Motivation

Blithering Genius

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Contents

This is a brief sketch of a theory of motivation.

Motivation drives action. It also causes the experiences of pleasure and pain. We experience pain when motivation increases, and pleasure when motivation decreases.

1 Emotions

Motivation is generated by emotions, such as hunger, thirst and lust. Emotions generate motivation, and motivation generates action. Each emotion has a biological function. Hunger motivates eating. Thirst motivates drinking water. Lust motivates sex.

Some emotions react to stimuli. For example, if you are pricked with a pin, then you will experience pain. The pin activates sensory receptors in the skin (nociceptors), which send a signal to the brain, where it generates an emotional reaction. That reaction will motivate you to act in a way that avoids the noxious stimulus.

Behavior can be divided into two broad categories: avoidance and pursuit. Some emotions generate avoidance behaviors. Fear is a generic emotion that motivates avoidance. Other emotions, such as hunger, generate pursuit behaviors, such as seeking food. Emotions that motivate pursuit tend to build up over time, while emotions that motivate avoidance tend to be immediate reactions to stimuli. However, because we have complex, goal-directed behavior, we can act in advance to prevent future danger and harm, rather than just reacting to it.

Emotions are heuristic problem recognizers. They recognize biological problems, and generate the motivation to solve them.

2 Problems And Solutions

Why do emotions generate motivation instead of action? Why is there an intermediate step? In some cases, a stimulus directly generates action, such as shivering when you are cold, or jerking your hand away from a hot stove. However, that stimulus-response mechanism can only generate simple behaviors.

Complex problem-solving requires a separation between the problem and the solution. The same problem can occur in different contexts, and the best solution can depend on the situation. Multiple problems can occur simultaneously, and the best solution can involve trade-offs.

Both cognition and learning depend on the problem | solution distinction. Making a sandwich is a very complex solution to the problem of hunger, and it could not be instinctive. Emotions allow the problem of hunger to be separated from the behavior that solves the problem. The behavior can then be learned from experience or generated by thought.

The brain is a machine for generating behavior. Behavior consists mainly of muscular activation, but it can also involve glandular secretions, such as salivation. Consider an apparently simple problem of action, such as walking across a room and opening a door. To do that, your brain must generate millions of coordinated muscle twitches that depend on input from your senses.

Action is a way of solving problems. To generate action, the brain first defines a problem, and then generates the action to solve it. To walk across a room and open a door, you must want to open the door, presumably because you are going somewhere. Before the brain generates the action to open the door, it identifies the problem of opening the door. The problem is both defined and solved by the brain. Emotions are central to that process. They generate the want.

3 Types of Problems

We can divide problems into the following general categories:

- Harm to the body (being poked with a pin, bitten by a crocodile, etc.).
- Resource needs (the need for food, water and air).
- Getting shelter and comfort.
- Avoiding threats and dangers.
- Increasing one's agency (acquiring money, knowledge, property, etc.).
- Social desires (having beneficial relationships).

- Sexual desires (having sex, creating and maintaining sexual relationships).
- Taking care of one's children.

Solving these problems is instrumental to reproduction, which is the biological purpose of life. But we have no reproduction drive, nor do people naturally view reproduction as a problem. Instead, human beings reproduce by solving many smaller problems. We have different emotions that motivate us to solve different problems.

For example, hunger motivates you to eat. It makes getting food a problem. Hunger causes you to want food. Then your brain generates a plan to get food, such as the idea of making yourself a sandwich. That idea is an intention. The intention then generates action. You get up, walk across the room, open the door, go to the kitchen, and make yourself a sandwich. The motivation is necessary to generate both the intention and the action.

4 Emotions And Evolution

Why don't we just have a "reproduction drive"? Because such a thing could not evolve. Evolution builds complexity incrementally, by trial and error. It does not consciously design organisms to reproduce. Reproduction is an abstract concept. It cannot be recognized based on a stimulus. Even if an organism had a drive to reproduce, it would be impossible for the organism to figure out which action would be instrumental to reproduction in a specific context.

We do not begin life with an abstract core value (the purpose of life), and then derive lesser values from that core value. Instead, we are born with a number of different emotions. Values emerge from experience over time, as we learn what satisfies our emotions.

Emotions evolved from simple stimulus-response circuits, but they have evolved into something much more complex in humans and other higher animals. Some of our emotions are directly linked to internal or external stimuli. Hunger, thirst, and physical pain are examples. Social and sexual emotions depend on stimuli in more complex ways. We also have emotions that drive generic proactive behavior, such as fear and hope. Fear can be directly generated by a stimulus, such as seeing a spider, but it is usually generated from ideas, which might not be tied to any current stimulus. For example, you can be afraid of death in the abstract, even if there is no immediate threat to your life. We are also driven to seek knowledge by curiosity/boredom. There is a certain amount of background motivation that "looks" for something to do.

Evolution cobbled together this mechanism, which consists of many different emotions that work in the same way: by generating motivation. Instead of proactively pursuing the abstract goal of reproduction, we are driven to pursue many different, smaller goals that are instrumental to reproduction (or were in the ancestral environment).

Even though we are capable of goal-directed behavior, our emotions are reactive. They react to stimuli or mental states or both. Evolution discovered a way to generate proactive behavior from internal reactions.

5 Motivation And "Currency"

Motivation is the "currency" of action. At any moment, your motivation determines both the direction and intensity of your actions. It also directs thought, because thought is part of the problem-solving

process. We can think of motivation as having units of Watts (joules per second), because it determines the rate at which your body does work. However, that is only a metaphor. Human action is highly complex, and it can't be reduced descriptively to physical work.

It is important that different emotions generate the same currency. This has several advantages:

- It allows the organism to resolve trade-offs between different problems.
- It can motivate actions that are instrumental to solving multiple problems.
- It supports a generic good | bad distinction, which makes value-knowledge and value-judgments possible.
- It makes proactive behavior possible.

Proactive behavior is driven by background motivation that is not a reaction to a stimulus.

For example, hunger motivates a lion to chase a gazelle, in the hope of getting a meal. However, the chase also generates fatigue, which motivates the lion to stop running. The lion might also be afraid of getting hurt in the chase. Or the lion might be thirsty, and go to the waterhole instead. The lion's actions depend on the relative strengths of different motivations.

6 Motivation And Values

Emotions do not directly generate value judgments, but the currency of motivation defines a generic good | bad distinction. Something is good if it decreases motivation, and bad if it increases motivation. Value is a dimension of knowledge and judgment. We can learn from experience what is good or bad for us.

Value is not necessarily tied to any specific emotion. It can be. For example, I have the knowledge that hamburgers are good to eat. But it could also be generic. A good knife can be used to solve many different problems. Money is another example of a generic good. I have learned to value money, not because it solves a specific problem, such as hunger, but because it can solve many problems.

Proactive behavior can be generated from value-knowledge. Once I have the knowledge that money is good for me, I can be motivated to acquire money, even if I don't know how I will spend it. The brain generates proactive behavior by attaching background motivation to an idea of something valuable. I can be motivated to fix the roof, store food, or save money for the future.

7 Pain And Pleasure

We do not directly experience motivation itself. Instead, we experience changes in motivation as pain and pleasure. Pain is an increase in motivation, and pleasure is a decrease.

People often think of pain and pleasure as being caused by external objects and events. For example, they think of the pleasure of eating a hamburger as caused by the hamburger. They don't think about hunger as a cause of the pleasure, although it obviously is. You must be hungry to feel pleasure from eating a hamburger. The greater the hunger, the greater the pleasure. The pleasure comes from the reduction of prior motivation.

Pleasure and pain are an important aspect of subjective experience. They are experiential opposites. Together, they constitute the hedonic dimension of experience. As motivation varies over time, we experience pain and pleasure. Those experiences are linked to the events that increase or decrease motivation, such as being poked by a pin, or eating a hamburger.

It is important to distinguish between motivation and pain. Motivation causes both pain and pleasure. Consider hunger, for example. Hunger is the motivation to eat. An increase in hunger is experienced as pain. A decrease in hunger is experienced as pleasure. The pleasure of eating is the decrease in one's motivation to eat. Without prior hunger, there is no pleasure in eating. While you are eating, you are still hungry (motivated to eat), but you experience pleasure as the hunger decreases. This shows the difference between motivation and pain. The fact that you are eating demonstrates that you are still hungry (motivated to eat), but you do not experience pain from that motivation. Instead, you experience pleasure as the motivation is reduced.

Walking provides another demonstration of the difference between motivation and pain. To walk, you must be motivated to walk, otherwise you would stop walking. Do you constantly experience pain while you walk? No. If someone gets in your way and slows you down, however, you will feel irritated. If you suddenly remember that you are late for an appointment, then you might feel anxious and start walking faster. Those events cause pain because they increase your state of motivation. If you are just walking down the street, then you won't experience pain, even though you are clearly motivated to walk. This shows that action is driven by motivation, not pain.

Pain and pleasure are transient experiences. They exist only in the moment. You can remember that you experienced pain or pleasure in the past, but you can't re-experience those feelings. They aren't stored in your brain. Only memories about the experiences are stored.

Pain and pleasure define the success or failure of action. An action that causes pleasure is a success. An action that causes pain is a failure. A successful action reduces motivation. To do so, it must solve one or more problems without creating bigger problems.

Pain and pleasure are the inductive basis of values. We learn what is good or bad for us from the effects of actions and events on motivation. We learn to recognize the causes of problems and how to solve them. For example, you could learn that going out in the rain without a jacket will make you cold, thereby creating the motivation to warm up. If you recognize being cold as a problem, then you can act to prevent that problem from occurring. You could wear a jacket, for example, or stay inside on a rainy day. That action is not a reaction to a stimulus. It is proactive and based on value-knowledge.

8 Knowledge And Judgments

Conceptual knowledge has three aspects: truth, value and action, which are induced from sensory, emotional and motor data respectively. Value-knowledge is the value aspect of conceptual knowledge. For example, my concept of a hamburger contains truth-knowledge (how to recognize a hamburger), value-knowledge (hamburgers satisfy hunger) and action-knowledge (how to hold a hamburger). Value-knowledge is used to make value-judgments and choices of action. If I am hungry, eating a hamburger will come to mind, especially if I am walking past a McDonalds.

Value-knowledge is not based on the total effect of action on pain and pleasure. For example, going out in the cold causes pain. It creates the motivation to warm up. However, it is also a necessary cause of the pleasure of warming up. You can't experience the pleasure of warming up

unless you are cold. So, going out in the cold causes both pain and pleasure. It directly causes the pain of being cold, and it indirectly causes the pleasure of warming up. But the way the brain induces value-knowledge only associates the pain with the action of going out into the cold. It associates the pleasure with the action of warming up. That is the biologically correct evaluation. To act effectively toward reproduction, you should avoid hypothermia, and if you are hypothermic, you should warm up.

Values do not reflect net pain and pleasure, or in other words, net hedonic utility. Action is not based on maximizing hedonic utility in the long run. It is based on reducing motivation in the short run. Proactive behavior is generated by creating the immediate motivation to do it. Value-knowledge is used to generate value-judgments (ideas of what is good or bad), and value-judgments create motivation.

For example, the value-judgment "being cold is bad" will generate the immediate motivation to put on a jacket before going outside. Then you will act to reduce that motivation by putting on a jacket. You will experience a very small amount of pain when the motivation to put on the jacket is created, and a very small amount of pleasure when the motivation to put on the jacket is satisfied.

Think about all the little things that you do in a typical day. Each of those actions had to be motivated. Some little bit of motivation was assigned to it, and then satisfied by doing it.

9 Homunculus Fallacies

Thinking of motivation as "pursuing pleasure and avoiding pain" is a homunculus fallacy. There is an element of truth to this metaphor, but it is also misleading. Pursuit and avoidance are behaviors, and thus they require motivation. When a lion pursues a gazelle, the lion is motivated to catch the gazelle, because the lion values that outcome positively. The gazelle avoids the lion, because the gazelle is motivated to escape, and negatively values being caught. Pursuit and avoidance depend on motivation and value-judgments. Thus, they cannot explain motivation or value-judgments.

Likewise, it is a fallacy to consider pain a punishment and pleasure a reward. What makes something a punishment is that it causes pain. What makes something a reward is that it causes pleasure. Pain does not cause pain. Pleasure does not cause pleasure.

Homunculus fallacies are a common pitfall in reasoning about the mind/brain. The homunculus fallacy is a type of conceptual question-begging. It explains some aspect of consciousness in terms that presuppose a deeper level of consciousness: agency inside the agent.

Pleasure and pain are the experiences of changing motivation, not something that we are motivated to pursue or avoid. Value-knowledge is induced from pleasure and pain, in association with sensory and motor data. Value-knowledge is then used to generate value-judgments and intentions, which motivate complex behavior.

10 Definitions

These are the concepts I have introduced so far, and their relationships:

- Motivation: The impulse to act, generated by emotions.
- Emotions: Specific motivation generators that evolved to motivate different behaviors.

- Pain and pleasure: The subjective experience of changing motivation. Pain is an increase in motivation. Pleasure is a decrease in motivation.
- Value-knowledge: An aspect of conceptual knowledge. It is induced from pain and pleasure, and their correlations with other aspects of embodied experience.
- Value-judgment: A conscious idea of what is good or bad for oneself.
- Intention: A conscious plan of action.

In addition to the motivation created by internal and external stimuli, the brain generates a background level of motivation automatically. This motivation is not tied to any stimulus. It motivates proactive behaviors. We call it "curiosity", "boredom", "anxiety" or "restlessness". It is the urge to do. It motivates us to think and act, even when there is no immediate problem to solve. Sometimes, it motivates simple exploration behavior, such as going for a walk, or play behavior, such as playing video games. Sometimes, it motivates us to work on long-term projects, such as fixing the roof, doing the taxes, or writing a book. The attention system automatically generates problems for us to work on, based on value-knowledge. If it can't find something to do, then we think about what to do, or we go looking for something to do.

11 Conclusion

The theory implies that pleasure and pain balance out in the long run.

Mathematically, we can model pain and pleasure (the hedonic dimension) as the first derivative of motivation as a function of time. Let's use M to denote motivation and P to denote the first derivative of M. When M increases, P is positive, which corresponds to pain. When M decreases, P is negative, which corresponds to pleasure. If we assume that your life begins and ends with M = 0, then the integral of P over your lifetime is zero. In other words, pain and pleasure balance out.

It could be argued that, at the end of your life, you can experience pain that is not balanced by pleasure. For example, suppose that someone shoots you in the leg, causing extreme pain, and then shoots you in the head, ending your consciousness (like that scene in "Pulp Fiction"). If we don't count the moment of death as pleasure, then you have experienced net pain. However, in that case, your net hedonic utility only depends on the circumstances of your death. It depends very little on how you lived your life. And by the time it could (theoretically) be added up, you would no longer exist.

Control mechanisms tend to be zero-sum. Consider the steering wheel of a car, for example. It can turn to the left or to the right. Over the lifetime of the car, the total amount of left and right turns will cancel out. Likewise, the up and down motions of the gas and brake pedals will cancel out. Each goes up and down, up and down, over time. The car goes somewhere in reality, but the control mechanisms do not go anywhere inside the car. We should expect the control mechanism of a human being to be zero-sum, because it has the same type of function relative to the whole. There is nowhere to go inside your brain.

The theory implies that the pursuit of happiness is futile.

Satisfaction is not a long-term condition. It is transient. If you satisfy one desire, another one is created. Motivation is always being generated by the brain. This is biologically adaptive. There is always something that you could do to improve your reproductive fitness, such as looking for a

mate, acquiring power, improving your defenses, acquiring knowledge, etc. So, even if you have comfort, shelter, food, power, mates, etc, you will not be satisfied. You will want more.

The theory explains the hedonic treadmill: the observation that people habituate to their circumstances, and only experience pleasure from improvements. It explains why people living in very different circumstances display the same range of emotional experiences. Rich people are not happier than poor people. Young people are not happier than old people. Beautiful people are not happier than ugly people. Everyone would like to be rich, young and beautiful, but it would not make them happy.

Again, this makes sense biologically. The human form did not evolve to be happy. It evolved to act toward the purpose of reproduction. We are reproducing machines, not happiness machines. The brain is a behavior generator, not a happiness generator.