

# MACCS-Assign 1

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## Question 1 Deviant Aggressive Behavior

### Theory 1: Harsher Punishments

Theory 1 suggests that the punishing deviant aggressive behaviors may reduce its occurrence because people can learn from their past experiences. Therefore, if theory 1 is correct, policy-makers should consider increasing the strength of the punishments to outweigh the possible 'rewards' gained from performing deviant aggressive behaviors, which means harsher laws. For example, if a society wishes to reduce the robbery, its policymakers can consider increasing the length of imprisonment, demanding a more considerable amount of fine and even bringing in physical punishments like canning. After suffering from the above harsher penalties, law-violators would less likely to perform the aggressive behaviors again due to the lesson learned from the experience, if theory 1 is correct.

### Theory 2: Limit the personal authority

If theory 2 is correct, then the key to the problem is to limit personal authority. At the national level, there should exist an official institution that supervises the national leader (king, queen, the president, or the chairmen). Also, it's nice to limit the serving term of a national leader, emphasizing that the power of a national leader comes from position, instead of himself or herself. At the society level, there should also exist some formal regulations and laws that prohibit abusive behaviors from senior managers to staffs with lower positions. Similarly, students at school should be endowed with the right to question their teachers, and kids, even under-age, should have the right to sue their parents if being mistreated by the personal authority.

An alternative way, which is milder, is to carry national-wide propaganda that educates every citizen to distinguish personal authority from positional authority and teach them how to use the power properly. For example, managers in companies still maintain their rights to direct the company and making requests towards the staff (positional authority) . But they will learn that they should carry out such directions with respects and concerns at any moment . Similarly, teachers at the school still keep their rights like assigning grades and giving comments, but they will learn to do so impartially without carrying any personal biases.

### **Theory 3: Take care of the disadvantaged group**

If theory 3 is correct, the key is improving social equality and mend the rules with social policies that compensate individuals hurt from the systematical discrimination from the social rules. Therefore, policy-makers should pay particular attention to the minorities and the disadvantaged social groups and promote their welfares. Specification actions include (but not limited to) funding students from disadvantageous social-economic backgrounds to higher degrees, offering free medical services to unwed mothers and building infrastructures like roads and the internet for rural areas whose residents are suffering from lack of opportunities to develop the economy. After carrying out policies like above, the society would have less oppressed individuals, and consequently, less deviant aggressive behaviors.

### **Theory 4 : Carnivals and Festivals**

Since segregation would never be a good solution to the problem, the only way left is to subvert subcultures with some deviant characteristics gradually (I think this is a better term than deviant sub-cultures) and integrate them into the mainstream. Then, the first step is seeking similarities and creating a shared identity. Holding festivals and carnivals is one of the solutions.

Let me take the counter-school culture from Paul Willis' 'Working to labor' to illustrate my idea. The kids from the working-class create the counter-school culture, and it's apparent from the name that such culture carries some deviant characteristics. The process of adolescence is a journey of seeking identity and belongings. Thus, after knowing the counter-school culture, working-class kids with resonating backgrounds are more likely to join the culture and self-identify through acting aggressively against schools and confronting other social norms. I believe that holding a school carnival would be a practical solution. While celebrating a joyful event with other members of the school, kids from the counter-school culture may realize that they are parts of the grand moment, and they can be accepted by the school (or the mainstream culture). After they re-identify themselves by the event, the counter-school culture where they gained a sense of belongings is no longer needed.

Similarly, the Chicago government can consider holding a Chicago-food festival, welcoming all members of the city, to celebrate deep-dish pizza and other popular cuisines. Such festival can union all people from Chicago together, no matter what race, gender, educational backgrounds, occupations, and social statuses but only emphasize a shared-identity: the resident of Chicago. With a more secure sense of belongings to the mainstream, members of subcultures with deviant characteristics would probably diminish their devotions to it and therefore, reduce the occurrences of deviant aggressive behaviors.

### **Question 2: Waiting until the last minute**

- (a) Here are two explanations that might offer the theoretical support for the above observation. Both are based on the theory of hedonism and the assumptions of deadlines.

The theory of hedonism: Only pleasure or pain motivates us, which means what we tend to do is the result of pleasure-seeking and pain-avoiding.

Assumptions of deadlines:

1. The closer a deadline is, the more anxiety people feel.
2. (Since the anxiety motivates people to perform the task efficiently), deadlines are the most productive forces!!!!

Deadlines shi di yi sheng chan li!!!!

Explanation 1 Performing an inevitable task generally is not something pleasurable, especially under the comparison with chilling out. When multiple choices are available at the moment, we tend to pick the activity that generates the most pleasure and the least pain. For example, on Friday afternoon, I watched a movie instead of doing homework that will be due on Sunday because movie-watching is more pleasurable. However, on Sunday, if the homework hasn't been finished , the pleasure generated by movie-watching is significantly reduced due to the anxiety arising from thinking about the horrible outcomes of not completing the assignment on time (Deadline Assumption 1). Thus, at this point, I would definitely choose to do the homework despite the fact that it's still annoying, since the alternatives are even more painful!

Explanation 2 As rational human beings, we tend to minimize the painful period and extend the happy moments. Besides, when performing a task, most of us possess the ability to evaluate efficiency and roughly predict the completion time based on such efficiency. Since the anxiety of approaching deadlines generates the highest efficiency, we tend to put the task to the last minutes. Therefore, we can come over the painful periods with the highest efficiency and shortest amount of time!

### (b) Model 1: Choosing the most pleasurable activity

Assume we have multiple activities available to choose at the moment and the PLEASURE VALUE (at the moment)is evaluated by:

$$\text{Pleasure Value} = \text{Inherent Pleasure Value} + \text{Attached Pleasure Value}$$

The inherent pleasure value won't change under any conditions, while the attached pleasure value may vary under different times and occasions. It's worth to notice that the PLEASURE VALUE can be either positive and negative.

For example, the inherent pleasure of movie-watching is 15 points to me. If I have a friend to do this activity together, the pleasure point will increase to 18 points with 3 attached points generated from the companion. Also, if a deadline is approaching, the pleasure point may drop, even under 0 due to the anxiety. Therefore, the pleasure value of movie-watching on Sunday may look like:

$$-20 = 15 \text{ (inherent)} + (-35) \text{ (attached anxiety)}$$

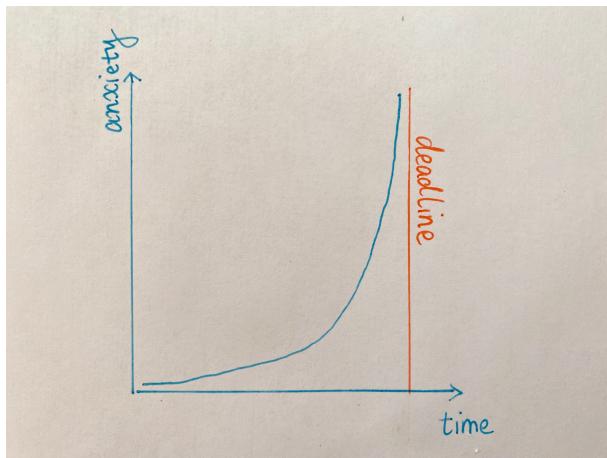
Similarly, on Sunday, the pleasure value of doing homework is:

$$-15 = -20 \text{ (inherent)} + 5 \text{ (attached satisfaction from getting started)}$$

At this point, since  $-15$  is higher than  $-20$ , I would choose to do homework over watching movies.

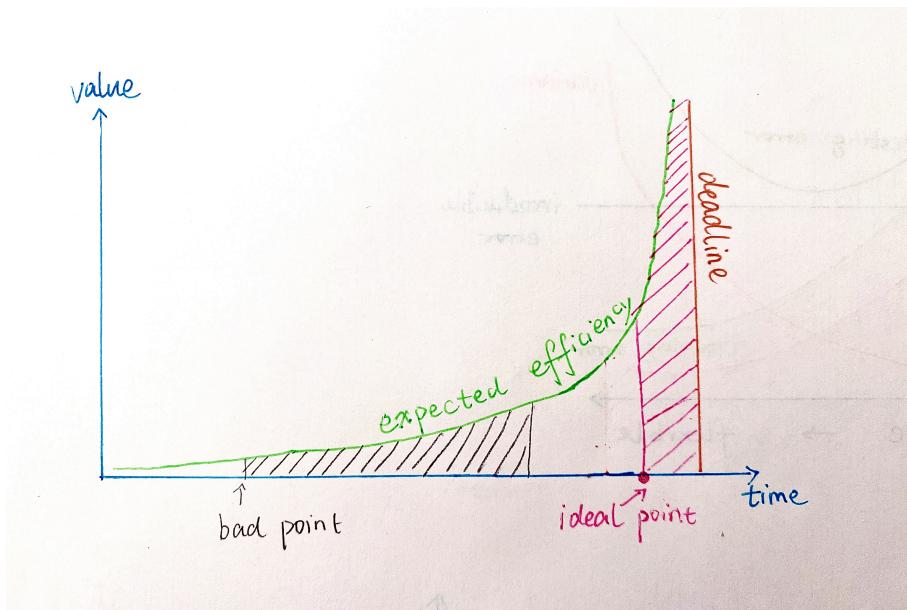
Besides, we also need to propose a model for the relationship between the deadline and the anxiety:

**As the deadline approaches, the anxiety increases exponentially.**



Therefore, only when the deadline is close, the anxiety can SIGNIFICANTLY decreases the pleasure value of doing other activities and makes doing the tasks the best choice at the moment. Therefore, we tend to do things at the last minute.

### (c) Model 2: Shortening the painful period



To begin with, let's re-examine the assumption about the deadlines:

**As the deadline approaches, the anxiety increases exponentially.**

Also, it's worth to notice that:

$$\text{Amount of output} = \text{Efficiency} \times \text{Time}$$

Since our goal is to shorten the painful period, the ideal point to start is the point that we manage to utilize all the high-efficiency period before the deadline (illustrated by pink in the graph above), under the condition that the assignment is expected to be finished on-time. From the illustration above, we can see that this last-minute starting point has a shorter working time than that of the bad point (color grey).

To conclude, we push the tasks to the last minute because we wish to utilize the high efficiency to shorten the painful period.

#### (d) Condition 1

Assume now is a week from the deadline, and the bad weather locks me in the room at the moment. I can either watch a movie or do my homework. Again, assume that the bad weather disrupts the internet and makes watching movies really annoying. Thus, the pleasure value of watching movies becomes:

$$\text{Movie watching: } -30 = 20 - 50$$

However, the satisfaction gained from starting early increases the pleasure value of doing homework:

$$\text{Doing homework: } -10 = -20 + 10$$

Therefore, under model 1, I would choose to do the homework rather than movie-watching, even though it's not a minute from the deadline.

Contrastively, if model 2 is correct, I would still not start the assignment because I don't expect the efficiency of doing the homework is high.

#### Condition 2

Assume now that I get a weird assignment which would be due a month later: Keep standing up for 20 minutes. If model 1 is correct, I am not very likely do it right now because the anxiety isn't large enough to prioritize the activity. However, if model 2 is correct, I am very likely to start it right now because the efficiency has reached the max (because it's constant) already.

## Question 3: Selecting and fitting Model

### 3.1 Flexible vs Inflexible Models

- (a) A FLEXIBLE model would perform better.

On the one hand, a flexible model may reduce bias. On the other hand, since there's a large sample size and a small number of predictors may help, it's not so likely to get over-fitting.

- (b) An INFLEXIBLE model would perform better.

Due to the small sample size, it's very likely that a flexible model would cause overfitting.

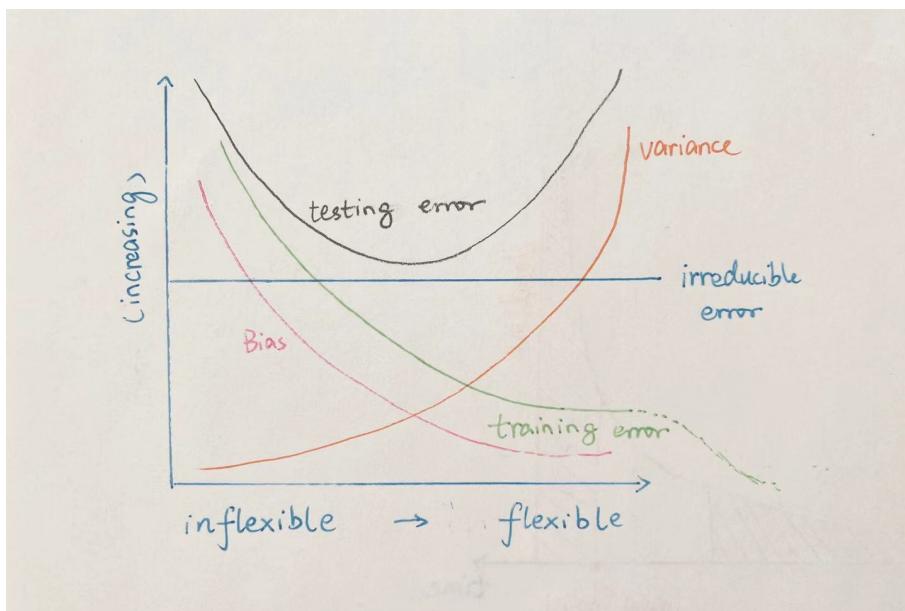
- (c) A FLEXIBLE model would perform better.

If the relationship is linear, the inflexible model will work fine. However, for the non-linear effect, we can expect that using the inflexible model would cause a biased model with significant variation. Thus, we have no choice but a flexible one.

- (d) An INFLEXIBLE model would perform better.

Since the variation is considerable, using the flexible model will cause us to fit too much of the noise in the problem.

## 3.2 Five curves



- Bias

By definition, bias refers to the constant error at all points and whose significant existence indicates that the model isn't complex enough to capture the data set. With more a flexible model, more considerations are taken and, thus, become better at approximating real-life problems. Therefore, bias will decrease as the model become more flexible.

- Variance

Variance describes how much a model changes when we train it using different portions of the data set. Since employing a more flexible model is more likely to fit the noises of the data, as a result, using an alternative training data set would generate a very different outcome, which means a higher degree of variance. Therefore, generally,

variance would increase as the model become more flexible. Besides, above a certain point, an over-flexible model may catch too much noise from the training dataset. Thus, the variance would increase significantly.

- Training Error

A more flexible model will fit the data more closely. Therefore, the training error would decrease as the model increases flexibility. Also, the training error can ultimately reduce to 0 with a very flexible model.

- Testing Error

The curve first decreases to reach an 'ideal point' (as the flexibility reduces bias) and then increases (as the flexibility causes the problem of over-fitting). The 'ideal point' locates at the point where the bias-variance trade-off reaches a balance point.

- Irreducible Error

Irreducible error is a measure of the amount of the noise in the data and, just as its name suggested, is irreducible no matter how good our models are. Thus, its value remains constant.