were promised course credit for participation. This means that the money may have had an effect on the motivation before the experiments even started. The second problem was that many researchers used a free time measure with limited alternative activities to access intrinsic motivation; according to Lao this may not have been appropriate. The third problem, which was the focus point of Lao’s own experiment, was that the tasks used in previous research were not truly interesting, meaning that they were not really intrinsically motivating (Lao, 1981).

In his experiment Lao started with pointing out to the potential subjects that there would be no course credit or monetary rewards given for participation in the study. Next he used a brainwave biofeedback activity, which had been proven to be very intrinsically motivating. He then gave the subjects either; no money, $2 or $5 on a random basis. The subjects were then asked if they would be interested in participating in another experiment without any payment. It was hypothesised that if the subjects were intrinsically motivated they would come back for the second session. Since there was no difference in the return rate between the three payment groups, Lao concluded that when the task is truly intrinsically motivating extrinsic rewards will not diminish intrinsic motivation (Lao, 1981).

Calder & Staw also criticised the methodology of previous research in support of the hypothesis that extrinsic rewards decrease intrinsic motivation. Most importantly they said that free time behaviour is not the best measure of intrinsic motivation. One of the reasons being that a decrease in time spent on the rewarded activity subsequently may be explained by the fact that subjects will work harder during the experimental session, i.e. when they
are rewarded. This extensive effort may lead the subject to feel satiated or tired, which in turn reduces the time spent on the activity in the free time period. Instead Calder & Staw suggested reported task satisfaction as the most reliable measure of intrinsic motivation, since “one certainly should like a task if he is willing to perform it for no other apparent reward” (Calder & Staw, 1975a, p. 79).

On a similar note different researchers have used different definitions or conceptualisations of what constitutes intrinsic and extrinsic motivation. Some say that it is a matter of whether the motivation stems from the task itself or from something outside of the task (Deci & Ryan, 2008), whilst others believe that it is defined by who administers the reward, i.e. if it is self-administrated or administered by someone else (Kanungo & Hartwick, 1987). When the researchers use different conceptualisations of what constitutes extrinsic and intrinsic motivation and rewards, it is only natural that they may have used different types of rewards as extrinsic and different measures of intrinsic motivation. This will undoubtedly lead to discrepancies in their findings. Additionally, researchers have used different definitions of contingency and creativity and this has for sure led to some confusion in the findings. Specifically different conceptualisations of contingency have been described using the same terms, while what characterised true creativity has differed between studies. The methodological problem with the contingency definitions has, however, been limited since Ryan et al. introduced a standard terminology (Deci & Ryan, 1987; Amabile, 1996; Ryan et al., 1983).

In 1976 Pinder pointed out that even though there was substantial laboratory research which supported de Charms’ and Deci’s hypotheses on the negative effect of extrinsic rewards, field experiments were required to confirm external validity (Pinder, 1976). Deci also pointed to this fact himself as he noted that the lack of organisational studies were one of the reasons why some people remain sceptics of the cognitive evaluation theory (Gagné & Deci, 2005). This gap in research was also identified by Ryan, Mims & Koestner (Ryan et al., 1983) along with the problem that previous research had not compared performance-contingent rewards with rewards that were not dependent on performance levels. Jordan set out to fill these two gaps with a field experiment using both types of rewards. The results confirmed Deci’s findings, and thus it responded to previous critiques saying that the theory would only hold in laboratory settings (Jordan, 1986).
Meta-analyses

Between 1988 and 1999 at least six meta-analyses were conducted by various researchers. The first was carried out by Rummel & Feinberg and included 45 studies. They set out to test whether rewards have a detrimental effect on intrinsic motivation or not, and if Deci’s cognitive evaluation theory (CET) provided a suitable explanation for it. The found support for the effect and the conclusion of their study was; "This meta-analysis lends support to the adequacy of Deci’s CET" (Rummel & Feinberg, 1988, p. 160). They pointed at different operationalisations of the concepts as the main reason for the lack of unanimous support for the negative effect of rewards.

In 1992, Wiersma did a meta-analysis of 20 published studies. The aim of this study was not only to conclude whether the overjustification effect can be empirically supported or not, but more importantly to find out why previous research had not shown conclusive results. The inference from the analysis was that the way intrinsic motivation is operationalised determines whether a negative impact is found or not. More specifically, a free time measure supports the overjustification effect, whereas a task performance measure does not (Wiersma, 1992). Deci later pointed out that Wiersma’s definition of task performance, namely performance during the experimental session, is an unusual measure of intrinsic motivation, which naturally explains Wiersma’s findings (Deci et al., 1999).

When Tang and Hall conducted their meta-analysis in 1995 they evaluated 50 studies to find out under which conditions the overjustification effect occurs. They found evidence of many of the conditions described earlier, such as contingency, expectancy and feedback (Tang & Hall, 1995). Tang & Hall included six measures, but three of these were not appropriate according to Deci, since they were measured during the experimental session, i.e. while the rewards were given. This naturally means that they could not be used to detect a decrease in intrinsic motivation after the termination of the rewards. Furthermore, a measure such as enjoyment of the task during the rewarded experiment, cannot distinguish between satisfaction due to the activity itself and happiness due to the reward (Deci et al., 1999). This once again leads to the conclusion that how one chooses to measure the level of intrinsic motivation is truly a determinant of whether the hypothesis of detrimental effect of extrinsic rewards on intrinsic motivation is confirmed or rejected.

Cameron did a meta-analysis with Pierce in 1994 where both a free time measure and a self-reported attitude measure were included. This meta-analysis was the first to conclude that there was no overall negative effect of extrinsic rewards on intrinsic motivation (Cameron &
The same conclusion was reached by Eisenberger and Cameron in 1996, when they redid the meta-analysis with only minor alterations (Eisenberger & Cameron, 1996). Like Tang & Hall they also included aspects such as expectancy, contingency and verbal versus tangible rewards. However, the findings were highly criticised by other researchers and were said to have several methodological insufficiencies (Kohn, 1999; Deci et al., 1999).

A strong critique point was that nearly 20% of the studies that met the inclusion criteria of the meta-analysis were omitted as outliers. Another problem was that the control groups used in some of the studies were inappropriate, e.g. sometimes there was not a control group which did not receive any reward to compare with. Furthermore, in both meta-analyses the researchers failed to make a distinction between initially interesting and initially boring tasks. Instead they combined the two in the research. This is a problem because the studies with dull tasks were specifically carried out to prove, that intrinsic motivation will not decrease when the task is not intrinsically motivating in itself to begin with. (Deci et al., 1999). Finally, the attitude measure may be considered unreliable, since it may reflect happiness with the reward, in addition to satisfaction from the task itself. All of these methodological issues can be the cause of the results being inconsistent with previous meta-analyses.

Deci, Koestner & Ryan conducted their meta-analysis in 1999 as an attempt to set the record straight once and for all regarding the existence of an undermining effect of rewards. They identified some of the mistakes made in previous meta-analyses and tried to correct them (Kohn, 1999; Deci et al., 1999). First, they included 128 studies including unpublished doctoral dissertations, which had been excluded from all the other meta-analyses. This also gave a substantially larger pool of research compared with for instance Wiersma, who only included 16 published studies and Tang & Hall who included 45 studies. Second, they distinguished between two measures of intrinsic motivation; free choice and self-reported interest. Thus, they acknowledged that there is more than one way to assess intrinsic motivation, but they excluded all measures that could be considered tainted because they were taken during the experimental phase, as per the critique of Tang & Hall.

Third, the three researchers tested different reward conditions to see which effect they had on intrinsic motivation. They ended up with less than 4% of outliers, which indicates a more complete picture than Cameron’s meta-analyses. The examination included differences between verbal and tangible rewards, expected and unexpected rewards, and different types of contingent rewards. Age effect was also examined as studies with children were compared with those using college students. Fourth, they ensured that appropriate control groups were used. Fifth, a distinction was made between studies with interesting versus boring tasks, rather than coupling them as in Cameron’s research (Deci et al., 1999).
Deci, Koestner & Ryan concluded that extrinsic rewards generally have a negative impact on intrinsic motivation. More specifically, tangible rewards for interesting tasks have a significant detrimental impact across a variety of tasks, rewards and subjects. Tangible rewards did not have this effect when they were unexpected or non-contingent. Verbal rewards, also known as positive feedback, were found to increase intrinsic motivation. In their studies they, furthermore, showed that a free-time measure consistently indicated a strong negative effect, whilst the self-reported interest measure indicated a weaker effect (Deci et al., 1999).

To sum up, several meta-analyses have been conducted to find conclusive evidence on whether rewards have a detrimental effect on intrinsic rewards or not, and if so, under which conditions. Most of the articles confirm the existence of the negative effect; however, Cameron’s two meta-analyses reach the opposite conclusion. The main reasons behind the inconsistent results are differences in methodology, and in particular how one chooses to operationalise intrinsic motivation seems to be a strong indicator of the conclusion one will reach; free time measures support the negative effect, whilst self-reported interest shows either a positive effect or none at all.

Having studied the underlying reasons behind the inconsistency in previous research, attention will now be turned to the future and what implications the findings mentioned in this paper have for businesses and their approach to extrinsic rewards.

**IMPLICATIONS FOR BUSINESS**

“For too long, there’s been a mismatch between what science knows and what business does”

- (Pink, 2010, p. 9-10)

To say that rewards are popular in the realm of business is to put it mildly and the assumption that many business leaders are strong supporters and users of external constraints seems fair. In the western world in general the word reward itself seems to carry a positive connotation and businesses are often seen tweaking their incentive systems when they want a job done. To put it boldly businesses are run on the mantra “to solve a problem, you throw money at it” (McGraw, 1978, p. 33). This assumption about businesses is not built on anecdotal evidence alone; in an estimate 75 to 94 percent of U.S. companies use some form of incentive or merit-pay plan and the number is rising (Kohn, 1999).
Why is this? Maybe it is because extrinsic rewards work; we have already established that when the task is either asking for only mechanical skills (Ariely et al., 2009) or can be classified as algorithmic (McGraw, 1978) extrinsic rewards work, especially if we do not care about people’s long-term interest in the task and instead care first and foremost about securing compliance. This might lead to the conclusion that businesses using incentives and rewards to motivate are doing the right thing.

The 21st Century; Intrinsic Motivation in Business

However, if we look at businesses today, and the challenges they face, most tasks seem to be heuristic in nature. This goes beyond the top management level too, as it is widely accepted that the level of complexity of tasks is increasing at all levels. McKinsey supported this in their 2005 estimate that only 30 percent of job growth in the US comes from algorithmic jobs, whereas 70 percent comes from heuristic work (Johnson et al., 2005). This shift in the western world from blue collar industrial workers, faced with relatively simple tasks, to knowledge workers, faced with more complex tasks, appears to be more than just a temporary change and it can be assumed that this development will continue (Pink, 2010). This shift has also led to an added reliance on teamwork, as cooperation among co-workers takes advantages of people’s different skills and perspectives to create the best and most innovative solutions (Kohn, 1999).

As a consequence most business managers these days lead people facing increasingly complex heuristic tasks where the people need teamwork abilities, creativity, curiosity and a thirst for a challenge. Now if only there was a way to encourage these traits and skills...

As it has been presented in this paper; intrinsic motivation facilitates these wanted behaviours, to recap; when intrinsically motivated “people are interested in what they are doing, and they display curiosity, explore novel stimuli, and work to master optimal challenges” (Deci & Ryan, 2008, p. 15). Therefore, the argument that managers should do what they can to foster an intrinsically motivated workforce strengthens. One way of doing this, as has also been demonstrated in this paper, is to stop the reliance on contingent extrinsic rewards, which might foster motivation; however in many circumstances it will turn out to be the wrong type of motivation e.g. leading to no risk-taking, no creativity or exploration and destruction of cooperation between co-workers (Kohn, 1999).
Why Are Rewards Popular In Business?

So if rewards and other external constraints are not needed, what can then be the explanation for their popularity? Part of the reason probably has to do with the fact that they used to work. Following the rise of industry and Taylor’s scientific management in the beginning of the 20th century, it is to some extent understandable that rewards and punishment became so popular. Most jobs were algorithmic and management’s goal was compliance, making for effective use of carrots and sticks.

The problem then becomes that even though businesses have changed radically, incentive systems have only been tweaked. As Whyte put it; the underlying problem with incentive systems is not poor techniques in administering them, but a fundamental flaw with the theory of workplace motivation to begin with (Whyte, 1955). This statement remains, according to the findings of this paper, as true today as it did in 1955.

However, it might be particularly hard for the business world to let go of extrinsic rewards, as the whole idea of paying people according to performance, supports what many believe business and free markets are all about (Kohn, 1999). When rewards in this way have become part of what the company believes in and stands for then dissembling it gets more complicated. Another element making it hard for businesses to let go, is that the rewards already given might have made the workforce extrinsically oriented, and if the people are already used to rewards and intrinsic motivation has already been hurt, then a change would at first not pay off. This might discourage some managers.

Finally, the fact that a total change in the way we approach motivation has not occurred could indicate that it is hard to let go of a system that is very simple and easy to use, administer and understand, in return for a more complex approach. Carrots and sticks for all their faults are an easy, and often effective, solution to problems in the here and now.

New Approach

A new approach to motivation needs to be found. This is a challenge since an underlying assumption of most motivation schemes is that rewards and punishments are the only available means (Kohn, 1999). This is unfortunate as both are flawed and because the approach assumes that external forces are needed to make people interested in their job. However, if “all of us start out in life intensely fascinated by the world around us and inclined
The Surprising Consequences of Extrinsic Motivation

The Interaction between Intrinsic and Extrinsic Motivation a Literature Review

to explore it without any extrinsic inducement” (Kohn, 1999, p. 91), the question are external rewards really always necessary? can be raised. Some might say that a job is different and not something people enjoy and find interesting, however, Csikszentmihalyi’s several studies on motivation proved this wrong. He showed that the great majority of the moments of complete absorption and unselfconscious pleasure happen at work and not leisure (Csikszentmihalyi & LeFevre, 1989). Understanding that people usually start out motivated, the new approach to motivation can start to take form.

Managers need to change their thinking
Deci, Amabile and Pink among others have all come to the conclusion that the underlying problem is that managers are focusing on how they can motivate their employees, with the tools they have, e.g. carrots and sticks, instead of taking a step back and instead creating the circumstances in which the employees can motivate themselves (Pink, 2010; Amabile, 1996; Gagné & Deci, 2005). Therefore, the new approach being suggested urges managers to stop asking themselves how they can motivate people, because intrinsic motivations is not something that can be imposed from the outside (Kohn, 1999). The focus should instead be on how to create the best conditions under which intrinsic motivation can flourish (Kohn, 1999; Pink, 2010). If we support the belief that people are naturally prone to seek development and achievement, then the advice for managers more specifically must be to provide these opportunities within the companies. To sum up; to live up to this new approach the role of managers is not simply to stay out of the way, but to actively create the structure that will support the workers intrinsic needs.

Alternatives
There are several alternatives to reward schemes in businesses, however, the problem is that there is no one-best way. So far no prescriptive model, that suggests the alternative to rewards, has been created and therefore no clear solutions can be given. This might be because each situation needs to be analysed by itself, to find out what the goal is and what, if anything, is needed instead of a reward for the goal to be reached (Kohn, 1999).

Even though a universal solution has not been created, this does not mean that the writers on this subject have not attempted to come up with some recommendations for what to do instead to motivate, let us look at some of this advice, which has not already been discussed.

In his 2010 bestseller Daniel Pink gives his suggestions for what needs to happen in order for people to be intrinsically motivated. The three elements he speaks of are autonomy, mastery and purpose. Autonomy is the need to decide what task should be solved and how, mastery is the wish people have to become good at something, and purpose encompasses the wish to see a greater meaning in our actions. The alternative to the management here
becomes to add freedom, challenges and responsibility to jobs and then work to create a mutual relationship of trust (Pink, 2010).

Kohn mentions many of the same elements and argues that to enhance work motivation increasing the levels of responsibility, meaningfulness and feedback that are built into the jobs will be helpful (Kohn, 1999). The overall aim here is to make the work more rewarding in itself. Hackman and Oldham created their job-characteristic model around this same goal, suggesting that people need to experience meaningfulness, responsibility and knowledge of the actual results of their jobs to be intrinsically motivated (Buelens et al., 2010).

Taking advice from Deci’s work, managers could furthermore attempt to make the extrinsic constraints they use as informational as possible, as opposed to controlling. Furthermore, the manager’s could attempt to use extrinsic constrains that the employees can internalise, as Deci and Ryans’s self-determination theory showed; extrinsic constraints can be internalised to varying degrees, the more internalised, the closer it comes to intrinsic motivation (Ryan & Deci, 2000).

**What to do about uninteresting jobs**

If this is the advice for jobs which are interesting or can be designed to be so, what can be done with the type of jobs that many believe can never be intrinsically rewarding? Studies show that intrinsic motivation is less important when performing mundane algorithmic tasks, however, trying to inspire this type of motivation might still be worthwhile as it is associated with greater job satisfaction and well-being (Tremblay et al., 2009; Gagné & Deci, 2005).

For a suggestion on how to make uninteresting work more interesting to the employees we turn to Deci’s three pronged approach, which entails: acknowledge candidly that the task might not be very interesting, offer a meaningful reasoning for why it has to be done, and finally give the person as much control over how to solve the task as possible (Gagné & Deci, 2005).

**Take the issues of money off the table**

All the critique of extrinsic rewards and the alternative approaches have often been misinterpreted to saying that money is not important - this is not true. In our review there has been a consistent belief that money is an important part of working-life and that people working of course want and need to be paid (Kohn, 1999). The idea is simply to pay a generous, fair and equitable salary, and thus take the issue of money off the table (Pink, 2010), while dropping the contingent pay/reward schemes. In other words; “the trouble is not with money per se but with the way people are made to think about money” (Kohn, 1999, p. 183). The underlying belief is simply that even though the lack of money, e.g. too
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low salary, can be de-motivating, it does not follow that money in itself can be a motivator. This view is also supported by Herzberg’s two-factor theory (Buelens et al., 2010).

Future Implications: What Needs To Happen?

In reviewing the literature on the subject of extrinsic motivation’s effect on intrinsic motivation, a strong case for why businesses should revise their incentive and pay-for-performance schemes has been made. In this section so far we have looked at some of the alternatives, but also cautioned why it might be particularly hard for businesses to change their approach. There is, however, one more reason why businesses have not changed their ways; they are not aware of the problem.

Even though the studies proving that rewards and other external elements reduce intrinsic motivation seem to be endless, it appears as if they have not managed to become part of generally accepted management or organisational theory. In Kohn’s words the problem is pronounced “the central finding has been documented beyond any reasonable doubt. Remarkably, however, it is not widely known even in the neighbouring fields of educational and organisational psychology, much less in the culture at large” (Kohn, 1999, p. 71).

The problem seems to be that many of the findings have not been published outside of social psychology. As the authors of this paper found when looking for material, most articles came from journals related to psychology and most books were sourced from the institute of psychology within the university. With a topic as important to business as motivation, it is a real shame that these particular findings have not been embraced in more areas.

Deci did manage to get a paper in a journal of organisational behaviour, Kohn has both been published in the Harvard Business Review and appeared on Oprah to speak about the effect, while a video of Pink speaking about the effect has had over 5 million views, impressive seeing as it is a remake of the original speech he did for TED (Kohn, 1999; RSA Animate 2010; TED 2009). This shows us that some of the information has been exposed to a wider audience, however, seeing as the effect has been well-documented since the 1970’s, the knowledge still seems scarce outside the realm of psychology and this may have led managers to believe that the findings were only a fluke (Kohn, 1999).

Another reason why business leaders might have been reluctant to fully embrace these findings could have to do with them being bombarded with business journal articles about how to improve pay-for-performance schemes and new ways of designing reward systems,
making it hard to believe that the schemes really have such a serious and basic flaw (Kohn, 1999).

There are, however, also reasons to be positive about the future. It is our prediction that Dan Pink’s book and very popular internet videos will do, and already have done, a lot to spread the word. Furthermore, companies have had success with offering autonomy and meaningfulness to their employees, instead of using external constraints, and these success stories might be a powerful tool in making companies see that the alternatives to rewards work in practise.

Knowledge spill-over
There are furthermore signs that knowledge from social psychology has started to spill over into other areas. An example of this is Irlenbusch from London School of Economics finding in his 2006 paper, that extrinsic rewards such as performance contingent payments can reduce intrinsic motivation and that contingent rewards in general brings several problems with them (Irlenbusch, 2006). And Ariely et al, publishing their article in the Review of Economic Studies in 2009 showing that the larger the reward, the bigger are the mistakes (Ariely et al., 2009). And last but not least Bénabou and Tirole (2003), who have attempted to reconcile the psychology and economic views of rewards. Something that is not easy as; “a central tenet of economics is that individuals respond to incentives”, whereas the opposing view of psychologists and sociologists is that “rewards and punishments are often counterproductive” (Bénabou & Tirole, 2003, p. 489). However they found that in reality the negative effect of rewards is quite rational, and can be explained in mathematical terms and they conclude that “incentives are then only weak reinforcers in the short run, and negative reinforcers in the long run” (Bénabou & Tirole, 2003, p. 489).

This shows that there are reasons to be optimistic about the future; even though companies are not lining up to dispose of their extrinsic incentive systems, there are signs that the negative effect might slowly become an accepted finding in economical theory, while business people in general can learn about the effect though Dan Pink’s book written with the very clear objective; to make the case against rewards known to businesses.
IMPLICATIONS FOR FUTURE RESEARCH

“It must still be determined whether the impact of a contingent pay schedule is harmful in real organizational settings”
- (Pinder, 1976, p. 699)

The gap between what researchers already know and what businesses do is a good starting point for future research. Obviously, managers have not been completely convinced and one of the main reasons for this is that most of the research, that supports the hypothesis that extrinsic rewards can decrease intrinsic motivation, has been conducted in laboratory settings using either children or students at different levels as subjects. Future research must focus on making the experiments more closely related to real life work situations; i.e. test the theory in field experiments, in real companies and using actual adult workers as subjects. This kind of experiment would naturally be more extensive, expensive, and risky than previous approaches. Furthermore, they will have a tendency to be very company specific, which makes it hard to generalize findings, and this is probably why such experiments have been so limited. However, it appears as if they are necessary for business leaders to really accept the implications of using extrinsic rewards.

Additionally, the relatively new self-determination theory needs further validation in both experimental and real life settings. If the internalisation hypothesis of this theory is confirmed, it has implications for how the different types of motivation should be perceived.

When testing the theory in a more realistic setting, researchers should also attempt to make some kind of comparisons between companies that focus on extrinsically motivating their employees, and those that focus on intrinsic motivation. These examinations should focus both on employee motivation, employee satisfaction, but also on their performance. Because, when it comes down to it most managers are concerned primarily with the performance of their employers, and less so with what type of motivation they are experiencing, which is why research is required to determine if there is a difference in performance depending on how the employee is motivated. Once again, these results would probably be considered most reliable if they were found by testing the mentioned measures at existing companies. This type of research is important, because even though an increasing number of companies are becoming more ethically and socially responsible, it still always comes down to the bottom line. And thus, for managers to accept that rewards can have a negative effect, they need to be able to see this impact.
In addition to providing more reliable evidence of the detrimental effects of extrinsic rewards, further research is needed to test what will actually happen when bonus systems are removed from organisations. de Charms hypothesised that under some circumstances “the motivation to perform a task undertaken originally in order to obtain an extrinsic reward will be enhanced if the reward is withheld” (de Charms, 1968, P. 329). In other words, he suggests that motivation will increase when rewards are removed. If we look at expectancy theory or Herzberg’s two-factor theory we find quite the opposite opinion; namely, that if a reward is expected and then not received, motivation will decrease. A more optimistic view comes from a field study which tracked productivity in a company where the reward system was discontinued. As expected, at first production did suffer, however, after just one month productivity began to rise and eventually reached a higher level than it had under the incentive system (Rothe, 1970). Even though this field study did show that the possible negative effect of discontinuing a reward system may be overcome, more research is required since this hypothesis has not received that much attention yet.

In relation to what happens when rewards are removed, the effects of the alternatives to rewards must also be tested thoroughly. For instance, research should be conducted to find out more about how autonomy affects both motivation and performance. Furthermore, companies can choose to use a motivational approach in which they focus on both extrinsic and intrinsic motivation, e.g. where bonuses and autonomy go hand in hand. Additional empirical documentation for how this combination will affect the different types of motivation and performance should be identified. Along with, more research on the specific circumstances that affect how the interaction between extrinsic and intrinsic motivation occurs is also desirable.

Finally, this motivational knowledge needs to be integrated in to economical, organisational and management literature to clarify the relations and how it should be applied in business settings. This could be done by researchers within these fields taking up this motivational topic in their own studies.

In summation what is needed is; more field research, comparative studies of companies with different approaches to motivation, empirical studies showing the beneficial effect of intrinsic motivation to businesses, further investigations in the effects of discontinuing reward systems, and validation of the self-determination theory.
CONCLUSION

“It is not level of motivation that is important in driving behavior as a leader, but rather the nature of motivation.”

-Jones 2010

When first deciding to write a theoretical paper regarding extrinsic and intrinsic motivation we were puzzled by the idea that extrinsic means could have a de-motivating and harmful effect. However, as the paper progressed a much more perplexing finding was how accepted this idea is within the academic world and how little it is in the practical realm of business.

In this review we started by looking at the background of extrinsic versus intrinsic motivation. Here it was found that the understanding of intrinsic motivation, as a special type of motivation, can be traced back to 1890, however, it would take a long time before it was accepted as a distinguished human drive. It was, furthermore, shown that cognitive-dissonance theory from 1957 laid the foundation for the theories that what would later show the counterintuitive effect of rewards. The theories of the negative effect, such as cognitive evaluation theory and overjustification were established within social psychology in the 1970’s.

Even though much research illustrating the detrimental effect of rewards has been carried out, it can be shown that the use of rewards is still very popular in society. The idea, favoured by behaviourists, that reinforcements are the best way of motivating seems to be accepted in general, possibly because they are easy to use and effective in the here and now. Other than society at large, the proponents of an additive relationship between extrinsic and intrinsic motivation are several classic motivational theories, many of which do not even distinguish between different types of motivation and therefore do not allow for a more complex relationship. Furthermore, several studies, including a 1994 meta-study have also supported a predominantly positive relationship.

The researchers believing in a more complex relationship between intrinsic and extrinsic motivation have, however, found that under many circumstances rewards are damaging to motivation. Why this subtractive effect occurs has been the focus of countless studies and the researchers, often psychologists, have found that the reasons are many. In this review the following consequences have been discussed; rewards change people’s focus from task to reward, rewards devaluate the task, rewards can be experienced as controlling and
change people’s approach; making them risk averse, less cooperative and less creative. All these negative effects either play a part in crowding out intrinsic motivation or happen as a result of low intrinsic motivation. Arguing further against the reliance on extrinsic incentives, rewards have been criticised for only having a short term effect and when rewards are used to control, they can be accused of being unethical.

In this review it was concluded that the best way of viewing motivation is to understand that type matters and to acknowledge that the interaction between extrinsic and intrinsic motivation is complex, with neither the subtractive nor the additive approach telling the full story. From this complex view it can be seen that the success of rewards depend on several conditions and ultimately on how the reward is perceived.

The disagreement and inconsistency that does exists within this field of research appears to stem from a difference in methodology, more specifically there seems to be inconsistency in how intrinsic motivation is measured leading to different results and conclusions. However, as already mentioned, one of the things that surprised us most in this review was how unchallenged the negative effect of external rewards was. Other than finding many who ignore the subject, few who contested and were able to support it with empirical studies were found.

Therefore, the question of why businesses have not done more to discontinue their incentive schemes remained a mystery. In this paper we have argued for the fact that businesses have been reluctant to change their way for the following reasons; rewards used to work when jobs were simpler, rewards are easy to use and effective in the short term, the alternatives to rewards are complex, businesses are built on a philosophy that responds to the pay-for-performance idea and finally, many are not aware of the negative effect as research has been somewhat confined to the field of social psychology. However, a strong caution goes out to the business world; if creativity, teamwork and employees able to make complex decisions are what is needed, then pay well, but stop relying on contingent rewards. Instead an approach where the focus is on creating the circumstances in which people can motivate themselves is suggested.

What is needed now, within this field of research, is more practical empirical studies carried out in businesses, away from laboratories, preferably with a mix of researchers from differing fields, such as economics, organisational theory and management. Field studies showing that there is an economical gain or loss when focusing on intrinsic motivation as opposed to extrinsic, we believe, will go the furthest in proving or disproving the effect once and for all.
LIST OF REFERENCES


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APPENDICES

Appendix 1: Porter and Lawler’s Expectancy Model

(Brooks, 2009, p. 85)

Appendix 2: Soma Puzzle

(Pink, 2010, p. 5)
Appendix 3: The Candle Problem

(Pink, 2010, p. 42-43)

Appendix 4: Model of National Moderators on Intrinsic Motivation

(Huang & Van de Vliert, 2003, p. 161)