Title

Evidence from 33 countries challenges the assumption of unlimited wants

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Abstract

Humans have unlimited wants. This foundational economic principle and widely accepted assumption about human nature poses considerable challenges for addressing sustainability because pursuing wealth and economic growth to meet unlimited wants increases resource use and pollution. Here we show evidence that this principle is not universal, and actually applies only to a minority of people. Across 42 community samples (N=7860) from 33 countries spanning 6 continents, we examined how much money people wanted in their absolutely ideal life. In 86% of countries the majority of people thought they would achieve their absolutely ideal lives with US$10 million or less, and in some countries as little as US$1 million or less. However, a substantial minority (8-39% across countries) wanted as much money as they could obtain, indicating unlimited wants. Limited and unlimited wealth ideals were not related to country differences in economic development, but those with unlimited wants tended to be younger, city- dwelling, valued power, success, and independence, and lived in countries with a greater collective focus and acceptance of power differences. The results suggest that transformative approaches relying on limiting wealth and growth to achieve sustainability may be more consistent with human ideals and aspirations than commonly believed.

Main text

Introduction

The truism that people have unlimited wants has been proposed since ancient Greece[1] and persists today in economics textbooks as a basis for the basic economic problem of scarcity – how to optimally satisfy unlimited economic wants given limited economic resources (textbook examples are in Supplementary Materials, Table S1).

This truism also underpins a basic sustainability problem. The unrelenting pursuit to satisfy more of our unlimited wants means continually increasing wealth, which in aggregate means pursuing continual economic growth. Yet this is detrimental to sustainability as wealth increases resource use and pollution[2], and we have not yet found effective ways to decouple economic growth from damaging environmental impacts[3-5]. In essence, our insatiable economic desires pit human nature against achieving sustainability. This truism can also influence policy by restricting perceptions of feasible sustainability policies (e.g. on climate change) to those that promote economic growth ("green growth"), even though decoupling energy production from economic growth is unlikely to reduce emissions sufficiently in the short timeframe needed to avert damaging climate change[5].

But what if the truism of unlimited wants was not true? If many people had *limited* wants, this would change the nature of the basic sustainability problem. Sustainability would no longer be inherently at odds with human nature, and attention could turn to what leads people to have different levels of wants, and how we might help others achieve their ideal economic lives in more sustainable ways. While having limited wants does not solve the sustainability problem itself, it makes it at least possible in principle for people to achieve their economic ideals within sustainable resource limits.

We first aim to clarify the theoretical basis of unlimited wants and propose a way to test its key prediction. The most logically consistent way to think about unlimited wants is as "*infinite wants*" – desiring *all* possible economic goods. But this is unlikely both logically (every economic exchange means transferring resources so they cannot all be owned by one person) and psychologically (that people's starting point for thinking about their wants is infinity). Instead, most economic approaches focus on what could be called "*insatiable wants*" – from the starting point of their present life people cannot conceive of a point where their wants would be fully satiated so they will always aspire to accumulate more/better economic goods. Taken to its logical conclusion insatiable wants are the same as infinite wants (with some equating them[6]), but psychologically it starts from the more plausible point of people extrapolating from their present lives.

It is important to distinguish insatiable wants from two other concepts. "*Sustenance wants*" come closest to being unlimited as a truism because the way they are consumed means they can never be fully satiated during our lives. No matter how much fresh food we eat today we will want fresh food in the future, although the amount can be stable over time. Other goods we use to live, such as clothing and shelter, decay over time and require ongoing resources for maintenance, repair, or replacement. However, unlike insatiable wants they do not require accumulation. Finally, "*imaginings*" refer to being able to imagine owning economic goods without this being a meaningful aspiration or desire. It is possible for people to imagine owning all the real estate in Manhattan, or even the world, but while some would find that desirable (a "want") for others it would not be a want as they have no genuine aspiration or interest in achieving this.

Here we focus on "*insatiable wants*" because it is the most widely-used and defensible construal of unlimited wants, and because of its consequences for sustainability through requiring accumulation and economic growth and hence increasing use of material resources. While it might seem impossible to measure insatiable wants, if at least some people's wants are limited then their wants are measurable, and this can distinguish those with limited and

unlimited wants. Moreover, insatiable wants generates a clear prediction, including in situations with limited economic resources – people should desire the maximum economic resources possible to satisfy as many of their economic wants as possible.

In modern societies, wanting unlimited money is a reasonable proxy for having insatiable economic wants. Money cannot satisfy every want, but having more money allows us to obtain more or better goods and services, is a source of self-sufficiency and independence, and meets symbolic wants such as social status and our capacity for altruism[7-10]. Accordingly, a preference for more money over less in equivalent circumstances has been treated as a self-evident truth [11]. Other things being equal, if people have insatiable economic wants they should desire as much money as possible to satisfy as many of their insatiable wants as they can.

Yet the idea that people could have limited wants has rarely been seriously considered. This may be related to exposure to high-profile media examples of ultra-wealthy people whose continued pursuit of wealth indicates insatiable wants. If even the ultra-wealthy cannot fully satisfy their wants, then surely it applies to everyone else. But while modest economic aspirations seem less newsworthy, accounts of people who appear satisfied with few material resources and do not desire accumulation sometimes emerge[12].

Empirical research in related areas also give some reasons to doubt this truism. Most people express relatively moderate ideals for other seemingly universally positive things such as freedom, happiness, and health, with only a minority wanting to be completely free, happy, or healthy [13]. People also vary in whether they think desiring wealth is part of human nature [14]. Income beyond a moderate level has less impact on people's wellbeing, with some finding a decreasing rate of positive impact [15], no increase in wellbeing (albeit with cultural variation) [16,17], or even a decline in wellbeing at very high incomes [18]. While greater wealth increases consumption choices, greater choice does not always increase satisfaction [19]. While these examples have not measured the extent of economic wants, these findings suggest that having greater wealth may not necessarily be seen positively.

As "want" is a psychological construct, perhaps the closest we can get to a direct measure of insatiable wants is to ask how much money people want in their absolutely ideal life that would satisfy their wants. But we need to carefully consider the source of such wealth. We could ask for their ideal income, but higher incomes typically involve trade-offs with responsibilities, risks, time, or ethicality, which is likely to lead people to report lower ideal wealth as they consider these costs. Wealth through philanthropy or inheritance is likely to come with implicit expectations from the giver. Such issues can be minimized if people could obtain wealth purely by chance, such as a lottery, and for most people a lottery is the most psychologically feasible route to massive wealth – it should be easier for people to contemplate gaining wealth through a lottery than through discovering an ultra-wealthy relative or benefactor.

Hence, we developed an "absolutely ideal life" lottery measure (Box 1) to assess the extent of people's economic wants. We note that using a lottery was not intended as a proxy measure for behaviour, but to measure the psychological construct of wants in a way that minimizes perceptions of trade-offs that could reduce reported wealth ideals. Participants were asked to imagine their absolutely ideal life, and then consider how much money they wanted in that life. They then made a choice of their preferred prize in a hypothetical lottery for the amount

they wanted in their absolutely ideal life. Amounts varied by a magnitude of 10 from ten thousand US dollars to 100 billion US dollars (USD) in local currency. We emphasized that each lottery had identical odds of winning to address expectations that larger prizes have lower odds. If people have insatiable wants they should choose the maximum USD100 billion (we call people making this choice "Unlimiteds") over all lesser amounts ("Limiteds").

We collected data in two cross-cultural community samples who participated anonymously (sample and country details in Supplementary Information, Tables S2 and S3). Study 1 sampled twelve countries (N=2112). Study 2 obtained more representative samples from thirty countries (N=5748), increasing spread across regions and levels of economic development to increase generalizability.

Results and Discussion

Findings were remarkably similar across studies (Box 1). Lottery selection was bimodal, peaking between 1 and 10 million, dropping to only a few selecting 1 or 10 billion, and peaking again at 100 billion, suggesting a clear distinction between Limiteds and Unlimiteds. In Study 1 the proportion of Unlimiteds was highest in the USA (32%) and lowest in China (8%); in Study 2 Indonesia had the highest proportion of Unlimiteds (39%) with the lowest in Russia (11%). Overall, people with unlimited wants were identified but they were always a minority.

Even though some limited wants may exceed sustainable resource use, finding that people vary in their economic wants allows us to consider cultural and social influences associated with more moderate economic wants, to help understand how people's ideal lives could become more consistent with sustainable resource use. To explain why Unlimiteds were more typical in some countries, we correlated the percentage of Unlimiteds in each country with indicators of development (Human Development Index, GDP per capita, GINI inequality index) and dimensions of culture using Hofstede's cultural model [20] (descriptions of dimensions and values uses are in Supplementary Information Section S2.4, and results in Section S4.2). The proportion of Unlimiteds was similar in more/less developed countries, which is especially notable given how the pursuit of luxury and consumption is supported by economic and political institutions in developed countries[21]. Although there was variation across studies, overall Unlimiteds tended to be more prevalent in countries with cultures that prioritize the group over the self ("Collectivism", more typical in East Asia and South America), and in countries with greater acceptance of inequality ("Power Distance").

Information about participants' demographics and values also helped us understand differences between Limiteds and Unlimiteds, with meta-analyses used to identify overall patterns and variation across countries (details in Supplementary Information Section S4.3). Younger people were more likely to be Unlimited, but with significant country variation – this age effect was stronger in countries higher on the Human Development Index, and in countries where equality was emphasized (low "Power Distance")[20]. Unlimiteds were more likely to live in cities, but Unlimiteds and Limiteds did not differ by gender, social class, education, political orientation, or the time taken to make their lottery decision.

There was conflicting evidence about whether Unlimiteds would use wealth more altruistically. The higher prevalence of Unlimiteds in more collectivistic countries indirectly suggests Unlimiteds had a greater focus on group welfare. More directly, when participants

described the main change they would make with the prize (see Supplementary Information Section S4.4), Unlimiteds were more likely to mention addressing broader social/world problems (although the majority of both Unlimiteds and Limiteds still intended to use it exclusively for themselves and their family/friends). However, when rating their values[22], Unlimiteds were no more likely than Limiteds to value others' welfare (Self-Transcendence values), but did place higher importance than Limiteds on their personal outcomes and interests (Self-Enhancement and Openness to Change values). Further research is needed to reconcile these findings, including whether people express altruism strategically to justify wanting extreme wealth.

This extensive cross-cultural evidence does not support the truism of insatiable wants, although having insatiable wants does describe a substantial minority of people. Most participants reported they could achieve their absolutely ideal life with between 1 and 10 million US dollars, which can be seen as rich (especially in poorer countries) but by Western standards is not extravagantly wealthy. In some areas of London or New York USD1 million would fail to buy the average house (www.bloomberg.com/graphics/property-prices/nyc/; https://data.london.gov.uk/dataset/average-house-prices), and USD10 million is substantially less than the USD14-17 million *annual* salaries of CEOs of the largest 350 US firms[23]. Considered across a lifetime these amounts even seem modest. At the median of $1 million identified in many countries, for a person of average age in a Western country (about 38) with a lifespan of 78 (hence a 40 year period), this is $25,000 per year – lower than the median income in many Western countries. Instead, wealth aspirations seem more consistent with Aristotle's conception of virtue as a moderate state between deficiency and excess[24], often described as the "golden mean", in this case reflecting aspiring to comfortable but not extravagant.

The design of the lottery measure where wealth would be obtained by chance means the findings are not readily attributable to "satisficing" – adjusting aspirations according to the extra time or resources needed to achieve better outcomes[25]. Instead, most people reported moderate wealth ideals even if greater wealth could be achieved in identical circumstances.

However, we acknowledge several factors that may have influenced lottery selection. Although participation was anonymous to reduce socially desirable responding, some people may have reported more limited wants to avoid being seen as greedy. However, only two participants mentioned greed, greedy, or selfish in text responses, and we note that a higher lottery prize allows for greater generosity through distributing wealth to others (as some people indicated). Moreover, social desirability could contribute to reporting *unlimited* lottery choices. Wealth is a marker of prestige and success[26], so some people may choose the maximum because they think it is a normative expectation to desire maximal wealth as a sign of success. So while socially desirable responding may have occurred (in both directions), it is unlikely to influence responses only for Limiteds, nor account for all Limiteds' responses.

Another possible influence is when people imputed expected values. The lottery measure directed people to focus on the prize amount rather than the odds of winning, so odds were not specified. However, some people may have acted like rational economists and imputed estimated odds of winning to derive an expected value (e.g., a person wanting $1 million may have imputed odds of 1:10,000 and chosen the $10 billion lottery). We note that this would only strengthen the case that most people have limited wants as it would mean people

choosing a lottery prize higher than their ideal, so some who chose $100 billion may have much more modest economic ideals. But this approach was probably uncommon because any reasonable odds of winning even a moderate amount like $1 million would involve selecting lotteries in the billions, and these options were less frequently chosen than lower prizes. While the lotteries chosen indicates that most people focused more on the amount than the specific odds/expected values, imputing expected values would contribute additional variability in responses and future research could investigate the impact of odds on lottery choices.

A further possible influence could be experience with lotteries. In some countries lotteries are more popular, which may affect familiarity with the task. Correlating the proportion of Unlimiteds in a country with the existence and popularity of lottery sales (the latter expressed as a proportion of country GDP)[27] showed no significant correlations with Unlimited lottery choices (Supplementary Information, Table S6). Although this suggests lottery familiarity is unlikely to strongly influence the choice of the Limited/Unlimited prize, we did not measure personal experience or use of lotteries so individual-level influences could still be examined.

We also acknowledge that the wants reflected in people's lottery choices can change over time, although it should not be assumed that aspirations can only increase as people approach or even achieve their economic ideals. People who appreciate positive changes in their lives tend not to increase their aspirations[28], and for many people wealth makes no appreciable difference to their happiness[16,18]. While people typically overestimate the positive impact of positive events on their wellbeing[29], if they come to realise their quest to satisfy all their wants will not make them happier and they appreciate the progress they have made, their economic wants for their ideal lives could remain stable or even reduce. This applies to both Limiteds and Unlimiteds, although it may be more challenging to convince Unlimiteds to appreciate gains because these may always appear insignificant relative to their unlimited ideals.

We are just at the beginning of understanding why people differ in their wants. Beyond the demographic, cultural, and stable individual differences examined here, attention to how people think about wants themselves is warranted. Here it will be important to distinguish *contributing factors* (involved in deciding our wants) and *constraining factors* (that make achieving our wants more difficult). Contributing factors would include people's judgements about what goods will make them optimally happy, but also downsides such as believing extreme wealth creates social division and conflict. A person's ideal level of wealth is an outcome of these considerations – if someone chooses limited wealth after considering the impact of wealth (positive and negative) on themselves and society, this represents their genuine aspiration. In contrast, constraining factors do not affect ideals but provide reality constraints on their achievement, such as someone believing they lack the skills or power to achieve their desired wealth. Asking about people's absolutely ideal life is important to minimise constraining factors. If people express limited wants even in their absolutely ideal life, it is difficult to imagine why they would have unlimited wants after factoring in practical constraints to achieving them.

Although this research focused on the basic question of people's wants, the findings provide insights for progress towards sustainable societies. These findings can help change our normative beliefs about human nature. Normative beliefs guide behaviour even when they are

inaccurate, in part because people experience what psychologists call "pluralistic ignorance" [30] where people refrain from acting on their personal views because they mistakenly believe the majority think otherwise. People need to be reassured that their limited wants are normal, especially as people are constantly exposed to advertising relentlessly prodding them to consume more.

Greater social recognition and acceptance of limited wants allows a shift in focus to what can we learn and emulate from people with more limited economic wants, to help others to adopt ideals within the limits of sustainable resource use. Rather than assuming human nature makes economic ideals an ever-receding target, we can consider how to shift people's economic targets closer – helping them achieve their ideal lives within sustainable boundaries, with sustainability a contributing factor to people's ideals rather than just a constraining factor. While committed Unlimiteds may always desire more, some Unlimited and Limiteds may be open to changing contexts and conceptions of the "good life" that may be critical for living sustainably[31,32].

With shifts in people towards more limited economic ideals, along with emerging priority for other goals for living such a community wellbeing, comes opportunities for revisiting governmental policy priorities, especially the need for perpetual economic growth[33-35]. Future research could examine more specific policy responses such as endorsement of wealth taxes that have been proposed to fund sustainability initiatives [36] (www.warren.senate.gov/newsroom/press-releases/warren-jayapal-boyle-introduce-ultra-millionaire-tax-on-fortunes-over-50-million), as wealth taxes of $10 million or more would have no impact on the ability of most people to achieve their absolutely ideal economic lives.

However, shifting people towards more limited wants is not straightforward. It might seem intuitive to encourage limited wants through promoting the welfare of others or society as a whole[6], but Limiteds were no more likely to value "pro-social" outcomes for others and the world (Self-transcendence values), and at a country level valuing group welfare was associated with countries having *more* Unlimiteds. Nor does it appear that Limited wants will become more common as a result of economic development leading to more "post-materialistic" wealth aspirations. While economic development (GDP) impacts post-materialistic values in terms of valuing self-fulfillment over survival[37], it was not strongly related to people's aspirations for unlimited wealth, and evidence using a broader index of human development (Human Development Index) also failed to show robust associations with Limited/Unlimited wealth aspirations.

Given these complexities, alternative strategies could focus not on wants but the values fulfilled by aspiring to unlimited wealth, including achievement, success, and power. A supplementary analysis examining variation in Limiteds' responses showed similar associations to explain those who chose larger limited prizes (Supplementary Information, Section S5), indicating that similar values underlie both large and unlimited wealth aspirations. This provides a policy and communication challenge to better align these values with sustainability. Alternatives to wealth for fulfilling these values exist, such as success and status achieved through contributing to community wellbeing [33,35]. Progress has already been made in developing transitional paths that allow people to pursue these values in environmentally sustainable ways[33]. Even for Unlimiteds who retain a desire for unlimited wealth, opportunities for wealth in "green growth" may motivate them to achieve wealth

through more sustainable innovations and help society make at least some progress towards sustainability. Hence, a combination of reducing the overall rate of economic growth while aligning economic development with “green growth” may provide a strategy for sustainability that is acceptable to both Limiteds and Unlimiteds.

Overall, these results suggest that it is neither universal nor normative to want to accumulate more and better economic goods without end (insatiable wants). Yet opportunities for promoting sustainability will be missed if academics and others making and influencing policy erroneously believe that we all have insatiable wants. The idea that people could achieve their ideal economic lifestyles within sustainable resource limits may be more achievable than commonly assumed.

Methods

Additional details of methods and measures are contained in Supplementary Information Section S2.

Ethical Approvals

Both studies received ethical approval (Study 1: Queensland University of Technology, Approval Number 1600000223; Study 2: University of Queensland, Approval Number 2018001124), and studies complied with ethical regulations.

Participants and data collection

In both studies participants were recruited through commercial survey companies and completed the measures online.

Study 1 (aiming for n=220 per country) obtained samples from the general community to to span advanced and economically developing ("BRICS") countries and continents: USA (North America); Brazil, Argentina (South America); China, India, South Korea (Asia); Russia, Sweden, United Kingdom, France (Europe); South Africa (Africa); and Australia (Oceania).

Study 2 (aiming for n=200 per country) used more stringent sampling criteria to achieve country representativeness for age and gender, and we focused on obtaining a broader range of economic development and representativeness across world regions including countries/regions rarely used in psychological research including Saudi Arabia, United Arab Emirates (Middle East); Kenya, Uganda, Tunisia, Morocco (Africa); and Nicaragua (Central America). Other countries sampled were USA, Canada, Mexico (North America); Brazil Chile, Colombia (South America); China, India, Indonesia, Japan, Philippines, Singapore, Vietnam (Asia); Russia, Sweden, United Kingdom, Hungary, Spain, Greece, Ukraine (Europe); South Africa (Africa); Australia and New Zealand (Oceania).

Participants were excluded from analyses if they had lived in the country they were sampled from for less than 5 years, exhibited obvious pattern responding ("flatlining" – giving the same rating for all items on scales where variation would be expected), or failed an attention check (an item in a scale instructing them to choose a specific option).

Measures.

These measures were included as part of larger surveys, with information about the other topics covered in study descriptions in Supplementary Information Section S2.3.

Translations. Countries where translations were used are listed in Supplementary Information, Section S2.5. A "back-translation" process was used. Surveys were translated from English by one bilingual translator which was then translated back to English by a second bilingual translator, with discrepancies resolved through discussion.

Ideal life lottery. The lottery question is described fully in Box 1, except that in non-US countries the lottery used an approximate US dollar conversion to the local currency using the nearest large number at the time of data collection (conversions used for each country are in Supplementary Information, Tables S4 and S5). We did not adjust for country purchasing power because high levels of wealth mean purchasing power is no longer relevant, e.g., with

US$100 billion one can choose to access/live anywhere in the world. In line with our research question, our focus was on comparing those who chose the highest amount possible (US$100billion) versus all lesser amounts.

Use of lottery wealth. In Study 1, directly under the lottery question we asked participants to indicate the most important change they would make with the money. A summary of responses is in the main paper, with more detailed description and analysis in Supplementary Information Section S4.4.

Values. We used short measures of values, which varied across studies but are both based on a widely-used model of values in psychology[38,39]. Study 1 used the Short Schwartz's Value Survey[40], and Study 2 used the Ten-item Value Inventory[41].

Demographics. Demographic information collected is described in detail in Supplementary Information, Section S2.5).

Data Availability:
Data and materials are available at:
Study 1: https://osf.io/25398/
Study 2: https://osf.io/k3wdp/

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Competing Interests Statement:
The authors have no competing interests to declare.

Box 1. The ideal life lottery question and response distributions in both studies.

Participants were presented with the ideal life lottery instructions below in their native language, and selected one of eight lottery options from $10,000 to $100 billion (expressed in their local currency to the nearest large number). In the figures the percentage who chose each lottery in each country are shown using coloured lines, with the black line representing the mean across countries. (Each country's data and currency conversion rates are in Supplementary Information, Tables S4 and S5).

Please think about what your absolutely ideal life would be like. You do not need to be concerned about whether you can realistically achieve this.

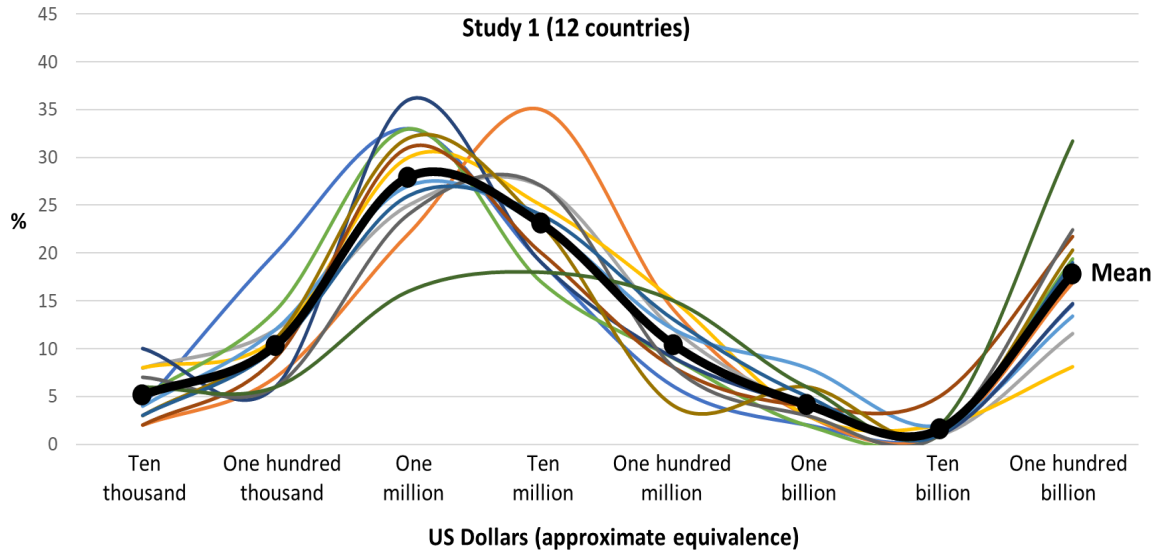
We want you to consider how much money you would want in your absolutely ideal life.

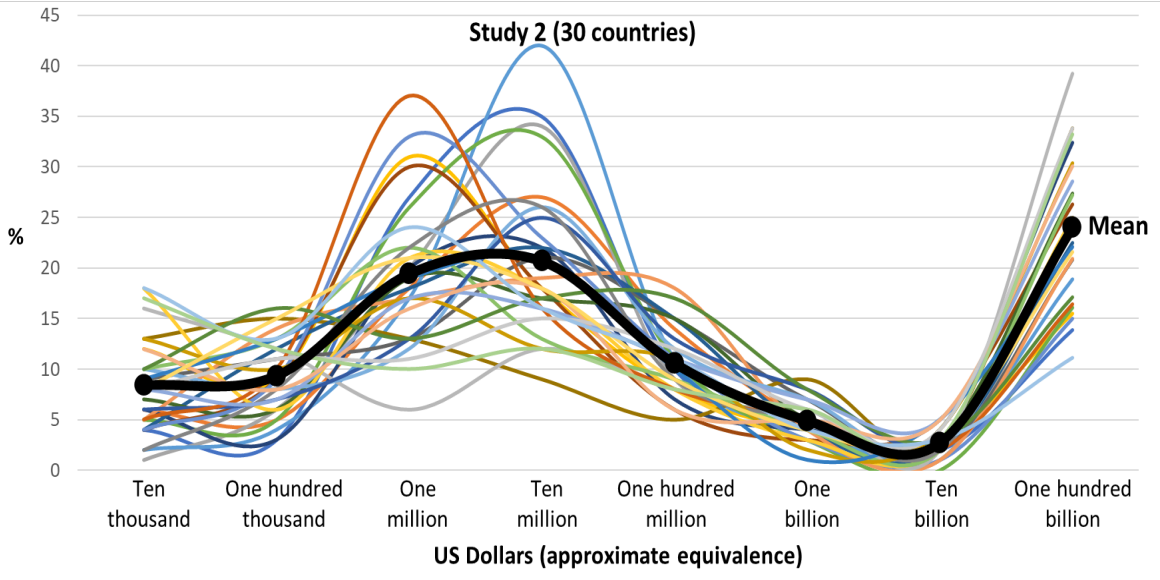
With this in mind, imagine that you were able to enter one of the lotteries below.

The chances of winning each lottery are equal - **you would have the same chance of winning no matter which lottery you enter.** That is, your chance of winning $10,000 would be the same as your chance of winning $100 billion.

Of course, this is hypothetical as we cannot afford to pay the prize. But we want to know which lottery you would choose if these opportunities were real, based on the amount of money you would have in your absolutely ideal life.

Which lottery would you choose to enter? A lottery for...





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