European Journal of Science and Theology, August 2022, Vol.18, No.4, 121-131

A THEOLOGICAL NEWCOMB'S DILEMMA

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(Received 16 February 2022, revised 26 May 2022)

Abstract

In this paper, I will argue that the agnostic decision-maker may find himself in a Newcomb-type situation concerning the doctrine of Roman Catholicism. Consequently, if the agnostic wishes to decide according to the causal decision theory, he should refrain from living the Christian life, but if he follows the evidential decision theory, he should follow the Catholic life guidance. In the argument, I have cast the role of Newcomb's predictive machine as Divine omniscience.

Keywords: Newcomb's dilemma, Causal Decision Theory, Evidential Decision Theory, Agnosticism

1. Introduction

Our naive and ordinary intuition about rational decision-making is that if the decision-maker has the full information, time and cognitive resources available, he can make an ideal rational decision. Newcomb's dilemma challenged this fundamental assumption, which typically used to be accepted in Economics, Psychology and Philosophy. In his 1969 article, Nozick presented a thought experiment in which the decision-maker is fully informed has sufficient time and cognitive resources at his disposal, yet two opposing decision alternatives are equally rational [1]. It seems that two paradigms of decision theory, which in most cases predict the same action, conflict: evidential and causal decision theory.

Since then, several approaches have aimed to solve or eliminate the dilemma. Traditionally, one group of philosophers advocates evidential decision theory [2-4] but is also criticized by [5, 6], while the other school of philosophers promotes causal decision theory [2, 3, 7]. Some dispute the causal decision theory but are not committed to the evidential one [8]. Some see the debate as conceptually undecidable [9, 10]. Others find the root of the problem not in rationality but in epistemic inaccessibility [11, 12]. A minority, however, argues that the two theories of decision-making can still be essentially reconciled under certain specific conditions [13]. And on the logical spectrum, some seek to develop a third new decision theory that resolves Newcomb's dilemma [14]. Finally, some people, including myself in this article, attempt to translate this

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somewhat abstract thought experiment into the decision-making dilemma that may also be present in everyday life [15-21].

In this paper, I will argue that the agnostic decision-maker may find himself in a Newcomb-type situation concerning the doctrine of Roman Catholicism. Consequently, if the agnostic wishes to decide according to the causal decision theory, he should refrain from living the Christian life, but if he follows the evidential decision theory, he should follow the Catholic life guidance. In the argument, I have cast the role of Newcomb's predictive machine as Divine omniscience.

First, I will present Newcomb's original thought experiment and then detail the arguments of evidentialist and causal decision theory that seek to define ideally rational action. I then present a realistic and well-known Newcomb's dilemma in macroeconomics, which exemplifies the dilemma in everyday life. I will then provide an in-depth analysis of the logical structure of Newcomb's dilemma and identify the conditions necessary for the paradox to arise. In the light of all this, I will finally present a theological Newcomb's dilemma.

2. The original Newcomb's dilemma

An ideal rational agent should choose between: (i) an opaque box in front of her or (ii) the same opaque box and a transparent box containing 1,000 dollars. It is known that yesterday, a machine with an excellent record - assuming 99% correct - of predicting human behaviour foresaw the agent's decision. If it predicts that the agent will only choose what is in an opaque box, it places $1 million in it. Nevertheless, if it foresees that the agent will take both boxes simultaneously, then the machine puts nothing in. In the agent's deliberation process, she learned that the machine's past predictions are quite reliable, so most (though not all) of its predictions of each type are correct, depending on its predictions or past participants. Should the agent only take the contents of one opaque box or both boxes? The matrix summarizing the possibilities of the agent is found in Table 1.

Table 1. The payoff of the original Newcomb' dilemma.

The agent's choices	The machine predicts one boxing	The machine predicts two boxing
One boxing	$1,000,000	0
Two boxing	$1,001,000	$1,000

A compellingly plausible answer to whether the one-box or the two-box strategy is rational is crystal clear to everyone in the scenario just described. However, the serious difficulty is that almost half of the people will choose the one-box option and half the other half the two-box option. As such, they may legitimately believe that the other group is wrong [1, p. 117]. Perfectly rational

reasons can be found for both strategies depending on which principle is used to select the rational choice. These are the following.

On the one hand, we have two theories that define two different decisions in this situation. The Evidential Decision Theory (EDT) says that "the rational act is whichever available one is the best evidence of what you want to happen" [22]. So, if one acts according to EDT, then the agent believes its action must be evidentially relevant to the state of affairs that the agent desires. On the other hand, Causal Decision Theory (CDT) suggests that "the rational act is whichever available one is most likely to cause what you want to happen" [22]. So, if another person behaves according to CDT, the agent believes that his or her actions must have a causal effect on the state of agent wants.

Up until Nozick's 1969 article [1], these two theories always identified the same action as rational among the possible alternatives. Economists and philosophers considered the two principles interchangeable, illuminating one side of the same coin. However, the Newcomb dilemma shows that the two decision theories in this situation prescribe sending action. This is how the paradox arises.

3. Different rationalities

Since the Newcomb paradox is not intended to address the issues of free will and determinism, we are left with the assumption that the miraculous being we have just described cannot predict human behaviour perfectly. The being only predicts 99% accurately. Suppose we reason as follows in the situation just sketched: if it is true, and it is true, that the machine predicts with 99% accuracy and is wrong with a 1% chance of being wrong, then the probability-weighted utility of the one-box strategy chosen by the agent is 990,000. In this case, the agent believes that if he chooses a box that the machine predicted yesterday with 99% accuracy and the expected utility is 1 million, then 0.99 * 1,000,000 = 990,000. In that case, if the agent were to choose the two-box strategy while the machine predicted one box, he would also have to rely on the machine being wrong, which is a 1% chance. Under this scenario, the expected utility is $1,001,000, which is weighted by probability is: 10,100 (0.01 * 1,001,000). Since the probability-weighted utility of the one-box strategy is 990,000 and the two-box strategy is 10,100, it would be completely irrational to choose the two-box strategy. Thus, the one-box strategy should be chosen.

Since the agent wants to maximize its profits in such a situation, further options are irrational in light of the expected utilities. The two-box strategy is not reasonable for the agent since its utility is only $1,000. The probability-weighted utility for this branch is 990 (0.99 * 1,000). Moreover, the one box strategy is meaningless because the expected utility is 0, and so the expected utility is 0.

The reasoning just given is evidential decision theory. According to this theory, the knowledge that the machine predicts with 99% certainty was sufficient evidence for the agent to choose the alternative course of action that is most likely to yield the highest expected utility based on the available evidence.

On this basis, it would be wholly irrational and against the existing probabilities to choose the two-box strategy! Or maybe not?

To understand the two-box strategy, it is important to clarify the thesis of the causal independence of certain facts. This can be illustrated by an example: correlation is not the same as causality. Meteorologists' predictions about today's weather are based on independent facts. In other words, the forecast does not in any way cause today's sunny fine weather. The correlation between the forecast and the nice weather is established for a common reason: a certain state of the atmosphere in conjunction with other meteorological facts. Accordingly, in the case of Newcomb's dilemma, argues the two-box strategy of following the machine's forecast, it does not at all cause the agent's present-day decision. Like the weather, the agent's decision is based on independent facts (a prior description of the world).

Therefore, following the two-box strategy, we should reason that: whatever the agent is doing today, the machine has already made its decision (independent fact) and has put $1M or has not put anything in the opaque - black box (independent fact). If you like, the die is cast. Like the meteorologist's prediction and today's weather, the agent's prediction has nothing to do with what decision the agent now makes! In light of this, we have two possibilities: either the agent takes one box or two.

If the agent follows the one-box strategy, he will get $1M or nothing since the agent either did or did not put $1M in the black opaque box. However, if the actor follows the two-box strategy, he will receive $1,001,000 or $1,000. Given all this, it would be completely irrational to choose the one box strategy; the only rational choice is the two box strategy.

As we have seen, there are compelling arguments for both the one-box and the two-box strategies. The seriousness of the dilemma lies in the fact that we have two conflicting theories of the rational choice theory that fundamentally affect the principles used in macroeconomics [15].

4. A more realistic case of Newcomb's dilemma

Suppose that the board of a National Bank (NB) of a given country, responsible for monetary policy, financial stability, and credit promotion, has to decide whether to increase the money supply (which implies that the bank, in order to lend money, has to reduce the number of funds it has to hold in reserve against deposits.) However, increasing the money supply has several distinct advantages. According to standard macroeconomics, increasing the money supply increases employment. However, the decision-maker's council is faced with a dilemma because, let us suppose; there is a strong probabilistic correlation between the money supply and public expectations. In essence, the dilemma is that public expectations predict the central bank committee's decision with high probability. This has the result that if the bank increases the money supply, the public has predicted that it will lead to inflation. Conversely, suppose the central bank does not expand the money supply (and does not reduce it), which is also

accurately predicted by public opinion. In that case, the status quo is the most likely outcome. In the event that the bank surprises the public by not expanding the money supply, this will lead to an economic recession. The most favourable outcome of the above situation (employment growth) is if the NB surprises the public by expanding the money supply when everyone expects the NB not to do so [16]. Table 2 can summarize the Newcomb-type problem. (For ease of interpretation, Broome has assigned numbers to expected utilities in the matrix.)

Table 2. The payoff table of a macroeconomics Newcomb' dilemma.

The NB's choices	**Public does not expect increasing the money supply**	**Public expects increasing the money supply**
NB does not increase the money supply	Status quo (9)	Recession (0)
NB increases the money supply	Employment is growing (10)	Inflation (1)

It is easy to see that this example is a Newcomb situation since whatever decision the NB board makes - in this fictitious case - seems irrational from a decision-theoretic point of view. Let us examine how the evidential decision theory prescribes for the board.

Suppose the public is reasonably well informed and has a correct idea of the laws of macroeconomics, so it predicts correctly with a 70% chance and is wrong with a 30% chance whether the NB will expand the money supply or not. Therefore, the board must reason accordingly, similarly to the original Newcomb's dilemma, given the fictitious utilities ('0', '1', '9', '10'). (Note that altering these fictitious utilities may result in the economic Newcomb's dilemma does not occur.) If the NB thinks it is best to not-expand, which is predicted by the public with 70% accuracy, and the maximum utility is '9', then the expected utility (since 0.7 * 9) is 6.3. However, in the case where the council chooses the expansion strategy while the public has also predicted not-expand, the council must assume that the public is wrong, with a 30% chance of being wrong. Under this scenario, the maximum utility is '10', which yields 3 (0.3 * 10) when weighted by probability. Since the expected utility of the no-expansion strategy is 6.3, while the expansion strategy has a utility of 3, it would be utterly irrational for the council to push for expansion. According to the evidential decision theory, therefore, the council should opt for the expansion strategy, as the knowledge that the public predicts with 70% certainty provides the NB with sufficient evidence.

Before moving on to the argument in favor of causal decision theory, it is essential to emphasize that certain facts are causally independent. Just as the predictions of meteorologists do not cause the sun to shine, the predictions of the machine in the Newcomb example do not cause the actor's decision. So the prediction of public opinion does not cause the council's decision. Just as the correlation between the prediction and the weather is well-founded for a

common reason (the biosphere's condition in combination with other meteorological facts), the correlation between the public's predictions and the NB's decision is well-founded for certain underlying macroeconomic facts.

The NB board may also reason by making its decision consistent with causal decision theory. Whatever it decides, the public already has a firm idea - one way or another - of what it will do. The die is cast if you like, and society's choice/investor preference has already been decided. Therefore, the public's prediction - like the meteorologist's prediction and today's weather - should have nothing to do with what the NB decides! With this in mind, the council has two options to consider. If the council decides against expansion, the result is either status quo (9) or recession (0). If the NB opts for the expansion strategy, the result will either be an increase in employment (10) or inflation (1). After all, it would be entirely irrational to refrain from expansion, so the only rational decision is for the board to vote for expansion, in line with causal decision theory.

5. The structure of the Newcomb's dilemma

Before presenting the theological Newcomb's dilemma, it will first be necessary to define the conditions under which the decision-maker is confronted with this paradox of choice. First, it is essential to recognize that there must always be a given predictive agent who makes reliable predictions about the decision-maker's future choices. Furthermore, there must also be a decision-maker who knows the predictions of the predictor and their expected probability.

In each case, the decision-maker decides whether to perform the action predicted by the predictor or whether to act against it. The expected probabilities are then determined in the light of this: if the decision-maker acts in accordance with the predictor's prediction, the probability is (significantly) higher than if he acts against it.

Expected utilities are also interpreted in terms of the relationship between the decision-maker and the predictor. If, say, the predictor predicts that the actor will refrain from doing X and the decision-maker also refrains from doing X, then the expected utility is desirably high. The utility is higher only if the decision-maker decides and performs action X against the expected probability and the predictor. However, if the predictor predicts that the decision-maker will perform action X, but the agent does not do so - which again is the least likely - then the decision agent will have the most negative outcome. However, if the predictor predicts the performance of action X, and the decision-maker chooses X, then the positive payoff is slightly higher than zero.

Table 3 shows the distribution of expected utilities, where the smiling faces represent the amount of value.

Table 4 shows the probability distribution of the predictor's predictions. Note also that the probabilities of the expected utilities are always as follows: $p\theta > p\lambda$ and also $p\theta + p\lambda = p1$.

Table 3. The distribution of expected utilities.

The decision-maker's choices	Predictor predicts non-X	Predictor predicts X
Decision-maker non-X-ing	:) :)	:(
Decision-maker X-ing	:) :) :)	:)

Table 4. The probability distribution of the predictor's predictions.

The decision-maker's choices	Predictor predicts non-X	Predictor predicts X
Decision-maker non-X-ing	$p\theta$	$p\lambda$
Decision-maker X-ing	$p\lambda$	$p\theta$

6. A theological Newcomb's dilemma

I have nothing left to do but to present a Newcomb situation that satisfies the conditions just presented - posing a Newcomb-style dilemma - and at the same time presents an insoluble decision paradox for the agnostic who is uncertain whether to live a Roman Catholic Christian life or not.

In order to see Newcomb's theological dilemma, some preliminary remarks are also necessary. The first and most obvious of these remarks has to do with divine foreknowledge. That is, if God exists in the Roman Christian sense, then divine foreknowledge is 100% (as opposed to Nozick's supercomputer, which has a 1% chance of being wrong). However, God is perfect and infallible. At first sight, this makes it impossible to create a theological Newcomb's dilemma since it requires the predictor to be wrong to some extent.

Therefore, instead of introducing objective probabilities, we should introduce the notion of credence through subjective probabilities: "Our beliefs come in degrees; we believe some things more strongly than others. For instance, I believe that the sun will rise tomorrow very slightly more strongly than I believe that it will rise every morning for the coming week; and I believe both of these propositions much more strongly than I believe that there will be an earthquake tomorrow in Bristol. We call the strength or the degree of our belief in a proposition our credence in that proposition." [23]

An agnostic is a person "who does not commit himself to believe in the existence or non-existence of either God or a god" [*Agnostic Definition & Meaning*, Merriam-Webster, https://www.merriam-webster.com/dictionary/agnostic, accessed on 9.02.2022]. Therefore, the certainty of the existence of God expressed in agnostic credences is exactly 50%. The agnostic is 50% certain of God's existence and 50% certain that he does not exist.

It follows from the conjunctive probability theorem that if the agnostic is 50% sure of God's existence and if God exists, then He predicts the agent's behaviour with 100% accuracy, then the agnostic has 50% certainty of God's foreknowledge (since $0.5 * 1 = 0.5$). Hence, from the agnostic's perspective, any predictions of God are true with 50% probability. Furthermore, this result is just sufficient for the agnostic to have a Newcomb's dilemma since the subjective

nature of his decision determines his choice. Therefore, it is not necessary for the predictor to predict the agent's behaviour with objective probability. It is sufficient for a person to face a Newcomb's dilemma if the decision-maker assigns some subjective probabilities to the prediction.

It is also essential to assume another subjective feature of the agnostic's decision dilemma. In order to satisfy the conditions of Newcomb's dilemma, the agent's preferences must hold the following or an equivalent pattern.

Suppose that the agnostic makes the following assumptions about Roman Catholic doctrine. Since Heaven for a mortal being is difficult to understand due to one's cognitive limitations, the decision-maker assigns a one-million 'happiness point' to the possibility that he will go to Heaven. The agent further allocates minus fifty points to the Christian life of the believer, as it imposes on him abstinence from some worldly pleasures and additional burdens (Sunday worship, communion, confession). In addition, the agnostic gives the life of worldly pleasures and freedom from moral restraint an extra one hundred points. And finally, the possibility of going to Purgatory is interpreted by the decision-maker as minus two hundred points, as he speculates that if there is a God and Purgatory, then surely one must suffer twice as much there as the happiness that came with a life of worldly pleasures.

It is important to note that the expected utilities from these ideas are somewhat arbitrary and represent only the convictions of the particular, in this case fictitious, agnostic decision-maker. Nevertheless, this arrangement of expected utilities and preferences is crucial to the argument. It must also be acknowledged that the ordinary decision-maker does not make his choice along with such cardinal preferences [24], but rather by means of ordinal preferences [25]. However, this does not undermine the possibility of a decision paradox. It merely shows that one who has such an arrangement of preferences finds himself in a Newcomb-type dilemma.

It may also be worth noting that the agent believes Karl Rahner's assessment of anonymous Christianity is correct [26]. Accordingly, the agnostic decision-maker believes that, insofar as God exists, salvation does not require living the Christian life in the strict sense. The essence of anonymous Christianity, then, is that it is possible for someone to be indifferent in principle to Christianity, or even to God, and even to declare oneself explicitly an unbeliever, and, at the same time, to demonstrate by his conduct a fundamentally Christian sentiment, that is to say, to be considered an unaware Christian. Thus, the decision-maker believes it is possible to go to Purgatory as an anonymous semi-Christian if he does not commit mortal sins during his life and follows the main moral precepts of Christian teaching, but does not entirely abstain from worldly pleasures.

In order to see the agnostic person's Newcomb's dilemma, we must again represent the decision-maker's expected utilities according to a 2x2 matrix. Since the agent is agnostic, he has to calculate two possibilities: God exists, or He does not. Furthermore, he either lives a Christian life, or he does not. So the agnostic decision-maker reasons in the following way, 'if God exists, He knows

what conduct of life I am pursuing, will it be Christian or not'. Therefore, I have two options, either 'God predicts that I would live a life of faith and go to Heaven' or 'God predicted that I would live an unchristian life and go to Purgatory' only if He exists, that has 50% chance. Both of God's possible predictions about how the agent should conduct his life give him a reason for how to live his life. The decision-maker continues his argumentation in this way. If I live a believing life and there is a God, then the expected utility of living a life based on the statement 'God has predicted that I will live a believing life and go to Heaven' is (-50 + 1M) * 0.5 = 499,975. This is because minus fifty points - as defined earlier - is the burden of the Christian life, but Heaven brings one million happiness points, according to the agent. However, the maximum utility - happiness points - must be weighted by 0.5 since the agnostic person is only fifty percent sure of the truth of the prediction since that is the only certainty that God exists.

However, it is also a viable possibility that if I live a Christian life and there is no God, the expected utility of the life-guidance that follows from the statement 'God predicted that I would live a Christian life and go to Heaven' is (-50 + 0) * 0.5 = -25. This is the result of the fact that the burden of the Christian life (-50) is not outweighed by the happiness in Heaven. Again, the possibility of the prediction is being true is also fifty percent.

In the case where I do not live a Christian life, and there is a God, the expected utility of the prediction that 'God predicted that I would live a non-believer's life and go to Purgatory' is (100 - 200 + 1M) * 0.5 = 499,950. Since - as we have noted - the agnostic believes that worldly pleasures yield plus hundred points of happiness, but Purgatory comes twice as much pain (unhappy points) as mundane joys. The certainty of this outcome is again fifty percent.

Finally, If I do not live a life of faith and there is no God, then the expected utility of the life guidance that follows from the proposition 'God predicted that I would not live a life of faith and would go to Purgatory' is (100 + 0) * 0.5 = 50. And this result follows from the fact that in the absence of Heaven, the agent can only obtain happiness from worldly pleasures. However, the result is again weighted by 0.5 since the agnostic is unsure about the existence of God.

Note again that the decision-maker assesses the expected utilities mentioned above. So, these expected utilities are exclusive to the agent's preferences. Table 5 summarises the agent's decision matrix in terms of the expected utilities.

Suppose we accept the specific preference of the decision-maker, represented as cardinal preferences for ease of clarity and the characteristic of the agnostic person that God exists with only fifty percent probability. In that case, our fictional character faces a Newcomb dilemma.

According to the causal decision theory, we should choose the dominant strategy since the aggregate expected utilities for the non-Christian life total 500,000 happiness points (499,950 + 50) while the Christian life is rewarded with only 499,950 (499,975 - 25). On the other hand, as we have seen it, evidential decision theory suggests that the rational action is whichever available

one is the best evidence of what you want to happen. So, in terms of evidential decision theory, the Christian life should be chosen since it has a higher (499,975) expected utility than the non-believer (499,950). As we now can see, it is an apparent Newcomb-type dilemma since both approaches are equally rational.

Table 5. The payoff table of a theological Newcomb's dilemma.

The agnostic's choices	**GOD exists**	**GOD does not exist**
Agnostic does not live a Christian life	The expected utility of the prediction that 'God predicted that I would live a non-believer's life and go to Purgatory' is (100 - 200 + 1M) * 0.5 = 499,950	The expected utility of the life-guidance that follows from the proposition 'God predicted that I would not live a life of faith and would go to Purgatory' is (100 +0) * 0.5 = 50
Agnostic lives Christian life	The expected utility of living a life based on the statement 'God has predicted that I will live a believing life and go to Heaven' is (-50 + 1M) * 0.5 = 499,975	The expected utility of the life-guidance that follows from the statement 'God predicted that I would live a Christian life and go to Heaven' is (-50 + 0) * 0.5 = -25

The agnostic further argues for the believer's life as follows in accordance with EDT. If God exists, the fact that I live a faithful life would be the evidence for the truth of God's prediction. On the other hand, if God existed while I was not living a Christian life, my unbelief would also be evidence of God's existence. So whatever I do (if there is a God) will imply the validity of God's prediction. This is because if there is a God, everything I do is accompanied by God's prediction of how I will act. Therefore, if there is a God and I am living a Christian life (or not), God knows and has predicted it. So if God exists, the statement, for example, 'God has predicted that I will live a believing life and go to Heaven', is true. Furthermore, if God exists, any prediction in God's mind about my actions can be taken as evidence of God's existence. Naturally, this can be described in simpler terms: if God exists, God exists.

7. Conclusions

Since this possible conjunction between my actions and God's foreknowledge (and thus God's existence) has an extremely high utility, the very possibility of this conjunction - and the promise of the resulting possible utility (499,975) - is evidence to me of how I choose to act, according to EDT.

This is exactly what CDT denies. Causal decision theory says that my belief cannot cause God's prediction is being true: either God exists or not, I need to choose the dominant strategy resulting in higher expected utility.

Now we can see that the agnostic - with these preferences - is in deep trouble. There is no rationally optimal choice open for him.

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