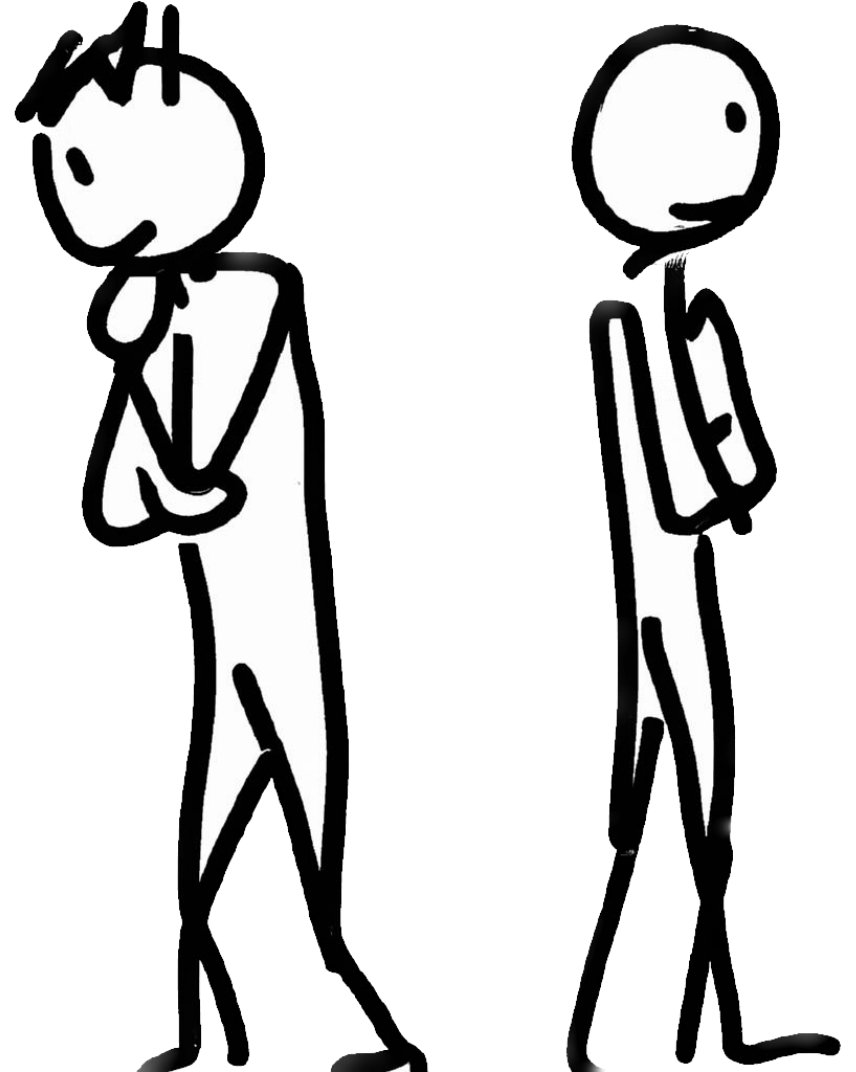
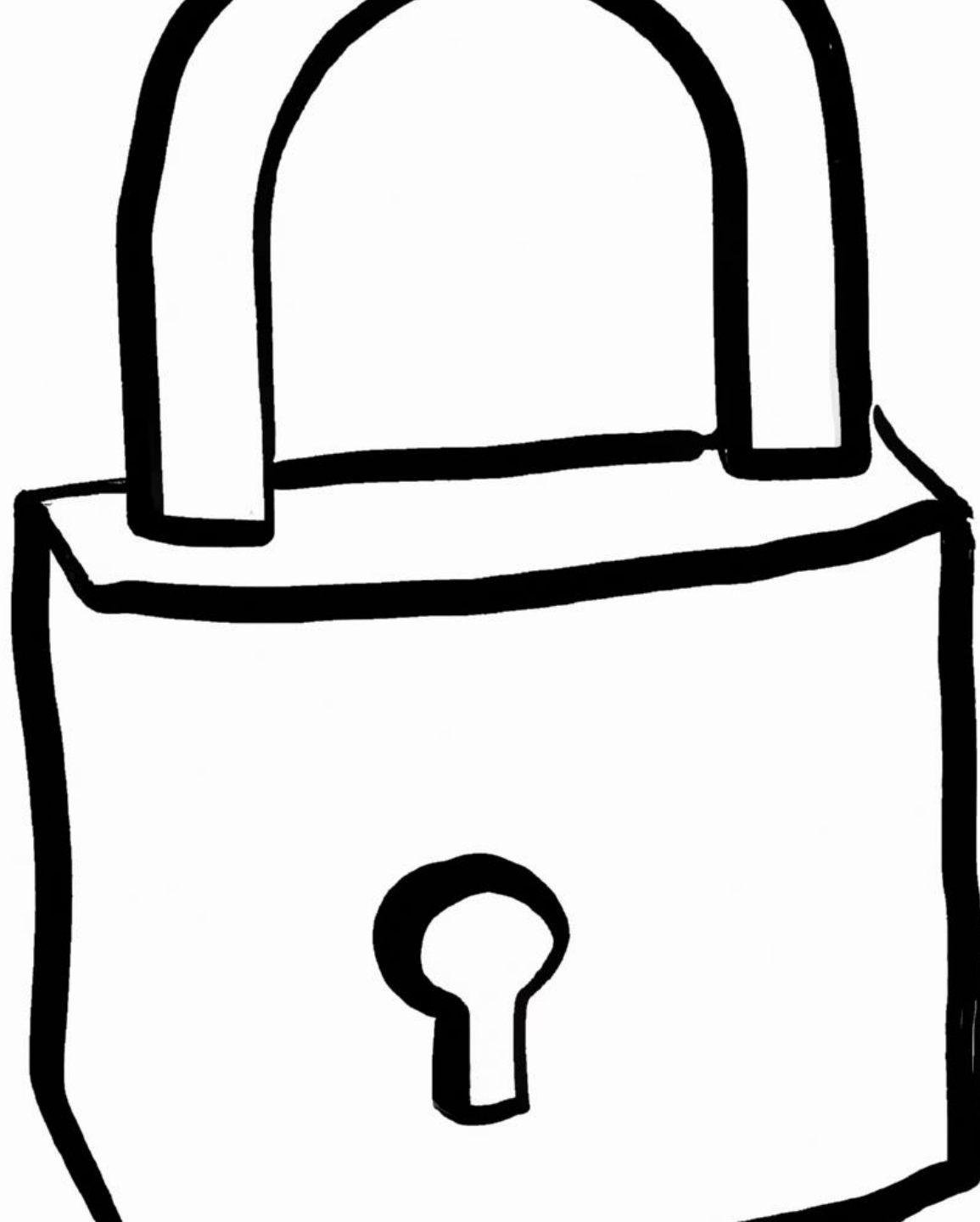


# Commitment

Notes on Behavioural Economics

Jason Collins





- Depress the value of the bad course of action
- Increase the value of the optimal course of action
- Force the agent to maintain the optimal course of action

$$\beta = 0.5$$

$$\delta = 1$$

$$\beta = 0.5$$

$$\delta = 1$$

$$u(\text{OK}) = 6$$

$$u(\text{good}) = 10$$

$$u(\text{great}) = 16$$

$$\begin{aligned}U_1(1, \text{good}) &= u(\text{good}) \\ &= 10\end{aligned}$$

$$\begin{aligned}U_1(2, \text{great}) &= \beta \delta u(\text{great}) \\&= 0.5 \times 1 \times 16 \\&= 8\end{aligned}$$

$$U_1(1, \text{good}) = 10 > 8 = U_1(2, \text{great})$$



$$\begin{aligned}U_0(0, \text{OK}) &= u(\text{OK}) \\ &= 6\end{aligned}$$

$$\begin{aligned}U_0(1, \text{good}) &= \beta \delta u(\text{good}) \\&= 0.5 \times 1 \times 10 \\&= 5\end{aligned}$$

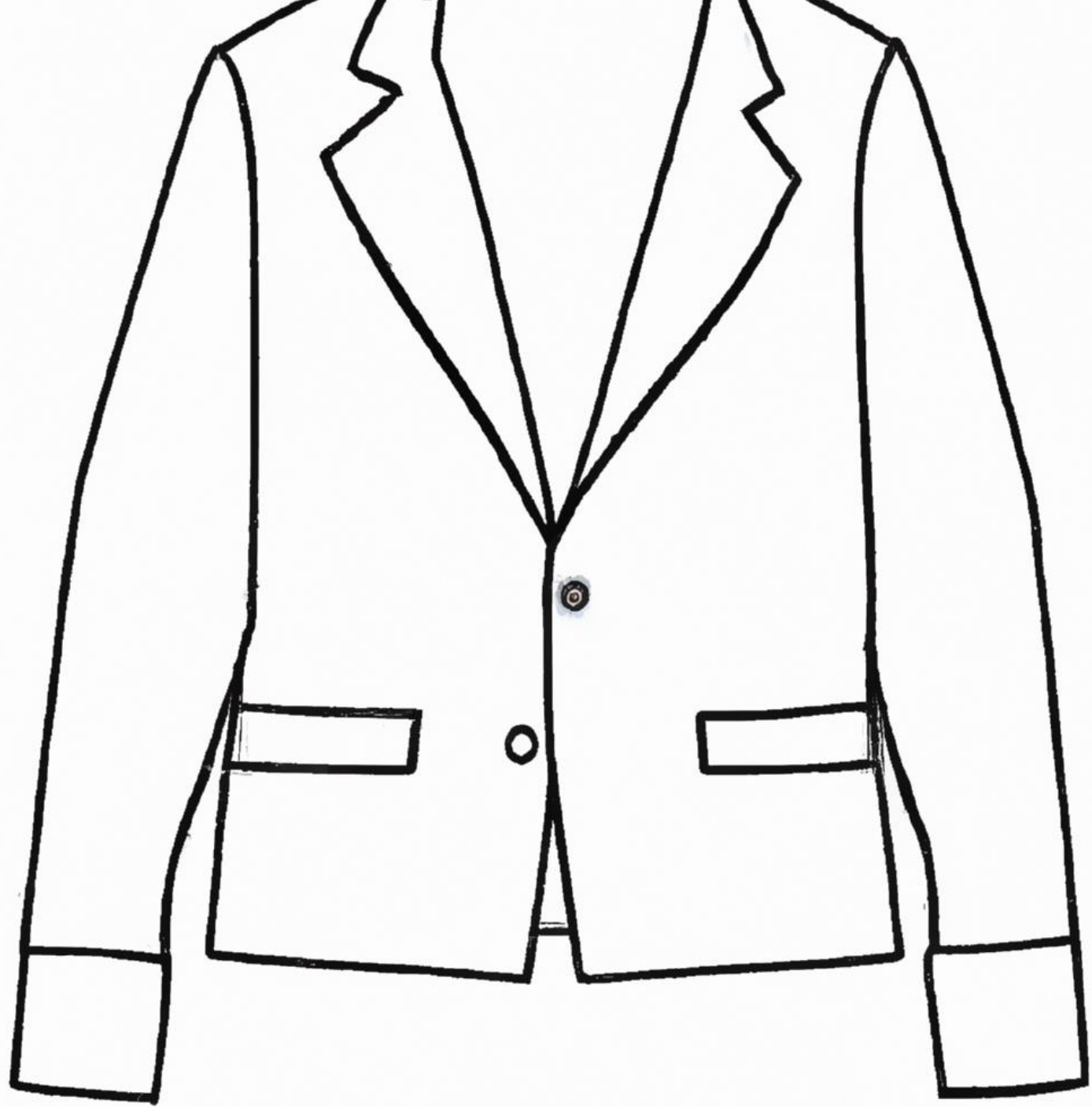
$$U_0(0, \text{OK}) = 6 > 5 = U_0(1, \text{good})$$

$$\begin{aligned}U_0(2, \text{great}) &= \beta \delta^2 u(\text{great}) \\&= 0.5 \times 1^2 \times 16 \\&= 8 \\&\geq 6 = U_0(0, \text{OK})\end{aligned}$$



$$\beta = 0.5$$

$$\delta = 1$$



	<b><i>t = 0</i></b>	<b><i>t = 1</i></b>	<b><i>t = 2</i></b>
Save	0	0	45
Spend	10	10	10

Naïve

$$\begin{aligned}U_0(\text{Save}) &= 0 + \beta\delta \times 0 + \beta\delta^2 \times 45 \\&= 0.5 \times 45 \\&= 22.5\end{aligned}$$



Naïve

$$\begin{aligned}U_0(\text{Spend}) &= 10 + \beta\delta \times 10 + \beta\delta^2 \times 10 \\&= 10 + 5 + 5 \\&= 20\end{aligned}$$

Naïve

$$U_0(\text{Save}) = 22.5 > 20 = U_0(\text{Spend})$$

	<b><i>t</i> = 1</b>	<b><i>t</i> = 2</b>
Save	0	45
Spend	20	10

Naïve

$$U_1(\text{Save}) = 0 + \beta\delta \times 45$$

$$= 0.5 \times 45$$

$$= 22.5$$

$$\begin{aligned}U_1(\text{Start spending at } t = 1) &= 20 + \beta\delta \times 10 \\&= 20 + 5 \\&= 25\end{aligned}$$

Naïve

$$U_1(\text{Save}) = 22.5 < 25 = U_1(\text{Start spending at } t = 1)$$

	<b><i>t = 0</i></b>	<b><i>t = 1</i></b>	<b><i>t = 2</i></b>
Save	0	0	45
Start spending at t=1	0	20	10
Spend	10	10	10

Sophisticated

$$\begin{aligned}U_1(\text{Start spending at } t = 1) &= 20 + \beta\delta \times 10 \\&= 20 + 5 \\&= 25\end{aligned}$$



Sophisticated

$$U_1(\text{Save}) = 0 + \beta\delta \times 45$$

$$= 0.5 \times 45$$

$$= 22.5$$

Sophisticated

$$U_1(\text{Start spending at } t = 1) = 25 > 22.5 = U_1(\text{Save})$$

Sophisticated

$$\begin{aligned}U_0(\text{Start spending at } t = 1) &= 0 + \beta\delta \times 20 + \beta\delta^2 \times 10 \\&= 0.5 \times 20 + 0.5 \times 10 \\&= 15\end{aligned}$$

Sophisticated

$$\begin{aligned}U_0(\text{Spend}) &= 10 + \beta\delta \times 10 + \beta\delta^2 \times 10 \\ &= 10 + 0.5 \times 10 + 0.5 \times 10 = 20\end{aligned}$$

Sophisticated

$$U_0(\text{Spend}) = 20 > 15 = U_0(\text{Start spending at } t = 1)$$

	<i><b>t = 0</b></i>	<i><b>t = 1</b></i>	<i><b>t = 2</b></i>
Save	0	0	45
Start spending at t=1	0	20	10
Spend	10	10	10
Lay-by	-1	0	45

Sophisticated

$$\begin{aligned}U_0(\text{Start spending at } t = 1) &= 0 + \beta\delta \times 20 + \beta\delta^2 \times 10 \\&= 0.5 \times 20 + 0.5 \times 10 \\&= 15\end{aligned}$$

Sophisticated

$$\begin{aligned}U_0(\text{Spend}) &= 10 + \beta\delta \times 10 + \beta\delta^2 \times 10 \\&= 10 + 0.5 \times 10 + 0.5 \times 10 \\&= 20\end{aligned}$$



Sophisticated

$$\begin{aligned}U_0(\text{Lay-by}) &= -1 + \beta\delta \times 0 + \beta\delta^2 \times 45 \\&= -1 + 0 + 0.5 \times 45 \\&= 21.5\end{aligned}$$

Sophisticated

$$U_0(\text{Lay-by}) > U_0(\text{Spend}) \geq U_0(\text{Start spending at } t = 1)$$



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your Goals?

I commit to

Select your Goal...



GO



57M

dollars on the line



568K

Commitments  
created



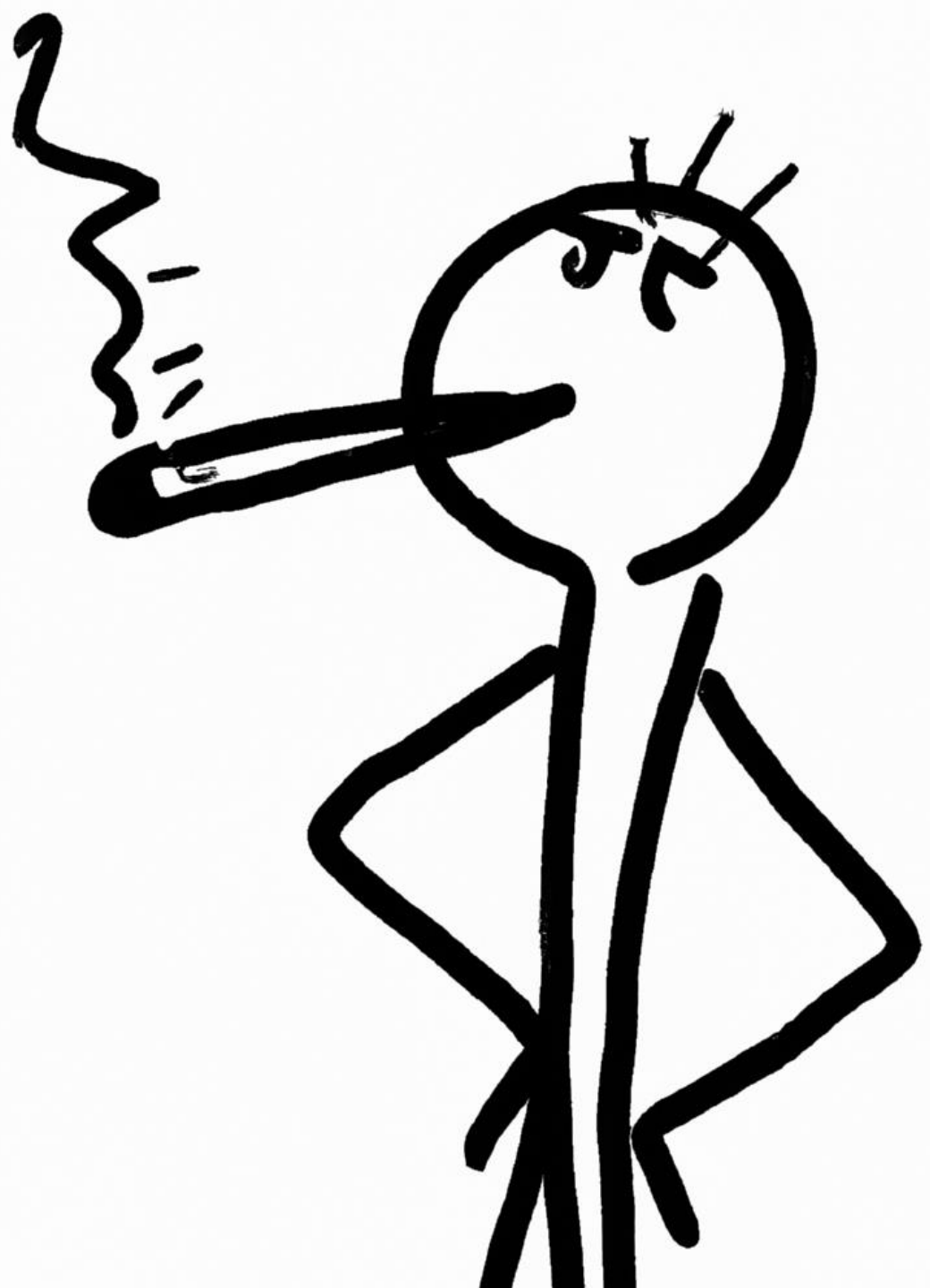
1M

workouts  
completed



50M

cigarettes not  
smoked



$$\beta = 0.5$$

$$\delta = 1$$

$$\beta = 0.5$$

$$\delta = 1$$

$$u(\text{smoking}) = 5$$

$$u(\text{healthy}) = 8$$

$$\begin{aligned}U_1(\text{smoking}) &= u(\text{smoking}) \\ &= 5\end{aligned}$$

$$\begin{aligned}U_1(\text{healthy}) &= \beta\delta \times u(\text{healthy}) \\ &= \beta\delta \times 8 \\ &= 4\end{aligned}$$

$$\begin{aligned}U_0(\text{smoking}) &= \beta\delta \times u(\text{smoking}) \\&= \beta\delta \times 5 \\&= 2.5\end{aligned}$$

$$\begin{aligned}U_0(\text{healthy}) &= \beta\delta^2 \times u(\text{healthy}) \\&= \beta\delta^2 \times 8 \\&= 4\end{aligned}$$





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GO



57M

dollars on the line



568K

Commitments  
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1M

workouts  
completed



50M

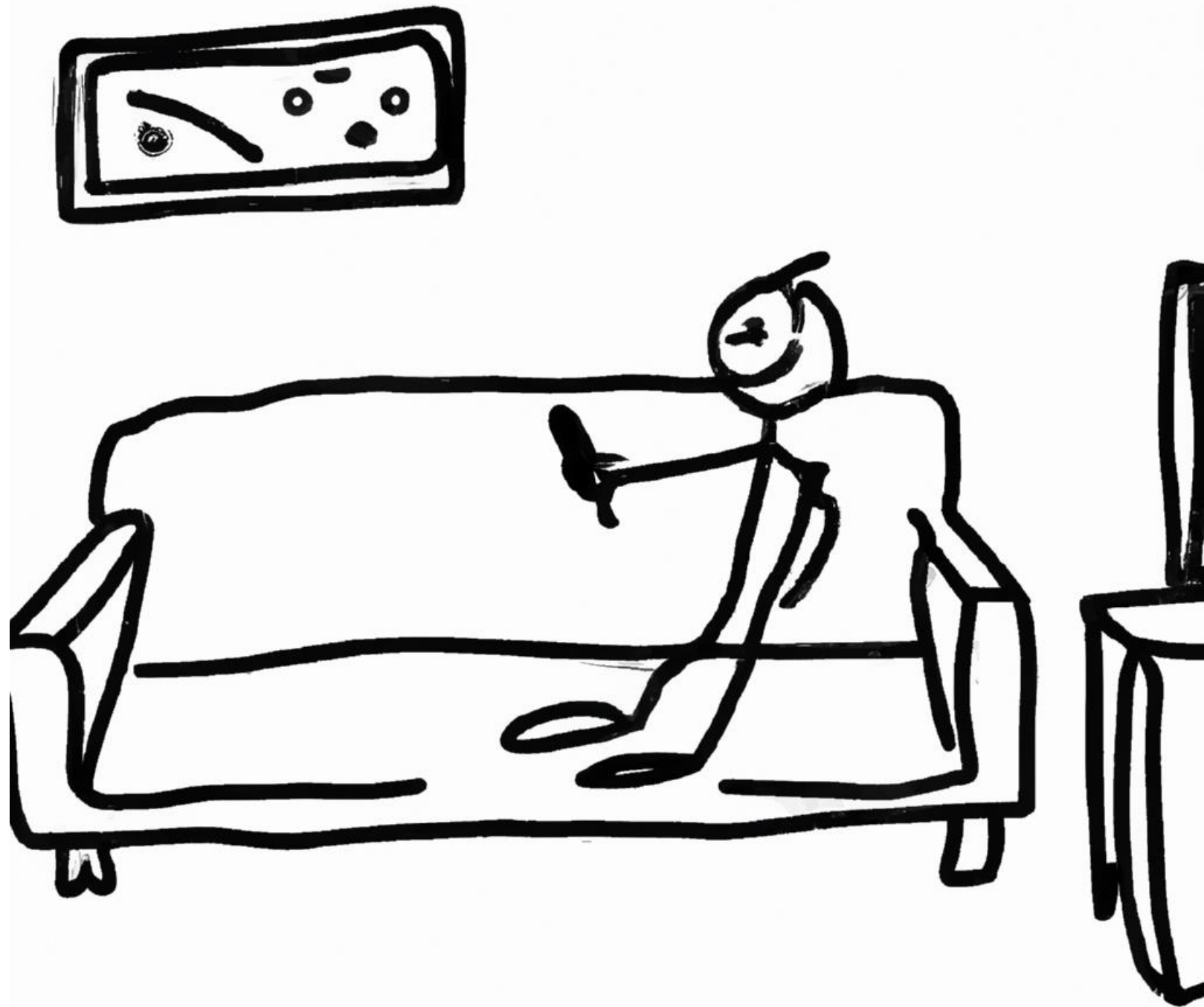
cigarettes not  
smoked

$$\begin{aligned}
 U_1(\text{stickK} + \text{smoking}) &= u(\text{smoking}) + \beta\delta \times u(\text{lost stake}) \\
 &= 5 + \beta\delta \times (-5) \\
 &= 2.5
 \end{aligned}$$

$$\begin{aligned}
 U_1(\text{stickK} + \text{healthy}) &= \beta\delta \times u(\text{healthy}) \\
 &= \beta\delta \times 8 \\
 &= 4
 \end{aligned}$$

$$\begin{aligned}
 U_0(\text{smoking}) &= \beta\delta \times u(\text{smoking}) \\
 &= \beta\delta \times 5 \\
 &= 2.5
 \end{aligned}$$

$$\begin{aligned}
 U_0(\text{stickK} + \text{healthy}) &= \beta\delta^2 \times u(\text{healthy}) \\
 &= \beta\delta^2 \times 8 \\
 &= 4
 \end{aligned}$$



$$u(\text{exercise}) = 0$$

$$u(\text{television}) = 6$$

$$u(\text{healthy}) = 12$$

$$u(\text{unhealthy}) = 12$$

$$\beta = \frac{1}{2}$$

$$\delta = \frac{2}{3}$$

$$U_0(\text{exercise}) = u(\text{exercise}) + \beta \delta u(\text{healthy})$$

$$= 0 + \frac{1}{2} \times \frac{2}{3} \times 12$$

$$= 4$$

$$U_0(\text{television}) = u(\text{television}) + \beta \delta u(\text{unhealthy})$$

$$= 6 + \frac{1}{2} \times \frac{2}{3} \times 0$$

$$= 6$$



$$U_0(\text{exercise} + \text{massage}) = u(\text{exercise}) + u(\text{massage}) \\ + \beta \delta u(\text{healthy})$$

$$= 3 + \frac{1}{2} \times \frac{2}{3} \times 12$$

$$= 7$$