

Ongoing Discussion “Thought Piece”

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The Trouble with Incentives: They Work

Gipsie B. Ranney

Years ago, my friend and colleague, David Chambers, told me a story about a consulting visit he and W. Edwards Deming made to a plant of a company that made shoes. The plant manager reported proudly that he had sent one of the quality inspectors home for a week without pay. Inspectors were paid weekly according to the number of pairs of shoes they inspected. When an inspector found defects in a pair of shoes, they were required to repair the defects before they could go on to inspect the next pair of shoes. So, the more defects found, the fewer pairs inspected, and the lower the weekly paycheck. The plant manager said they had discovered that this particular inspector knew which production workers consistently produced shoes with fewer defects, and the inspector had been getting shoes made by only those workers to inspect. This was the reason the inspector was being punished with a week without pay. Dr. Deming told the plant manager that he – the plant manager – should have been the one sent home. He said the plant manager was the one who had created the system that led to the bad behavior and so was responsible for it. In this case, an incentive was put into place that had an unintended effect and the plant manager did not see that he had created the circumstances that led to that effect. The title of this discussion might be expanded to say incentives work, but often they work in unintended ways – hence, the trouble with them.

The use of incentives, particularly in the arena of executive pay, is of particular interest given the current economic situation. A December 30, 2009 article in the *Wall Street Journal* described the Christmas letter to investors by Guy Hands, founder of Terra Firma Capital Partners, a buyout firm.¹ Hands' letter said, "It cannot be right to continue with a system which allows risk to be taken in the knowledge that, if things go right, bankers will take on average 60% to 80% of the profits generated through compensation and, if they go wrong, shareholders and ultimately the Government will pick up the costs." This is just one example of the kind of outrage currently being expressed about executive compensation.

Some Background

In his landmark paper, "One More Time: How Do You Motivate Employees," Frederick Herzberg made a distinction between motivation and movement. In a retrospective commentary, Herzberg wrote,

*The first part of the article distinguishes between motivation and movement, a distinction that most writing on motivation misses. Movement is a function of fear of punishment or failure to get extrinsic rewards. It is the typical procedure used in animal training and its counterpart, behavioral modification techniques for humans. Motivation is a function of growth from getting intrinsic rewards out of interesting and challenging work.*²

It appears to me that when managers talk about motivating people, they are probably not referring to creating conditions in which intrinsic motivation can flourish, but rather they are talking about ways to manipulate behavior. Of course, this is obvious when one considers the subject and the object of the verb motivate in Herzberg's title. One commonly used type of behavior manipulation is incentives.

¹ Mawson, James, "Terra's Guy Hands Sees Power Shift to East," *Wall Street Journal*, December 30, 2009. Retrieved from <http://online.wsj.com/article/SB10001424052748703510304574625812163733496.html>

² Herzberg, Frederick, "One more time: How do you motivate employees?" *Harvard Business Review*, 65(5), September-October 1987.

An important source of arguments in favor of incentives for executives is Principal – Agent Theory in economics. In the *Bulletin of Economic Research*, Rees describes the type of problems the theory is intended to address as follows:

*A large and interesting class of problems in economics involves delegated choice: one individual has the responsibility for taking decisions supposedly in the interests of one or more others, in return for some kind of payment. Examples are a manager running a firm on behalf of its shareholders, an employee working for an employer, an accountant handling the tax affairs of a client, an estate agent selling someone's house, an investment advisor administering a trust fund or share portfolio, a public policy maker, and so on.*³

Rees goes on to describe examples of principal – agent problems and their solutions.⁴ The theory and the solutions are mathematical. Several of the examples involve the use of incentives to obtain the “optimal” solution (optimal mathematically). A basic assumption in the examples is that the agent is “economic man” – he acts in his own best interests. (I note that this is best interests as he sees them economically; I wonder whether economic man appreciates the structure and dynamics of systems or the importance of long-term as well as short-term considerations.)

Rees provides a cogent discussion of the theory as it existed when he published his summary in 1985, but two things about this theory cause me to question its direct application. First, I know that the papers that get published in the mathematical sciences deal with problems that can be solved, not necessarily problems that actually exist. Generally, it may be so that the actual problems in context are simply too complex to solve and/or include numerous non-quantifiable factors. In some situations, we can still use the solved problems for guidance in the real world, provided we are aware of the potential differences between the real situation and the solved problem as described and we understand clearly the assumptions made to address the problem. Second, I am reminded of Deming's masterful discussion of different “worlds” of purchasing (see the Appendix to the Second Edition of *The New Economics*). In that discussion, Deming said, “Any theorem is true in its own world. But which world are we in? Which of the several worlds makes contact with ours? That is the question.”⁵ The mathematical treatment of agency relationships is correct, given the assumptions and the mathematical formulation, but the question is whether the assumptions apply to the world we're in. I seriously question the applicability of the “economic man” model in the real world if one takes the position that decisions often involve consideration of the effects of the decision on affected parties now and in the future. I believe this concern has led to the frequent publication of papers on the “stakeholder” view of the firm in contrast to the purely economic/financial view.

My friend, Ian Bradbury, quoted to me the following paragraph from a microeconomics textbook:

*If monitoring the productivity of workers were costless, the owners of a business could ensure that their managers and workers were working effectively. In most firms, however, owners can't monitor everything that employees do – employees are better informed than owners. This information asymmetry creates a principal-agent problem.*⁶

Ian commented as follows:

As I think about this introductory paragraph, it certainly has imbedded the assumption of (Skinnerian) Rational Economic man. It also makes you wonder how they think it

³ Rees, Ray, “The Theory of Principal and Agent Part I,” *Bulletin of Economic Research*, 37(1), 1985, p.3.

⁴ The second part of Rees' summary of Principal and Agent Theory appears in volume 37, issue 2 of the *Bulletin of Economic Research*.

⁵ Deming, W. Edwards, *The New Economics*, 2nd Ed., MIT Press, 1994, p. 227.

⁶ Pindyck, R.S. and Rubinfeld, D.L., *Microeconomics*, 5th Ed., Englewood Cliffs, NJ, Prentice Hall, 2001.

*might be if you could, in fact, monitor employee effectiveness for free. Are they thinking there's some one-dimensional measure of effectiveness and that it would be known whether an employee was operating at their peak? If (as would really be the case) effectiveness were to be viewed across many interdependent dimensions, what would peak effectiveness mean then? Supposing one could actually measure the deviation of effectiveness from the optimum, then what? It seems as though the belief may also be that the cause of the deviation could be nothing other than (lack of) employee motivation/effort and that knowledge of the lack of optimal performance would be sufficient for knowing how to "fix" the problem.*⁷

Anyone who has studied organizations as systems would agree with what Ian has said. I tend to believe that what the economists have done is to solve a solvable problem rather than one that actually exists in our world. In our world, meaningful and reliable measurement of performance, definition of optimal performance and diagnosis of causes for lack of "optimal" performance are typically difficult, if not impossible or nonsensical.

A telling sentence from the same book says, "When it is impossible to measure effort directly, an incentive structure that rewards the outcome of high levels of effort can induce agents to aim for the goals that the owners set." How do we know the relationship between this "outcome" and the level of effort, independent of the system in which the organization operates? How do we know the relationship between the "outcome" and the complexities of the organization itself? I believe this is a task for deities, rather than all-too-human designers of incentive plans.

An interesting paper published by Chip Heath about ten years ago deals with what he calls "lay theories of motivation."⁸ He contends that these theories are used, rather than the work of theorists of individual motivation, to develop the content of the "deal" between the individual (the agent) and the organization (the principal). He proposes that lay theories of motivation are biased toward believing others are more extrinsically motivated. He calls this the "extrinsic incentives bias." With this bias, systems of reward would likely be weighted toward incentives. Heath conducted several studies that supported his view. However, they were all done with MBA students, so the question of whether his position applies to the rest of our society is still open. It appears to me that some of the writings about the principal – agent problem in the finance discipline contain the extrinsic incentives bias, particularly with regard to the CEO as agent for the stockholders. I have wondered whether the escalation of pay, perks and parachutes for CEOs actually tends to attract individuals who are primarily extrinsically motivated, rather than individuals who are seriously interested in creating value. Several recent examples appear to be consistent with this view.

A paper done with the support of the Federal Reserve Bank of Boston by behavioral economist Dan Ariely and his colleagues describes a set of experiments with some very interesting results.⁹ The experiments were done with villagers in India and American students, so the same question of how far the results can be extended arises. Nevertheless, the experiments provide counter-examples to prevailing thought about incentives or, more generally, pay for "performance." (I put the word performance in quotation marks to note that Deming contended that performance of an individual cannot be measured independent of the system in which they work. In the following, I will use the

⁷ Dr. Ian S. Bradbury, personal communication, January, 2010.

⁸ Heath, Chip, "On the Social Psychology of Agency Relationships: Lay Theories of Motivation Overemphasize Extrinsic Incentives," *Organizational Behavior and Human Decision Processes*, 78(1), 1999, 25-62.

⁹ Ariely, Gneezy, Loewenstein, and Mazar, "Large Stakes and Big Mistakes," Working Paper No. 05-11, Federal Reserve Bank of Boston Research Center for Behavioral Economics and Decision-Making, July 23, 2005. Retrieved from <http://www.bos.frb.org/economic/wp/wp2005/wp0511.pdf>

word without quotation marks.) To introduce the experiments, Ariely states, “Workers in a wide variety of jobs are rewarded for their effort based on observed measures of performance.” He goes on to say, “The expectation that people will improve their performance when given high performance-contingent incentives rests on two subsidiary assumptions: (1) that increasing performance-contingent incentives will increase motivation and effort, and (2) that this increase in motivation and effort will result in improved performance. The first assumption, that transitory performance-based increase in pay is increasing motivation and effort, is generally accepted ..., although there are some notable exceptions. ... Although there appear to be reasons to question the generality of the first assumption regarding the positive relationship between effort and pay, our focus in this paper is on the second assumption.” (At the risk of being annoying, I note again that the “motivation” here is extrinsic.)

Ariely notes, “Unlike the relationship between motivation / effort and pay, the relationship between motivation / effort and performance has not attracted much attention from economists, perhaps because the belief that motivation improves performance is so deeply held.” To support the notion that this belief may not always be correct, Ariely cites some findings from the research literature. One finding has been “When performance on a task relies on highly practiced, automatic skills, increasing awareness, competition, introducing a cash incentive or audience or ego-relevant threats (the belief that a task is diagnostic of something one cares about, such as intelligence) can cause people, involuntarily, to consciously think about the task, shifting control from ‘automatic’ to ‘controlled’ processes that are less effective.” He cites examples from sports where this “choking under pressure” phenomenon occurs. He also reports that “increased motivation tends to narrow individuals’ focus of attention, and creativity and insight require drawing unusual connections ... In addition to the narrowing of attention, large incentives can simply occupy the mind and attention of the laborer, distracting the individual from the task at hand.” Is it possible that large incentives can occupy the minds of executives, leading to a focus on making the numbers that govern their incentives and consequently reduce their creativity and insight?

In their first experiments, Ariely and his colleagues included tasks some of which “drew primarily on motor skills, some that drew primarily on concentration, and some that drew primarily on creativity.” However, all required “at least some strategy and cognitive effort.” In their first experiment, the experimenters compared performance for three payment conditions: low; medium; and high (three levels of incentive pay). They observed that “performance of participants was always lowest in the high-payment condition when compared with the low- and mid-payment conditions...” In their second experiment, the researchers compared two types of tasks – one that required “cognitive resources and effort” and another that required “only pure physical effort, without any need for cognitive resources.” They concluded that “Tasks that involve only effort are likely to benefit from increased incentives, while for tasks that include a cognitive component, there seems to be a level of incentive beyond which further increases can have detrimental effects on performance.” Think about the implications of these conclusions. How many purely physical tasks do workers (and managers) perform? It appears that as we raise the stakes higher, the effects on knowledge workers could be just the opposite of what economists and armchair psychologists might think.

The authors conclude that their results “challenge the assumption that increases in motivation [extrinsic] necessarily lead to improvement in performance.” They go on to say, “Do administrators who are in charge of setting compensation have greater insight into such effects? The prevalence of very high incentives contingent on performance in many economic settings raises questions about whether administrators base their decisions on empirically derived knowledge of the impact of incentives or whether they are assuming that incentives enhance performance.”

These conclusions cause one to question even further whether the mathematical formulations of Principal – Agent Theory can be applied without reservation to the world we’re actually in. Creating “performance”-based incentive programs to improve “performance” may produce effects that were never intended.

In his paper, “On the folly of rewarding A, while hoping for B,”¹⁰ Steven Kerr writes, “...numerous examples exist of reward systems that are fouled up in that the types of behavior rewarded are those which the rewarder is trying to discourage, while the behavior desired is not being rewarded at all.” He cites examples of “fouled up” reward systems in politics, war, medicine, universities, consulting, sports, government, and business. Two of the reasons for these fouled up systems are: “fascination with an ‘objective’ criterion” and “overemphasis on highly visible behaviors.” In discussing the first of these, Kerr says, “Many managers seek to establish simple, quantifiable standards against which to measure and reward performance. Such efforts may be successful in highly predictable areas within an organization, but are likely to cause goal displacement when applied anywhere else.” Given the work of Ariely and his colleagues, I would be inclined to extend the statement to all parts of the organization.

A destructive myth that is alive and well today in organizations is the notion that if you can’t measure it, you can’t manage it. I have even seen that statement attributed to Deming in spite of this statement in *The New Economics, 2nd Edition*: “It is wrong to suppose that if you can’t measure it, you can’t manage it – a costly myth.”¹¹ In discussing overemphasis on highly visible behaviors, Kerr observes that “Difficulties often stem from the fact that some parts of the task are highly visible while other parts are not... Team-building and creativity are ... examples of behaviors which may not be rewarded simply because they are hard to observe.” To address the problems of reward systems, Kerr recommends that managers “explore what types of behavior are currently being rewarded... undesirable behavior by organizational members ... may be explained largely by the reward systems in use.”

In connection with the re-publication of Kerr’s paper, the editorial staff of *Academy of Management Executive* conducted a poll of executives to find out whether Kerr’s folly was still at work. They reported, “Ninety percent of our respondents told us that Kerr’s folly is still prevalent in corporate America today.”¹² (Although the poll was conducted in 1995, I can think of no reason why things would have changed in the interim.) The editors identified three themes in the responses given about formidable obstacles to dealing with the folly:

1. *The inability to break out of the old ways of thinking about reward and recognition practices. In particular, there appears to be a need for new goal and target behavior definition, including non-quantifiable behavior and that which is system focused rather than job or functionally dependent... [I note that the executives appear to have gotten some of the message about inappropriate goals and targets, but not all of it. Goals and targets can go awry as well.]*
2. *Lack of a holistic or overall system view of performance factors and results. To a great extent, this is still caused by organizational structures that promote optimization of sub-unit results at the expense of the total organization.*

¹⁰ Kerr, Steven, “On the folly of rewarding A, while hoping for B,” *Academy of Management Executive*, 9(1), 1995 (originally published in *Academy of Management Journal*, 18, 1975).

¹¹ Deming, W. Edwards, *The New Economics, 2nd Edition*, MIT Press, 1994, p.37.

¹² “More on the folly,” *Academy of Management Executive*, 9(1), 1995.

3. *Continuing focus on short-term results by management and shareholders.* [I note here that the managers and shareholders should probably be joined by market analysts and mutual fund managers.]

An important issue with regard to incentives is possible effects on teamwork and cooperation. If the incentive system is set up as a zero-sum game, then for me to win, you have to lose. This is a very effective way to ensure that there is little or no teamwork or cooperation. Interactions between individuals and groups are likely to become negative, to the detriment of the organization as a whole. When incentives are based on narrow functional objectives, achieving those objectives may guarantee that the system as a whole will be suboptimized. One of my favorite examples is the food company that had numerous products that had been on the market a long time and were generally successful, but the existing market was fairly well saturated. To meet sales objectives, the sales group would stage sales promotions in grocery stores. Since the products had a fairly long shelf life, customers quickly learned to wait for a promotion and then stock up. The result was to introduce more variation into sales volumes. The manufacturing group had to cope with this increased variation, as did purchasing, human resources, the financial function, and others. Manufacturing's reaction to increased variation was to build warehouses to buffer the manufacturing activity from the variation. Management and storage of the additional inventory increased costs. The net outcome for the whole organization was increased costs, while selling the products for less, a sure way to reduce profits. It seemed to me that the use of narrow functional objectives and a reward system that enforced them was an important source of the problem.

Other potential effects of incentives are lowered risk-taking, increased conformance, and less exploration and creativity. At a time in the life of our world when we are in serious need of creativity and innovation, can we afford to have incentive systems that will get in the way?

Some Examples

We probably all know that stacking up examples is not a way to prove the correctness of a theory, but I hope you will bear with a few as illustrations.

Robert Rodin described the effects of reward systems in his company, Marshall Industries – an electronics distributor, in his book, *Free, Perfect, and Now*. His list of behaviors inside his company with the existing systems of rewards included the following:

- *Our salespeople would ship ahead of the schedule to make a number or win a prize...*
- *We held customer returns. We had to make sure that the returns coming in did not get counted against sales in the period for which we were trying to hit the numbers. So, if a customer returned items, sometimes our salespeople would put them in the trunks of their cars and keep them there for a few weeks until they could be counted as returns for next period. In the meantime, if we needed that inventory for another customer, we'd have to buy unnecessary stock.*
- *We opened bad credit accounts. Any order was a good order as far as a sales person paid on gross profit was concerned. Just book it.*
- *We found extraordinarily creative ways to charge expenses to one another's profit and loss statements...*
- *Our divisions hid inventory from one another...our managers devised creative ways to hide the inventory they wanted to hold on to for their own customers, sometimes*

*even sending it out of state in UPS trucks so that they could honestly tell other divisions they were out of stock. When their own customers needed the inventory, though, it would magically reappear...*¹³

It is clear that the reward systems in Marshall – commissions, incentives, prizes, contests – were driving those kinds of behaviors. The important statement, “people act rational to the systems we create,” is often attributed to Rodin. The shoe inspector at the beginning of this discussion was acting rational to the system. At Marshall, Rodin took action as CEO to change the reward systems, including putting the sales force on salary. I am reminded of an interchange I had with a young salesman at an electronics retailer. I asked him a question that indicated I doubted what he had just said. He drew himself up to his full height and said, “I’m on salary here, not on commission. What possible reason would I have to lie to you?”

In an article published in *The New Yorker* last June, Atul Gawande describes his search to discover why McAllen Texas is “one of the most expensive health-care markets in the country.”¹⁴ Medicare spends nearly double the national average per enrollee in McAllen and also double what is spent in El Paso County, Texas, even though the two Texas communities have nearly the same demographics. Gawande reports that the difference in costs between McAllen and El Paso was the “across-the-board overuse of medicine” in McAllen. For example, Medicare data revealed that in 2005 and 2006, when compared with El Paso, patients in McAllen received “twenty per cent more abdominal ultrasounds, thirty per cent more bone-density studies, sixty percent more stress tests with echocardiography, two hundred per cent more nerve-conduction studies to diagnose carpal-tunnel syndrome, and five hundred and fifty per cent more urine-flow studies to diagnose prostate troubles, ... one-fifth to two-thirds more gallbladder operations, knee replacements, breast biopsies, and bladder scopes, ..., two to three times as many pacemakers, implantable defibrillators, cardiac-bypass operations, carotid endarterectomies, and coronary-artery stents ... five times as many home-nurse visits.”

There is troubling information in the paper, indicating that more care is generally not better quality care and patients in high-cost areas tend to get more costly tests and procedures and less preventive services. The healthcare outcomes were no better in McAllen than in El Paso. One of the possible explanations that Gawande pursued was that doctors were simply practicing defensive medicine – ordering more tests and procedures to avoid the risks and costs of malpractice suits. However, Texas has a law that caps the awards for pain and suffering in malpractice at \$250,000. A physician in McAllen confirmed that the number of malpractice suits had dropped significantly since the law went into effect.

Gawande identifies three types of physicians. First, there are those who are “remarkably oblivious to the financial implications of their decisions...” Second, there are those who “think of the money as a means of improving what they do.” Then there are those “who see their practice primarily as a revenue stream. They instruct their secretary to have patients who call with follow-up questions schedule an appointment, because insurers don’t pay for phone calls, only office visits. ... They figure out ways to increase their high-margin work and decrease their low-margin work. This is a business, after all.” Gawande even learned of some physicians in McAllen who asked for six-figure payments from hospitals to admit patients.

Finally, Gawande focuses on the fee-for-service system of payment. He observes that as long as that system is in place, no amount of tinkering with the insurance system will be effective in lowering the

¹³ Rodin, Robert, *Free, Perfect, and Now*, New York: Simon & Schuster, 1999.

¹⁴ Gawande, Atul, “The Cost Conundrum,” *The New Yorker*, June 1, 2009.

cost of care. He gives some compelling examples of health care systems in communities that have managed to raise the quality of care while lowering its costs. One example is the Mayo Clinic, “which is among the highest-quality, lowest-cost healthcare systems in the country.” He reports that “decades ago Mayo recognized that the first thing it needed to do was eliminate the financial barriers. It pooled all the money the doctors and the hospital system received and began paying everyone a salary, so that the doctors’ goal in patient care couldn’t be increasing their income. Mayo promoted leaders who focused first on what was best for patients, and then on how to make this financially possible.” He goes on to say, “the core tenet of the Mayo Clinic is ‘The needs of the patient come first’ – not the convenience of the doctors, not their revenues. The doctors and nurses, and even the janitors, sat in meetings almost weekly, working on ideas to make the service and the care better, not to get more money out of patients.”

Could it be that physicians, insurers, drug companies, and patients are simply acting rational to the system? The players are incentivized to behave as they do. The system delivers what it is designed to deliver.

A particularly sad story came to me from a friend who was an executive in a large company. He told me about a conversation he had with a higher level executive. That executive had come from an equally high position in another company. My friend asked him why he had joined my friend’s company when he already had such a good job. The fellow responded that the CEO of my friend’s company, an old pal of his, had called him and said “this company is rolling in money – you should join us and get some of it.” The CEO later escaped with millions in parachute money and was later indicted for accounting fraud, but the company is bankrupt and apparently will cease to exist. The company’s investors, suppliers, retirees and employees will suffer. I wonder if the CEO is now sailing near Somalia, looking for his next engagement.

There may be cases in which incentives work only as intended, but I suspect they are relatively rare. The trouble is that we are usually dealing with complex systems (people and organizations) that may behave not at all like our myths would predict. The best policy may be to avoid incentives altogether and focus instead on creating systems in which intrinsic motivation, cooperation, ethical behavior, trust, creativity, and joy in work can flourish.

Biography

Gipsie Ranney is an international consultant to organizations on management, quality improvement and statistical methodology. She was a member of the faculty of the Department of Statistics at the University of Tennessee, Knoxville for fifteen years. She was a co-founder of the University of Tennessee's Institute for Productivity through Quality, and she developed and conducted numerous seminars on quality improvement. She served as Director of Statistical Methodology for General Motors Powertrain Group from 1988 to 1992. She co-authored *Beyond Total Quality Management: Toward the Emerging Paradigm*, published by McGraw-Hill, and contributed to *Competing Globally Through Customer Value*, published by Quorum. She has published papers on quality improvement and statistical methods. The American Society for Quality awarded her the Deming Medal for 1996, "for outstanding contribution in advancing the theory and practice of statistical thinking to the management of enterprises worldwide." Gipsie holds a B. S. in Mathematics from Duke University and a Ph.D. in Statistics from North Carolina State University.