E&HR

Offering Lottery Entry as an Incentive for Research Participation Compromises Informed Consent

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ABSTRACT This paper argues that offering entry into a lottery as an incentive to those who participate in research studies represents a challenge to the principle of informed, coercion-free consent that is considered an essential ingredient of permissible recruitment to studies. This is, first, because information about the chances of winning in this context is normally unavailable to potential participants and, without this, they cannot accurately weigh up the risks and potential benefits of participation. Second, even when this information is available, such an incentive capitalizes, I contend, on the difficulty of weighing up small probabilities, exploiting the fact that people tend to be beset by cognitive biases that make it challenging to make decisions rationally. The resulting conclusion is that we should not view lotteries as more ethical than simply paying participants, when the latter is feasible.

KEYWORDS lottery, prize draw, incentives, informed consent, human subjects research, research ethics

Jenkins, S. P., "Offering Lottery Entry as an Incentive for Research Participation Compromises Informed Consent," *Ethics & Human Research* 45, no. 3 (2023): 18-28, DOI: 10.1002/eahr.500165

Here, I argue that offering entry into a lottery as an incentive to those who participate in research studies contravenes the requirement to obtain informed consent. The principle of informed consent is considered an essential ingredient of permissible recruitment to studies, notwithstanding exceptional cases (for example, when the study can be performed only with participants who cannot consent). Researchers should provide greater justification for offering entry into a lottery than for offering a straight payment, rather than the reverse, and this should be reflected in the processes of gaining ethical approval from institutional review boards (IRBs) and research ethics committees (hereafter, I will use the term "IRB" to encompass both) for the conduct of research.

Much has been written on the ethical dimensions of offering incentives to people as a means of recruiting them as participants in research, with an emphasis on financial[1] incentives and as part of a more general discussion.[2] One such incentive, or type of incentive, is entry into a lottery, or prize draw. Most readers will be familiar with lotteries, since they are a common mechanism used by corporations to entice consumers into some action or other, such as providing feedback about a product or service. Entry into lotteries is now also common enough as an incentive for research participation. In contrast to situations in which research participants are given straightforward payments, a research participant who is entered into a lottery has a *chance*, rather than a *guarantee*, of getting a prize. Normally, when there is a lottery, the size of the prize is larger, for example, a larger amount of money, than a payment would be. It is my contention here that, in most cases, lotteries are even more unethical than straightforward payments, whether those payments are regarded as incentives or as compensation for lost time and/or earnings. This is because lotteries tend to involve a lack of information about a person's chances of winning and because, even

if researchers are upfront with this information, a person will reliably fail to accurately weigh low-probability events such as this in their assessment of whether to participate in a study. In cases where information is lacking, this is best conceived of as a failure to make adequate disclosures about elements of study participation that are materially important. In cases where these disclosures *are* made, informed consent is still absent, and this is best conceived of as a result of either the potential participant's lack of competence or lack of voluntariness for participation, arising from manipulation, or, under a more precise taxonomy, "reason-bypassing nonargumentative influence."[3]

The argument applies to any context in which lotteries are offered *as an incentive* for research participants. People may have all kinds of reasons motivating their decision to participate in research, including altruistic reasons concerning contributing to knowledge. However, I assume for this paper that there are at least some instances in which a lottery acts as an incentive, increasing the chance that a person will participate. I will also make the uncontroversial assumption that there are cases in which incentivization is at least part of the intention behind offering entry to the lottery. In theory, this can be distinguished from cases in which a payment is made or entry into a lottery is offered for some other reason, for example, to express gratitude for participation or to compensate for financial or time costs. In practice, however, knowledge of compensation may still act as an incentive (depending on its size). Since participants' motivations can be complex and multifaceted, it may not in reality be easy to identify cases where the payment or lottery entry is not operating as an incentive.

As I have said above, lottery incentives exist in market-research contexts as well as in medical ones. But since there are such stringent standards for medical research and such an emphasis on informed consent in this context, the natural place to situate this discussion is in the context of medical research (including related contexts like psychology research). We can reasonably expect contexts with higher standards to be more receptive to the charge that their practices are ethically questionable.

THE CONTEXT, HISTORY, AND PURPOSES OF THE CONSENT PROCESS

Informed consent is a flagship principle in modern Western medical ethics[4] and a cornerstone of the process of recruiting participants to research projects in a way that is deemed ethically permissible and legitimate.[5] Proposed research undertakings—from large clinical trials with hundreds of participants testing novel drugs and devices for safety and effectiveness to small-scale qualitative studies with small numbers of participants undergoing short interviews—are reviewed by IRBs, and one of the many reasons an IRB will scrutinize a potential project is to establish whether the proposed methods in the study conform to principles of informed consent. Specifically, an IRB will want to know whether sufficient information is provided, and in an appropriate way.

My hope is not to ban any study that proposes to incentivize participation using a lottery. It is to get the research community to recognize that lotteries do not represent a benign alternative to straight payments.

The bioethics literature is somewhat divided on the exact purpose of the process and practice of informed consent. Manson and O'Neill argue that the proper motivation for obtaining informed consent is to protect participants against abuse, misinformation, and coercion and that bioethicists and researchers should dispense with the concept of autonomy in questions of the role of informed consent.[6] Beauchamp, by contrast, argues that it is possible to maintain a positively framed notion of informed consent, whereby it facilitates and respects a person's autonomy rather than merely protecting them from certain harms or wrongs.[7] Those in step with Beauchamp's position will be satisfied that inadequate or improper informed consent processes are violations of autonomy; those following Manson and O'Neill will recognize that offering a lottery conflicts

with the goals of the informed consent process but will stop short of affirming that this has anything to do with autonomy. Whether the connection to autonomy is made or not, lotteries upset the apple cart, since to offer them is, in effect, to willfully convey misinformation to potential research participants.

The modern requirement for stringent processes of informed consent as an essential ingredient of permissible research can be traced back to the Nuremberg Code,[8] which arose as a response to the atrocities conducted in the Second World War. Some of these atrocities were dubbed "medical experiments," though the scientific robustness of most of them is in doubt.[9] At any rate, the fact that such things were perpetrated under the guise of medical experimentation that would benefit humanity fueled a desire to ensure that future experimentation would be conducted in accordance with ethical principles. It is clear that the victims of these atrocities were test subjects who were forced into the experiments, with no regard for their welfare and no concern for their volition or any desire to be in the experiment; no one would agree to participate in such experiments. The Nuremberg Code gave rise to the Declaration of Helsinki,[10] and now, in the twenty-first century, medical research takes place in the context of a variety of national and international guidelines. One example of the latter is the Council for International Organizations of Medical Sciences (CIOMS) guidelines.[11] This is a list of detailed guidelines for research ethics; at least two of these guidelines explicitly focus on informed consent.

As a result of all of this, today we have consent processes in research that are supposed to do at least two things: ensure that a person has enough information to make a proper choice about whether to participate and allow them to participate in a free and uncoerced way, without fear of harm or mistreatment if they decline to participate. It is my contention that offering entry into a lottery violates the first of these principles.

FINANCIAL MISCONCEPTIONS: THREATS TO INFORMED CONSENT

Difficulties and conundrums surrounding the provision of information to potential research participants are well documented in the literature, with topics ranging from philosophical questions about how much information is required for consent to count as truly informed[12] to more practical questions about the mode of information provision,[13] along with troubling findings about how little of the information participants actually read[14] and understand.[15] One thing that ought to be reasonably clear, however, is that the benefits of participation should not be exaggerated, either willfully or by accident. Part of the information that a person is supposed to receive about a potential study concerns the risks and potential benefits of participating. This is clearly a necessary component of the information so that a potential research participant can know what the purpose of the study is, what it stands to achieve, and what the possible downsides of participation are. These advantages and disadvantages could come in all kinds of forms, but the potential benefits should be described appropriately, without any overselling of the goods of study participation.

This overselling can occur in quite natural and accidental ways: infamously, the medicalized context may lead a potential participant to believe that the study is part of their health care. This *therapeutic misconception*[16] may be especially likely if the person is being recruited on the basis of their having a health condition that is being studied. Role confusion may play a part here too: throughout a patient's clinical encounters, they may see a string of different health care professionals, all of whom play slightly different roles that may not be clearly delineated for the patient. Another person coming into the mix, even if they clearly identify themselves as a researcher and not part of the medical team, may add to this confusion, and the patient may come to believe that the research project is part of their personal care, when, in fact, it may be designed, not to benefit them at all, but to confer benefit on others in the future.

It is not obvious that a lottery will evoke *therapeutic* misconceptions in study participants, especially those who are not recruited in their capacity as patients with a specific condition (e.g., a patient with diabetes participating in a trial about diabetes). However, the benefits of study participation that should not be oversold include financial as well as health benefits; a person's ability to make an informed decision about whether study participation is right for them depends on their having accurate information about the financial consequences as well as the health consequences. We may argue about

which is the more important, but that both factors matter is, I hope, uncontroversial. It is therefore the case that when a participant misunderstands the financial aspects of the study, this should also be viewed as a violation of the proper provision of information.

Although the therapeutic misconception may not result from the use of lotteries, financial misconceptions are also problematic. Since lotteries generate misconceptions about the financial incentives on offer, studies using lotteries violate the principle of recruiting participants only when those people are given accurate information about the benefits of participation. It may thus be tempting to characterize lotteries as a form of undue inducement to research participation. Naturally, the appropriateness of this characterization will depend on one's definition of the term "undue inducement." If we regard an undue inducement as any incentive with a morally problematic feature, then lotteries can be regarded as such. Under narrower definitions, such as that undue inducements are offers "so attractive that they lead individuals to participate in research studies to which they would normally have strong objections, based on risk or other important preferences,"[17] lotteries will not be undue inducements. A lottery incentive does not have to lead a person to contravene some important principle or value to count as a violation of informed consent, since the importance of the consent process is supposed to exist independently of considerations like this—the story goes that we must respect autonomy irrespective of the consequences of doing so or not. This may give us a reason to reject narrower definitions of the term such as the above so that "undue inducement" can capture both inducements that cause people to violate their own standards (as per Dickert and Grady's definition) and those inducements that, while not doing this, still bypass or confuse reasoning in a way that challenges proper informed consent.

Importantly, Dickert and Grady conclude that an incentive can be an undue inducement while at the same time being accepted rationally and with sound mind. The converse is also true: an incentive can be deemed *not* an undue inducement but at the same time constitute a violation of rational decision-making. My contention is that lottery incentives usually fall into the latter category.

Emanuel's definition is narrower still, as he argues that, for an incentive to be an undue inducement, it must be excessive, cause individuals to exercise bad judgment, and carry a "serious risk of harm."[18] For Emanuel, if the harm condition is not fulfilled, "there is just foolishness." Here, "foolishness" refers to the exercise of poor judgment, even in the absence of serious risk. Whether we agree with this definition of an undue inducement or not, the presence of this "foolishness"—the exercise of poor judgment—is significant for the purposes of informed consent. A financial misconception may lead a participant to shoulder an unacceptably high risk of harm, or it may not, but even where it does not, the foolishness matters a great deal in a context where participants are required to make autonomous decisions about what they do. An incentive may still be morally problematic even where a participant does not take huge risks, since the violation of consent is supposed to matter irrespective of those risks.

HOW LOTTERIES VIOLATE THE INFORMED CONSENT PROCESS

Lotteries threaten the provision of information in two main ways. The first of these is that, for the most part, the probability of winning is unknown, both to the participants and to the research team itself. The second is that, even with full information, the small probabilities involved trade on cognitive biases that prevent potential participants from rational decision-making.

A lack of available information. It is rarely the case that a person knows the chances of their winning a lottery when this incentive is offered in the realm of research participation. The mysteriousness of this probability can be a function of the way the lottery is administered. If the winner is simply a name picked randomly from all the participants who wanted to be included in the lottery, then to calculate the odds, the participant is left to guess (a) how many people will ultimately participate in the study and (b), of those people, how many will wish to be included in the lottery. If enrollment in the lottery is automatic upon participation, the answers to both these questions are the same.

How might a potential research participant go about finding this information? A shrewd individual may scrutinize the documentation describing the re-

search for sample sizes and such, but the vast majority of people will not do this, and even if they did, they would get only, at best, an approximation of their chance of winning, since it is never guaranteed that the desired number of participants, expressed in the sample size, will ultimately be recruited. Since lotteries like the state lotteries in the United States and The National Lottery in the United Kingdom are legally required to publish the chances of winning (albeit in small print only), and lotteries in the context of medical research rarely (if ever) make this information available (if it is indeed even known to the researchers themselves), then lotteries for research participants are in this regard even worse than state and national lotteries for failing to provide enough information for people to make decisions. Even the most intensely scrutinizing person would have to make guesses about the value of the incentive, because the information would simply not be available to them.

It is hard to see how a research study in which the chance of actually taking home the incentive is unknown, and could therefore range from one in two to infinitesimally small, can be seen as accurately and adequately describing the benefits of participation to potential participants. While there are analogous situations in which there is uncertainty about the likelihood that benefits of research participation will occur (for example, in clinical trials whose very aim is to establish the effectiveness of, say, a drug or in qualitative research where somewhat intangible benefits, like enjoying talking through issues, are proffered), there are two key differences here. First, a lottery is offered for the sole purpose of incentivizing participation, whereas in clinical trials or qualitative studies, the benefits are mentioned in passing as a potential side effect of the study. Second, in the case of lotteries, it is fully within the control of the research team to arrange the incentive so that there is more clarity and certainty about the chances that a given participant will actually get the prize. As an absolute minimum standard, then, I call for researchers to make more serious attempts to calculate, or fix, the probability of winning and to make this information available to people in advance, when they are only potential participants, to better help them decide on the value of this incentive. Possible consequences of this are that the lottery would be won by nobody or by more winners than the research team can afford to pay. In such cases, the research team should advertise the possibility of there being no winner upfront, when the lottery is described, to avoid complaints of foul play if this possibility is discovered later.

A lack of ability to process information. The preceding section described how lotteries for which the chance of winning are unknown violate the consent process since a person cannot hope to evaluate the benefits of participation without this information. Turning now to a second way in which lotteries threaten information provision, I claim that, ultimately, even when potential participants have full information about the relevant probabilities involved in a lottery, human cognition is such that these individuals cannot be said to have full information about the decision that they are making when they enroll in the study.

Let us consider the psychology at play among humans when they participate in gambling, including state and national lotteries. It is this parallel that will form the basis of the argument that lotteries in the research context inhibit rational decision-making.

It is well understood that human decision-makers are beset by several cognitive biases that can inhibit them from making rational decisions. Kahneman's *Thinking, Fast and Slow* is a seminal text on cognitive biases,[19] although it should be pointed out that some of the studies it reports have been criticized for irreproducibility.[20] "Rational decisions" in this context means something like decisions that cohere with each other and lead to the fulfillment of the agent's desires or of some other good, say, the advancement of the agent's interests, objectively conceived. There is much discussion in philosophy[21] and behavioral economics[22] about whether and how the above concepts amount to rationality, but for the purposes of this paper, there is no need to spend more time defining the term than this.

If we accept that willfully incurring a personal cost that is greater than what one can expect to gain is in itself an irrational decision, then, in most cases, the mere act of buying a lottery ticket is irrational in itself, since, in the majority of cases (though with rare exceptions),[23] the price of the ticket is higher than the expected value of winning (the size of the prize multiplied by the probability of winning it). The U.K. National Lottery and U.S. state lotteries both appear to operate with an expected value of around half the cost of a ticket, meaning

that, on average, for every dollar you spend on lottery tickets, you can expect to recoup fifty cents. Few people would accept a straight trade of a dollar for fifty cents (it would certainly be lucrative to know such a person), and it is similarly irrational to participate in lotteries whose tickets have expected values lower than the cost of entry; this is the same as handing over your dollar for a fifty-cent return, but with some extra steps in between that muddle one's decision-making.

There are several cognitive biases that lead to the specific irrational act of buying a lottery ticket, ranging from false beliefs to mathematical difficulties surrounding low-probability events. The latter type of bias is important here. Rogers suggests, "[R]ather than a complete ignorance of lottery probabilities, perhaps people simply misunderstand the true magnitude of lottery odds; that is [*sic*] just how small their chances of winning are. This is a strong possibility when one considers that odds of 14 million to one are likely to lie well outside the range of people's everyday experiences of probabilities."[24]

A sure loss of £2 in exchange for a 1-in-14-million chance of a jackpot win is not a calculation that can be comprehended easily by a human brain. So even when a person is made aware of their chances of winning, this probability is so extraordinarily tiny that they cannot properly evaluate it so as to make a rational judgment about whether buying a ticket is a good bet. We know from empirical literature that people overweight small probabilities; in other words, they act as if low-probability events are more likely than they are in reality.[25] Returning to the parallel between therapeutic misconceptions and financial misconceptions, we also know that this problem is particularly exacerbated in more emotional, "high-affect" scenarios (e.g., relating to health) compared with lower-affect scenarios (e.g., those pertaining to money). The problem nevertheless persists across both domains, so while the research ethics community may be right to have focused its efforts on combating the therapeutic misconception, it is now time to stop ignoring the financial misconceptions that are willfully capitalized upon by offering lotteries as incentives for research participation.

The problem of poor judgment is even considered explicitly in the CIOMS guidelines: "Compensation must not be so large as to induce potential participants to consent to participate in the research against their better judgment."[26] This shows that the international research ethics community is sensitive to the fact that human judgment about whether to participate in studies is corruptible, though their focus is on inordinately large payments rather than prizes with inordinately small chances of being won.

Even if it is the case that "[t]here are no data that payment leads to poor comprehension, or that high inducements make comprehension even worse,"[27] we know that it is hard to make rational judgments about low-probability events. Thus, while the CIOMS guidelines show a recognition of the problem of human fallibility, they fall short of appreciating that it applies to lotteries as much as to large amounts of money, if it even applies to the latter at all. Where we are concerned with consent and autonomy, then, lotteries should therefore be the target of our criticism in the research ethics domain, insofar as probabilities are more difficult for people to comprehend than are large amounts of money.

OBJECTIONS TO THE GAMBLING COMPARISON

Participants benefit from enjoying a pleasant dream.

It might be argued that entering a lottery outside the realm of medical research, such as a state or national lottery, is different from engaging in a straight trade, since there is more at stake in the former than solely the financial aspects of the game. Even if the expected value of a lottery-ticket purchase is negative, in buying a ticket, one buys for oneself the legitimacy of having enjoyable fantasies of winning the big jackpot: "it is the right to dream pleasantly of winning."[28] A dollar sitting in my bank account was always going to be only a dollar—maybe a little more with interest, or more still if I invest it sensibly. But a dollar "invested" in a lottery ticket has a chance—albeit slim—of transforming my life into one of vast wealth and increased privilege. The argument (which I will call "the pleasant-dream argument") goes, then, that buying a lottery ticket is therefore no different from other forms of rational (or, at least, not *ir*rational) indulgence in irrationality, like suspending disbelief to enjoy a fictional book or film.

Notwithstanding the difficult questions about how to evaluate the romanticism of dreaming of lottery wins and whether such rational irrationality is a coherent concept, this objection is not really one that applies to the medical research-related lotteries example, since

the value of a win in these lotteries is usually so much smaller than a lottery win in the nonresearch context. It is one thing to argue that it is legitimate for people to rationally choose to indulge the irrational parts of their mind by buying into a scheme that, although ultimately costly to them, allows them to fantasize about being filthy rich. But it is highly doubtful that anyone has ever reaped similar pleasures from imagining themselves winning a £50 Amazon voucher. Furthermore, even if they did, it would be ethically questionable to promote such irrational indulgences in the context of decisions about whether to participate in a research study. Researchers offering a lottery would indeed be trading on people's irrationality; yes, participants who opt into the lottery could get something out of it by being able to have mild fantasies about what they might do with a modest cash prize, but IRBs and bioethicists are unlikely to be satisfied that those fantasies are a benefit that justifies circumventing participants' rationality. So, it does not seem like the pleasant-dream argument for lotteries transfers comfortably to the research ethics context.

Lotteries in the research context are easier to win than state or national lotteries. A more serious objection to my argument is that the probability of winning is much greater in research-related lotteries than in lotteries like those run by states and countries, so that the 1-in-14-million chances of the sort described by Rogers, which are so challenging for human minds to comprehend, are not really relevant. This is likely to be so. As I have said, empirical literature tells us that we overweight small probabilities, of which 1 in 14 million must surely be an example. It also tells us that we *under*weight medium and large probabilities, failing to account for the true expected value of things that are likely to happen, or roughly as likely to happen as not. If participants are underweighting the probability of winning a lottery, then the problem is not that they are being duped into participating in studies by thinking they will win something that they are very unlikely to win, but actually that the benefits of participation are underrepresented to them in their own thinking. This is much less obviously an ethical issue from the perspective of normal autonomy-focused research ethics (though underrecruitment to studies resulting from failure to promote the study's benefits would be a more serious problem from a consequentialist perspective, which would be more concerned with the benefits missed as a result of suboptimal science).

It is obviously the case that the chance of winning a lottery after participating in a research study is greater than 1 in 14 million. It is also probably obvious to most people, whether they know the odds of a lottery win or not, that the chance of winning a research-related lottery is much higher than that of winning the non-research-related lottery. Nevertheless, the chance of winning is still low enough to render a person unable to weigh the low chance against the value of the prize and come up with a rational decision about whether to participate. Indeed, Gonzalez and Wu describe probabilities of 5% and 10% as "small"[29] in their discussion of people's tendency to overweight small probabilities. So, while a 1-in-14-million lottery win serves as a dramatic example, it seems the chances do not need to be anywhere near this low for our biases to be triggered in a way that interferes with true, reasoned, and autonomous decision-making. Since most lotteries for research are likely to offer a participant less than a 1-in-20 chance of taking home the voucher, I contend that even though the effect is smaller, lotteries are not conducive to fully informed decision-making due to the same biases that beset players of state and national lotteries.

The cost of research participation is low. A putative justification of national lotteries and such is that the cost of playing—the bet—is small. A similar argument might then be made that worrying about incentives for low-risk research does not matter a great deal, since in these cases the costs of participating are extremely low. However, as Rogers points out, these costs accrue over time, and the cost of a lottery ticket influences a person's decision whether to buy one, showing that these costs matter to people.[30] The costs of research participation may be larger than the costs of entering a national or state lottery, depending on how people value trade-offs between time and money. Suffice it to say that the research community already agrees that the time spent participating is enough of a cost that it is one of the reasons that scrutiny of research studies with human participants is warranted; indeed, even if participating presents no concern that participants will become distressed or have their privacy violated by data leaks (concerns that may be absent with, for example, anonymous

surveys), members of the research community still think it matters that people spend time participating, and the research community makes considerable effort to ensure that this time is not wasted. It will, then, not be appropriate to just write this cost off as morally irrelevant or unimportant. If the research ethics community wishes to make that argument, they would need to accept that some of their review practices are overbearing and unnecessary.

THE "PROBABILITY MISCONCEPTION": A DELIBERATE EFFECT?

I earlier made a distinction between willful and accidental misleading of research participants with regard to the possible benefits of study participation. Insofar as the rationale for offering a lottery instead of straight payments is that the lottery is known to be cheaper for the research team to administer, the use of a lottery is willfully misleading, since, with it, the research team trades on the knowledge that it can cut the costs of conducting research without reducing the numbers of participants to an unacceptable level. If the study population were expected to be entirely rational, it would make no sense to offer a lottery instead of a straight payment: members of a rational population would be expected to correctly calculate the expected value of participation and reduce their willingness to participate accordingly. The fact that a lottery works out to be cost effective for the research team and that research teams may opt for a lottery option for that very reason suggests that the team knows, on some level, that they are dealing with an irrational population. They are then trading on that irrationality as a means of maintaining acceptable recruitment levels while cutting costs. The very fact that a lottery for research participants is cheap to administer shows it to be ethically questionable.

This is not to say that the researchers and IRB members who propose lotteries are really so calculating. A culture of offering lotteries has emerged in this context, presumably because offering someone only a chance of winning the prize seems less gauche than just giving them a payment. Individual researchers and even IRB members who conform with this culture should not be considered blameworthy for so doing. But it is time that the research community reconsidered this practice.

It may be thought that exploiting this irrationality in this way is acceptable given the vast benefits that can be gained from people's participation in research. This consequentialist reasoning is important, and it is likely that bioethicists, researchers, and IRB members discount these benefits unreasonably in our ethical analyses of putative research. Nevertheless, there are good reasons to be honest about what we are doing, and there are good consequentialist reasons to do so, as well as reasons from the other moral theories.

IMPLICATIONS

It is worth a note about what I hope the result of this paper will be. Since I am sympathetic to complaints that standards of consent and other purportedly autonomy-preserving measures may have become unnecessarily stringent, I would be unhappy to add yet another string to the IRB's bow in terms of ways they can reject a proposal for good, benefit-conferring research. The same cognitive biases that I have highlighted in this paper to rail against lotteries are likely at play in the decision-making processes of IRBs, in that IRBs are likely to give disproportionate weight to immediate, more-definite consequences (e.g., harms to participants) over the nebulous, future, positive consequences of great research. So, my hope is not to ban any study that proposes to incentivize participation using a lottery. It is just to get the research community to recognize that lotteries do not represent the benign alternative to straight payments that they may often be thought to. A desirable consequence of recognizing this may be to be more permissive when it comes to paying participants, rather than more restrictive in terms of how research teams incentivize research participation. I therefore implore any IRB members who may be convinced by the arguments here *not* to reject a study or ask for revisions on the basis of its proposing a lottery incentive scheme. Instead, my suggestion to them is just to refrain from proposing a lottery as an ethical alternative to straight payment in a context where the research team can afford to pay participants and there are no serious opportunity costs. Similarly, anyone reading this paper who applies to an IRB to conduct research might now feel emboldened to offer a direct payment to their participants instead of offering entry into a lottery; and if

their colleagues or the IRB suggest a lottery instead, the arguments in this paper can be relayed to them.

This paper has focused on financial lottery incentives and has made efforts to express that researchers, IRB members, and research ethicists should care about the accurate provision (and participant understanding) of financial incentives as well as medical incentives. But the above discussion about cognitive biases and small probabilities raises altogether more troubling questions when applied to the question of a study's *risks*. I have shown that small probabilities of winning lotteries are not something that a person can easily and rationally include in their calculations about whether to participate in a study. But participating in a study is not always just a matter of deciding whether nebulous probabilities of earning some money are worth minor costs such as time and effort. In clinical research, sometimes the incentives are fixed (e.g., a stated amount of money given in payment or compensation), and it is the costs, not the rewards, that are probabilistic and vague.

For example, a study may compensate a person a few thousand dollars for taking an experimental drug to assess its safety and tolerability. In these cases, drugs will have undergone animal testing. They may also have undergone prior human testing before a dose is given to the participant in question, but this cannot always be the case—some human or other must be the first person to try the drug. In these cases, there are always low-probability outcomes that can be extremely harmful to a research participant. In the same way that a person is unable to weigh up the chances of winning a lottery, a person cannot suitably weigh up the low chances of some unpleasant medical side effects as results of their participation in the study. Therefore, the argument I have presented not only raises questions about the ethical permissibility of offering lottery incentives; it also questions the ethical permissibility of the gamble that is participating in risky research.

While I accept that the same ethical problem applies, I have focused this discussion on lotteries for the simple reason that there are easier solutions in this domain than in the wider field of clinical research involving risks to participants. It is not obvious that there is any way to reduce those latter risks any further, although there may be further work that can be done to structure the choice landscape differently to facilitate decision-making, once we recognize the true force of people's difficulty in making judgments about low-risk events. However, in the case of lotteries, a researcher or IRB member commits an error if they presume that a lottery is more ethical than a straight payment, and it should not take much for anyone who makes this mistake to correct their approach to study design and to the provision of information to potential research participants. Hence, while the affronts to participant autonomy are the same in both cases, there are relatively easy wins in the context of studies offering lottery incentives.

SUMMARY AND PROPOSALS

I have made the case that we should avoid the temptation to regard offering lottery entries as more ethical than offering direct payments when these methods are used as incentives for research. What follows are two short sets of considerations that members of the research community can use to help determine the appropriateness of the incentive mechanism being proposed in a given situation. They can be used by IRB members, researchers themselves making proposals, and, indeed, potential funders reviewing proposals, who may ultimately need to take some responsibility for footing the bill for what is a more expensive (yet more ethically robust) method of recruiting participants. These considerations must fit into wider discussions about the appropriateness of the wider recruitment picture, with due regard to the appropriateness of the choice landscape that is presented to the potential participant. They should thus be considered as slotting in after a decision to provide an incentive to participants has been made:

- Are sufficient resources available to provide (sufficiently large and appropriately incentivizing) direct payments to recipients? Could these resources be acquired or provided? If so, are the opportunity costs of using them for this purpose acceptable?

- If resources for direct payments are not available and a lottery is therefore under consideration, does the documentation about the study give an indication of the chances of winning the lottery? If the chance of winning is unknown, is there a way to fix that chance so that it can be known and then expressed to participants?

CONCLUSION

I have made the case that offering entry into a lottery as an incentive for participation in research is a violation of the informed consent process. The reason for this is twofold: first, information about the chances of winning is not forthcoming; and second, even if that information is available, the cognitive difficulties and biases associated with weighing such low-probability events render informed consent challenging, if not impossible, in such cases.

The mechanism by which entry into a lottery operates as an incentive to participate in research is one that takes advantage of plausible cognitive biases, and natural human difficulties in processing and weighing information about low-probability events make the incentive more complex and less straightforward than a payment. In the worst cases, the probability of winning is not even disclosed to the participant, making the actual expected value of participating very nebulous and secretive to the potential participant, who either must make a guess at the probability of winning or, in more likely cases, will participate without even considering this. This makes the incentive dishonest and deceptive.

Since lotteries can be cheaper to administer, there may be cases where a lottery is the only possible financial incentive (short of spreading out a small amount of money around to everyone, which will not have much effect as an incentive), with the alternative being not to run the research project at all. Smaller projects with limited or no funding will be examples of this; sometimes, payments for all participants are just not possible. Where this is the case, I suggest that lotteries can still be permitted based on the importance of conducting the research. In such cases, the autonomy-threatening features of lotteries can be mitigated, even if not totally eradicated, by providing information to participants about the probability of winning. Those of us who are researchers, IRB members, or funders of clinical studies must accept, however, that, in such cases, we are capitalizing on human ignorance and the propensity to suffer from cognitive biases, in order to get the research done. Insofar as autonomy is an important principle in research ethics, we should accept that where we are offering lotteries, we are, at least to an extent, compromising autonomy in order to reap the rewards of the research. ♦

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ACKNOWLEDGMENT

I would like to extend my thanks to Greg Moorlock, PhD, for his helpful comments on an early draft of this paper.

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