

THE CANARY PRINCIPLE: AN ALTERNATIVE MODEL FOR PROVIDING REAL-TIME COACHING IN AN ON-LINE DISCUSSION ENVIRONMENT

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ABSTRACT

The purpose of this paper will be to elaborate on the canary principle, explaining its theoretical roots and proposed efficacy, setting forth principles through which it might be applied, and providing data from an on-line course in which the principle was used as the basis for an on-line discussion environment.

Keywords: canary principle, power, self-efficacy, motivation, expectancy-value model of motivation.

“Many years ago, I taught a course, in which I set the class up as a simulated company. I left a stack of syllabi in the front of the classroom, with a note on the chalk board stating that everyone was to read the syllabus and begin organizing themselves into a company, according to the guidelines provided, and begin working on a simulated new product launch. I then sat down in the classroom reading the syllabus as if I were one of the students.

As the students came in, they also began reading the syllabus. After a while one of them said, “Well, I guess we should get working on this.” We began discussing the course, project, and requirements. In the end, the students ended up electing me President of the simulated company. We were into the third class before they discovered I was the teacher.

The effect was enormously empowering. I could say and do things I never could have done as a teacher. I was able to suggest roles, activities, deadlines and so forth, getting candid feedback on what they would and would not do, what they hoped to get out of the class, and what they thought of my ideas. Any idea they suggested had to be sold on its merits. For their parts, the students quickly seemed to forget that they were being ‘taught,’ and took responsibility for what they were getting out of the experience.” – Anonymous

INTRODUCTION

One of the central problems of education is motivation. To learn, students must try out new ideas and behaviors, evaluate them, and incorporate those that promise to be effective. To facilitate learning, teachers structure a learning environment in which their students will be exposed to new ideas and behaviors. They then seek to motivate students to try out and evaluate them. Motivating students requires influence, or power. The question is how to exercise power in a way that will maximize learning?

The introductory vignette illustrates a unique approach -- an application of the canary principle. Canaries are birds whose origins and name stem from the Canary islands. Originally, the islands were named the Dog Islands after a breed of canines domesticated by local islanders. It is believed that the name Canary stems from the Latin derivation of canis, or dog (Olszewski, 1997). Over the centuries, several varieties of canaries have been bred to sing and can mimic other song birds of superior ability through exposure. This mimicking ability is sort of an avian version of the best practices technique (Taylor, 1919).

In the vignette, our young teacher played the role of the superior song bird, exposing her students to an accomplished role model, in an environment where they could observe and learn her approach, inviting them to mimic her activities. Specifically, she offered nothing to establish herself as the model to follow beyond external cues of competence and interpersonal techniques.

Casting this as a problem of power, or influence, what she did do was evoke what French and Raven (1959) call expert and referent power. Expert power is based on a belief that the person exercising the power has superior or valuable knowledge, skills or information. Referent power involves an attraction based upon interpersonal identification, liking, or respect.

The significance of the power base upon which our teacher drew is that the exercise of power has side effects, some of which are potentially toxic to education (Butler, 2002). French and Raven initially categorized power into

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five distinct social power bases: reward, coercive, legitimate, referent, and expert. Utilizing an pedagogical perspective, the exercise of reward, coercive, and legitimate (position, or status) power involve motives that are extrinsic to the learning process; that is (in the case of reward power), they encourage students to learn in order to receive a grade, praise, or some other unrelated benefit, instead of focusing on the usefulness of the education itself. Coercive power – the threat of failure, social ridicule, etc. – is similar, but with the added disadvantage of associating the educational process with negative emotions, such as fear. Legitimate power tells students to learn things or to engage in learning-related activities because it is their responsibility.

The sociological implications of power have been studied extensively. Besides French and Raven's (1959) decisive study, seminal works on power have also been written by Nietzsche (1878), Dahl, (1957), Emerson,(1962), Kornberg & Perry (1966), Nagel (1968), Wrong, (1968), Lukes, (1974), Foucault (1975), Toffler (1990), and Dowding, (1996). While the theories all differ, the implications are all similar. Power that is not drawn from a positive, intrinsic motivation on the part of the learner works against the efficient acquisition and internalization of knowledge.

The purpose of this paper will be to elaborate on the canary principle, explaining its theoretical roots and proposed efficacy, setting forth principles through which it might be applied, and providing data from an on-line course in which the principle was used as the basis for an on-line discussion environment.

MOTIVATION TO LEARN: THE THEORETICAL UNDERPINNINGS OF THE PRINCIPLE

In order to better understand the role of power, or influence, in the educational process, we draw on the work of Yakonich, Cannon, and Ternan (1997), who conceptualized student success in games using a performance model proposed by Lawler (1971). In their adaptation of the model, student performance can be seen as a product of three factors: student ability, problem-solving approach, and motivation. Professors generally have little control over ability. However, problem-solving approach is the core of what they teach. What complicates education is the fact that students' acquiring and using effective problem-solving approaches depends on motivation. Hence, the need for power.

Adapting Lawler's (1971) approach, Yakonich, Cannon and Ternan (1997) propose an expectancy-value model to address motivation in a gaming environment. Their model suggests that student motivation depends on three factors:

1. The subjective probability that a given effort will result in the desired performance;
2. The subjective probability that the performance will achieve a particular outcome;

3. The value placed on the outcome.

The model also accommodates a more holistic view of motivation by noting that students often receive intrinsic rewards from the putting forth an effort and seeing how it impacts on performance, which is to say, they might actually enjoy playing the game! Even more important, extrinsic motivation is potentially toxic to the educational process, as suggested by our earlier discussion of different modes of power. Expert and referent power draw on students' intrinsic desire to succeed, while reward, coercive, and legitimate power draw on motives that are not inherently related (that is, extrinsic) to the nature of the learning. This is not to say extrinsic motivation has no place in effective education. It can play an important role in motivating students to play the game (Hodgetts and Kreitner 1975). However, intrinsic motivation – the application of expert and referent power – tends to foster a richer learning experience (Butler, 2002).

ENTER THE SONG BIRD

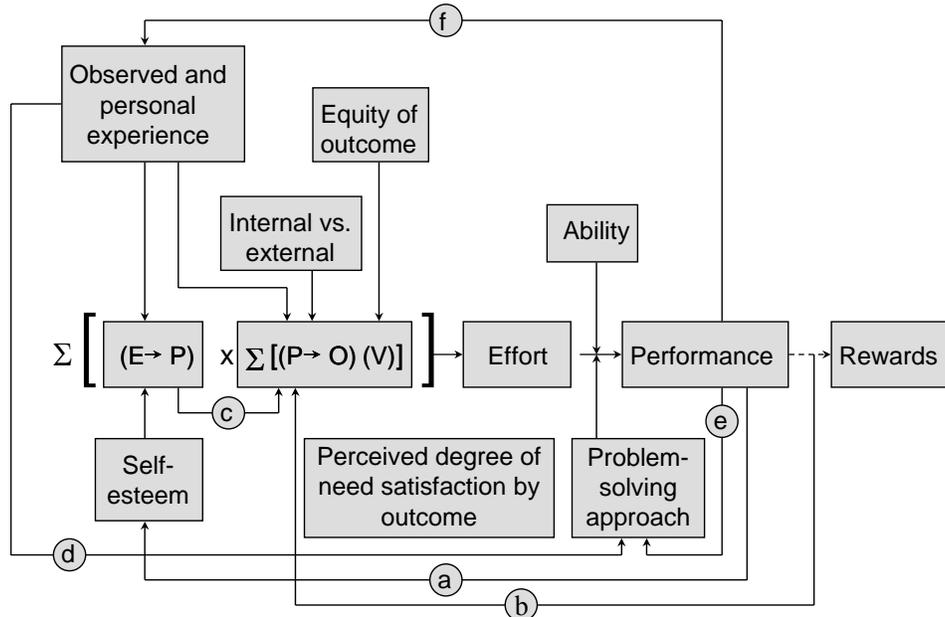
Our introductory vignette is an extreme example of the canary principle, where a teacher actually participated in the class as if she were a student. Is there another way to introduce instructor input without exercising reward, coercive, or legitimate, power? There is. Simply insert metaphoric song birds – teachers in disguise, or perhaps teaching assistants, as surrogates or skills – into the classroom as if they were students. In traditional terms, a skill pretends to be a fervent customer when in fact they are actually an associate of a person who is selling a particular item or service. Utilizing crowd psychology, the skill encourages other potential customers to purchase (Wikipedia, 2006). In the same sense, these skills could be incorporated into the classroom as students and through their actions, encourage the emulation of best practices.

This, of course, would be very expensive in a conventional classroom. Each bird would need to be a separate instructor. However, the implementation of skills would be a relatively simplistic task in an on-line classroom. On-line discussions may be conducted in real time through synchronous chat rooms or asynchronous threaded discussions. In either environment, an instructor may insert as many "song birds" as she pleases by simply creating fictional student personas and enrolling them in the class.

As a practical matter, the instructor might very well want to delegate the administration of the song birds to a teaching assistant. However, unlike a live classroom, a single assistant may administer a number of different birds. Furthermore, the instructor may easily step in and out of their roles herself as the occasion requires, either to handle difficult material or to orchestrate a particularly difficult learning sequence.

We will return to the development and administration of song birds in a later section of the paper. Let us proceed

Figure 1: A Comprehensive Model for Student Motivation and Performance Adapted from Lawler (1971) by Yakovich, Cannon and Ternan (1997)



with our discussion of the theoretical efficacy of the song-bird approach.

AN INTEGRATIVE MODEL FOR EVALUATING STUDENT MOTIVATION AND PERFORMANCE

Lawler's (1971) expectancy-value model of motivation, as proposed by Yakovich, Cannon and Ternan (1997) promises to be particularly useful for two reasons: First, it provides a comprehensive platform for integrating a number of different psychological theories that might apply to student motivation. Second, it seeks to elucidate key points of influence through which the instructor might manipulate student motivation and performance. Figure 1 illustrates the model.

We noted earlier that the model breaks motivation down into three components: the subjective probability that effort will result in performance ($E \rightarrow P$), the subjective probability that performance will result in a particular outcome ($P \rightarrow O$), and the desirability, or value, of the outcome (V). These provide key points of influence, though which the effects of the canary principle might be analyzed.

As we discuss these components, we will draw on selected comments from an actual on-line class discussion (Figure 2).

LINKING EFFORT TO PERFORMANCE

Figure 1 suggests that $E \rightarrow P$ is influenced by two potentially interacting factors, namely (1) the student's observed and personal experience and (2) the student's self-esteem. Considering observed experience, we note that the whole notion of class discussion is that students will learn from each other, and from their own experience as they test their ideas against those of the other students.

From a pedagogical perspective, the problem with this interaction is that students may not learn the right things. In fact, they may even reinforce each other's ignorance and biases (Feinstein, 2001; Feinstein, Mann, & Corsun, 2002). The role of the instructor is to pose questions or make other types of intellectual interventions to correct the problem (Klein, Noe, & Wang 2006; Korte, 2006). As we have noted, however, instructor interventions tend to be associated with extrinsic motivation – drawing on reward, coercive, and legitimate power, which focuses on extrinsic rather than intrinsic motivation. That is, students respond to rewards (e.g. grades) by treating them as the goal, which distracts them from true learning. Similarly, they respond to coercion (threat of failing) by trying to defend their position rather than discover truth. They respond to legitimate (position) power by treating the instructor as an authority figure rather than seeking to evaluate the merits of her thinking.

The net effect of instructor interventions, then, is often to focus students' efforts on performing for the professor rather than on learning for themselves. They do what they are told (or perhaps resist it), not experiment with different

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behaviors to find out where they will get the best return on their efforts. This was a danger with Comment D in Figure 2. Students might either withdraw (for fear of making a mistake), or they might try to give back a rote answer that seems to reflect the instructor's ideas.

According to the canary principle, the instructor could enroll song birds in the class to say the things she would like to say as an instructor. The comments might stand on their own (for students to evaluate), or the instructor may

comment on them. Either way, the regular students are free to evaluate what happens on its merits, thus forming an internally derived set of E→P estimates. The students can then model on the song-bird behaviors (as the canary does), learning the consequences from personal experience. The resulting performance provides further experience upon which they may draw (path "P" in Figure 1) to establish realistic estimates of E→P. Comment E illustrates a song-

Figure 2: Selected "Song-Bird" Comments from an Actual On-line Discussion

Comment A: A song-bird comment reinforcing an earlier statement regarding how students might make their discussion more impactful and seeking to establish norms regarding student feedback to each other.

Forum: Week 05 case discussion
Date: Fri Oct 13 2006 11:16
Author: Eriksson, Mac <emac@execs.com>
Subject: Making good comments

Times Read: 14

Remove

Hey, I don't know whether you guys caught it, but Hugh dropped a very interesting comment yesterday on last week's discussion board. We have talked about how to get rid of same-old, same-old comments that none of us have time to read. I haven't said much because I wasn't sure how to say something that wasn't same-old. He gave an example of how a comment could be a yawner and how to make the same comment fresh and value-added. I assume he was using the "search" feature (upper right on our discussion board) to find where topics have been discussed earlier. I've been playing with it, and it's not that easy to find things, but then, I'm not much good on Google either.

Was this a useful comment? Maybe we could help each other figure out what is useful and what isn't.

Reply

Comment B: A song-bird comment reinforcing the idea of providing feedback to fellow students.

Forum: Week 05 case discussion
Date: Fri Oct 13 2006 11:24
Author: Baker, Sarah <ax0095@wayne.edu>
Subject: Re: Making good comments

Times Read: 12

Remove

I thought it was a great comment, but I can tell you just what Dr. Cannon will say. "Good comment, but it was 142 words!" (I copied it into a word file and used tools/word-count).

Seriously, I'd love for us to help each other. I know business is brutal about demanding high-value communications. I've been forcing myself to try different kinds of comments, and I have really thought about what would give them value. I've learned a lot, but it's very scary! I don't mind being scared, but I could use feedback, so I know what is working.

Reply

Comment C: A student comment regarding "manipulative" advertising. (The student's name is disguised here to protect privacy)

Forum: Week 05 case discussion
Date: Fri Oct 13 2006 23:00
Author: Pappas, Justin <ak2593@wayne.edu>
Subject: Re: Advertising strategy and social issues-benefit perceptions

Times Read: 15

Remove

I believe a stronger understanding of the human condition gives people the opportunity to persuade people through legitimate benefits or manipulation. I can't tell you where the line is between the two, only that there is a line, and it's frequently crossed.

You'll never find satisfaction or contentment in life from "things" or from another person.

Reply

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Comment D: Instructor's comment, providing direction on what she is looking for in the discussion.

Forum: Week 05 case discussion

Times Read: 15

Date: Sat Oct 14 2006 05:41

Author: [instructor]

Subject: Re: Legitimate benefits versus manipulation

[Remove](#)

I agree that there is a line between legitimate benefits and manipulation. But it is not enough to say, "I will know it when I see it". I am deliberately pushing you to define that line. Once you have defined it, you can begin testing it in different cases until you have internalized the principles, know how to apply them in real life, and they have become, "unconscious competent". Even in areas where you are already "unconsciously competent, you will never know for sure until you have analyzed WHY and consciously tested the principles.

[Reply](#)

Comment E: A song-bird comment illustrating how a student might respond to the instructor's request.

Forum: Week 05 case discussion

Times Read: 15

Date: Sat Oct 14 2006 09:42

Author: Baker, Sarah

Subject: Re: Legitimate benefits versus manipulation

[Remove](#)

But the question we are asking is how to define that line? I assume from your lecture that it involves your four economic principles. If so, then Justin's "manipulation" would be whenever advertising

1. focuses people's attention on something that is against their self-interest (like how cool it is to smoke, causing them to forget that each cigarette takes 11 minutes off their life expectancy!)
2. does something to limit the number of alternative products available.
3. gives consumers bad information.
4. (Do externalities manipulate people?)

[Reply](#)

Comment F: A song-bird comment reinforcing the value of the previous comment

Forum: Week 05 case discussion

Times Read: 15

Date: Sat Oct 14 2006 10:17

Author: Eriksson, Mac

Subject: Re: Legitimate benefits versus manipulation

[Remove](#)

Sarah, you wanted feedback. Your comment really helped! I guess I hadn't put it all together. xxxxx's saying that getting people excited about buying a computer for school is OK, because it will make them happier in the long run. As Justin says, this is a legitimate benefit. Getting people to smoke is manipulative, because if they really thought about the consequences, they wouldn't do it.

[Reply](#)

Comment G: A song-bird comment giving a friendly voice to potential student concerns about student "brown-nosing"

Forum: Week 05 case discussion

Times Read: 9

Date: Sat Oct 14 2006 17:17

Author: Noble, Owen

Subject: Re: Legitimate benefits versus manipulation

[Remove](#)

You've got my vote! But (here's your feedback), I find it irritating that you seem to have all the answers!

[Reply](#)

Comment H: A song-bird comment designed to “legitimize” instructor-responsive comments as a legitimate learning activity.

Forum: Week 05 case discussion

Times Read: 13

Date: Sat Oct 14 2006 17:23

Author: Baker, Sarah

Subject: Re: Legitimate benefits versus manipulation

Remove

You can't see me, but I'm sticking my tongue out at you! :)

Reply

bird comment designed to play this role. It is a thoughtful response, showing students how they might apply the principles discussed in class.

Our metaphoric song birds have the added advantage of being seen as peers by the regular students. An instructor might develop good rapport with students and establish a base for referent and expert power. However, attribution theory (Heider, 1958; Jones & Davis, 1965; Kelley, 1967) would suggest that the instructor's expertise comes from superior intelligence and/or training, neither of which is accessible to the student. This would undermine the modeling process, because students would not think they are (or could be expected to be) performing in the same way as the instructor. By contrast, if a peer does something, the other students are more likely to say, “Hey, I could do that too!” Comments A and B show song-birds discussing their insecurity and rationale for making comments, thus making it easier for students to identify with them.

The second major factor suggested to influence E→P in Figure 1 is self-esteem. As Yakovich, Cannon, and Ternan point out, self-esteem is a generalized feeling of adequacy and competence, relating to what Bandura (1982) calls self-efficacy. Students with high self-efficacy are likely to trust themselves, even in the face of instructor interventions. In terms of transactional analysis theory (Berne, 1964), they would tend to interact with the instructor in adult-adult rather than parent-child transactions. In Comment E, Sarah Baker models this behavior, asserting the students' agenda rather than that of the professor. She says, “But what we are asking is ...”, followed by an analysis of what the instructor seems to be saying.

Presumably, if students truly identify with the song-bird, modeling adult-adult transactions will help build self-esteem. If song-bird comments receive positive reinforcement, this identification should also cause the reinforcement to produce an esteem-building effect as well. For instance, Comment F was designed to reinforce Sarah Baker's Comment E. If other students identified with her, they would be feeling good about the results of her effort.

Of course, Comment F could have been made in response to a canary's (a regular student's) comment as well. If an instructor praises students' performance, this can backfire, by making a student stand out, potentially creating jealousy or embarrassment. Furthermore, attribution theory raises the possibility that students will discount praise from

the instructor, seeing it as an attempt at manipulation. By contrast, song birds can praise our canaries without such attributions.

An instructor can also structure interactions between herself and the song-birds to head off attributions of manipulation. For instance, an instructor might say, “This is the kind of comment I like to see.” The song bird might reply, “That's the kind of comment I like to hear! But I'm wondering if you could explain what you liked about it.” This is what happened with Comments D and E. It places the song bird (with whom the students identify) in the active, or adult-adult, role in the interaction. The active person is not usually perceived as the one being manipulated. This can create an environment in which students are more open to esteem-building feedback from the instructor.

Finally, song birds can also be used to build self-esteem indirectly. Figure 1 (path “a”) indicates that actual performance influences self-esteem. Suppose other students were to begin making more incisive, analytical comments, along the lines illustrated by Sarah Baker in Comment E. This would increase the quality of their performance, winning them feedback, thus building their self-esteem. The effect would be to E→P still further, and ultimately, self-esteem, continually building on itself in a positive cycle.

LINKING PERFORMANCE TO OUTCOMES

Students' beliefs that their effort will result in performance has little value if their performance brings no rewards. The P→O assessment, or what expectancy-value theorists call instrumentality, determines how likely the rewards (outcomes) are to be perceived to follow performance.

Figure 1 suggests three inputs into P→O. The first and third are essentially the same. Path “f” and the arrow connecting the “Observed and personal experience” box with P→O say that students will observe from the discussion itself whether good comments are rewarded. Path “b” says the same thing, except that it does not allow for the more abstract process of learning from the experience of others.

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Following the logic of our earlier discussion, song birds can be very effective in providing credible experience for students to observe. That is, the instructor can send powerful signals to students by entering song-bird comments, and then reinforcing them herself or having other song birds provide the reinforcement. This was illustrated by the sequence of Comments C through F.

Second, P→O is influenced by one's beliefs regarding internal control versus external locus of control (Rotter, 1966). Some people (in our case, students) have a generalized tendency to believe that their behavior has little impact on what happens to them in life (external locus of control), thus reducing P→O. Others tend to believe their behavior makes a difference (internal locus of control), thus yield higher estimates of P→O (Lefcourt, 1966).

People generally develop their sense of locus of control over a lifetime of experience. Therefore, the construct is generally considered to be a personality trait, carrying over from situation to situation. To the extent that this is the case, an instructor cannot do much with it. However, there is some evidence that it may change in some situations (Phares, 1976). If this is the case, song-birds might be used to create examples where performance does matter. For instance, later in the discussion stream from which Figure 1 was extracted, the instructor provided feedback, indicating that Sarah Baker's comments were very much on target, and merited student attention.

Earlier, we noted that extrinsic rewards may not have a positive effect on the learning process. By implication, we might conclude that intrinsic rewards would have a more positive effect (Deci, 1975; Deci & Ryan, 1985; Deci & Ryan 1991). In this context, the intrinsic/extrinsic distinction has two meanings: First, as suggested by path "c" in the figure, effort might provide its own reward. For instance, the effort of trying to analyze a case and formulate good discussion comments is intrinsically rewarding for many students.

The second form of intrinsic relationship refers to whether the outcomes resulting from performance are inherently related to the problem being discussed. For instance, the process of identifying key concepts in a case discussion (a performance) is related to the student's case-solving ability (an outcome). According to the second definition, the outcome would be considered intrinsically rewarding. By contrast, receiving points from the instructor (an outcome) for having made one of three required comments (a performance) is not. Even if the instructor is rewarding highly insightful comments, if the student is making the comments to please the instructor rather than to learn how to effectively solve business problems, the reward is extrinsic.

Again, any evaluative communication from the instructor carries the weight of authority (legitimate power), the threat of a low grade (coercive power), or the reward of receiving a positive evaluation from the instructor (reward power). This focuses on what the instructor wants rather than the concept the instructor wants the students to learn.

When fellow students (our song birds) provide feedback to other students, this problem goes away. Their observations address the intrinsic merits of the students' comments.

THE VALUE OF OUTCOMES

The value of the outcome is influenced by the degree to which the outcome is valued by the student. As Figure 1 suggests, this is largely determined by the degree to which it is perceived to satisfy the student's needs. Any number of theories are available to help us identify these needs. Yakonich, Cannon and Ternan (1997) suggest that Maslow's hierarchy of needs (Maslow, 1943; Maslow & Lowery, 1998) might be particularly useful.

Applying Maslow's theory, when students' lower-level needs are filled (physiological, safety, belonging), their motivation tends to be driven by higher-level needs (esteem and self-actualization). Returning to the concepts of power, reward, coercive, and legitimate tend to address lower-level (extrinsic) needs. These can be powerful, because our lives are serviced by a complex set of interrelated needs, the natures of which fall at every level of the hierarchy. Typically, a student is enrolled in a business program with the (extrinsic) hope of better employment. A threat of failure puts the whole program in jeopardy, thus appealing to even lower-level needs. Success promises the progressively more intrinsic motivation of a good life (belonging), prestige (esteem), and the opportunity to make truly significant and personally fulfilling contributions to the world (self-actualization).

The key point is that all of these motivations are part of a larger system, where any one of them may be activated if it is aroused, or otherwise appears to require attention. Part of the instructor's task is to arouse those needs that offer the greatest potential for effective learning. Our thesis is that the quality of student effort is better when the driving motives are related to high-level, more intrinsically motivating, needs. Again, we suggest that the task of arousing these needs might be served by song birds, who have no power to evoke lower-level motives. Ideally, they would stimulate high-level motives, such as problem-oriented curiosity (Loewenstein, 1994; Gentry et. al. 2001, 2002).

According to Figure 1, the second factor impacting on the value of outcomes is their fairness, or equity (Adams, 1963, 1965). Equity theory suggests that either over- or under-payment will create an imbalance that people find uncomfortable and try to rectify. For students, an underpayment tends to come in the form of grades or recognition that they feel is not consistent with the quality of their work. Sometimes, this is actually the case, due to poor evaluation skills or a poor grading scheme on the part of the instructor. Other times, the problem is that students don't have a realistic sense of what high performance really is. Having addressed the pitfalls of delivering this message through the instructor, we may theorize that a meaningful song-bird dialog might help students adjust their expectations. For instance, a song-bird might say, "I work

with some very bright people. I'm all for fairness in grading, but they are tough competition. The professor is not doing us a favor by rewarding shallow thinking and sloppy logic."

This same comment addresses the problem of over-payment. Over-payment generally comes in the form of low intellectual and work standards, accompanied by grade inflation. The rewards are extrinsically satisfying, at least in the short run. However, accepting them undermines self-esteem and undermines their intrinsic value.

Returning to the concept of intrinsic motivation, Yakonich, Cannon and Ternan (1997) note that the mathematical formulation of expectancy-value theory might not hold. The mathematics posit that the subjective probabilities of $E \rightarrow P$ and $P \rightarrow O$ should be multiplied, so that the larger the probabilities, the larger the motivation. They note, however, that this is not necessarily the case. Using Loewenstein's (1994) curiosity gap theory as an example, students are motivated by gaps in their understanding. If these are too easily filled, the information gap closes and the motivation to follow through may decrease. Only by maintaining an "information gap," will the learning environment evoke enough curiosity to motivate students. Mathematically, we are saying that these intrinsic rewards (a sense of accomplishment and growth in one's decision making ability) are greatest when the subjective probability, $E \rightarrow P$, is less than 1.0. Again, this is represented by path "c".

Yakonich, Cannon and Ternan (1997) raise an interesting possibility. They argue that the entire motivational system depends on the way in which students frame the educational experience. That is, it depends on what goals they see themselves as pursuing. We alluded to this in our discussion of Maslow's hierarchy of needs theory. If a person's life consists of a complex system, involving a host of potential needs, potentially occupying every level of the hierarchy, the value a student assigns to any particular outcome could vary dramatically from one educational system to another. Students who frame the course as a means to graduate and get a job will likely prefer outcomes that lead to this end, and ones for which the associated values of $E \rightarrow P$ and $P \rightarrow O$ are as high as possible. If they frame it as a process through which they are developing skills that will give them success and satisfaction in business, they will likely be more intrinsically motivated, looking for challenges that will make their education a growth experience. These students would tend to value outcomes where $E \rightarrow P$ is lower, but obtainable through quality effort.

Here, our song birds can again be useful. The salience of various goals – the way students frame their educational experience – can be strongly influenced by peer interactions. If students see peers tackling interesting problems with gusto, they are naturally drawn into an achievement-oriented frame of mind (McClelland, 1961; Atkinson, 1964).

WHERE DO WE GO FROM HERE?

This paper represents a preliminary formulation of the canary principle as applied to an online discussion in a college course. It suggests an educational approach that appears to have considerable merit. However, a number of issues have yet to be addressed.

THE QUESTION OF VALIDITY

First, and foremost, is the question of validity. Does it really work? The answer, of course, is that we will never know for sure, because there are too many variables whose theoretical efficacy depends on how they are operationalized. However, the issues can be addressed over time through experimentation, with careful manipulation checks to ensure that the treatments are doing what they are proposed to do. For instance, does Comment D in Figure 1 really create student identification with our Sarah Baker song bird? And if it does, do students $E \rightarrow P$ really go up? If so, does this increase motivation? Do our students really act according to the canary principle?

Our purpose here is not to design a rigorous program of research, but to identify some of the issues that need to be addressed. No single study will be able to address them, but over time, a number of studies might make very useful contributions to our understanding.

OPERATIONALIZING THE MODEL

Operationalizing the canary/song-bird model raises a number of important issues. First is the question of how to create the desired effects – student identification, the proper level and type of comments (so that canary emulation is possible), effective reinforcement, and so forth. Our research program should create manipulation checks to test these. But it should also identify the principles that make for effective implementation.

Second, we need principles for creating a balanced set of song birds – students with distinct and credible personalities, who are well suited to the task. In terms of our earlier discussion of power, they should yield influence based on expertise and/or attractiveness.

THE QUESTION OF ETHICS: THE APPEARANCE OF EVIL?

One of the most obvious questions raised by the song-bird/canary model is one of propriety. Is it ethical to deceive students by obscuring your identity as a teacher, even if it helps in the educational process? Certainly, this is a topic for future discussion.

Furthermore, in an era of blogs, where many companies have received bad press by making self-interested comments under the pretense of being customers, the dangers of student backlash may out-weight the advantages.

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