The Global Consumption of Truths and Big Lies in the Epoch of Digital Information Technologies: A Theoretical Analysis

Oluwole Owoye
Western Connecticut State University

This paper asserts that political leaders around the world and the emergence of digital information technologies have contributed remarkably to the amplifications and normalizations of telling big lies, thus the noticeable increase in the global consumption of big lies at varying degrees. To underscore this assertion, this paper uses the theoretical framework of utility maximization to show that human beings, in a world in which "we are all liars," consume truths and big lies subject to their information constraints. Furthermore, we use the concept of welfare economics to underscore the assertion that truths generate positive externalities, which can lead to outcomes that are social welfare-enhancing while big lies generate negative externalities, which can result in outcomes that are social welfare-retarding. The United States provides an illustrative example of a country where the consumption of big lies may be outpacing the consumption of truths because big lies have become the political philosophy of one of the political parties whose objective is to use big lies as the weapons of democracy destruction.

Keywords: amplification, truths, big lies, consumers, utility maximization, social welfare

INTRODUCTION

Worldwide, truths and lies are two among the natural socio-cultural-political goods, which human beings consume during their lifetimes. In other words, human beings consume different quantities of truths and lies on daily basis at varying degrees. Research scholars acknowledge that human beings are more truthful and honest because the average person tells "little white lies" at a minimum of once to twice per day. According to the voluminous studies on lies, there are different categories of people: those who tell little white lies and those who are prolific liars who tend to tell big lies. The consensus is that people tend to tell little white lies among their family members and friends, and their neighbors when they give compliments that are not completely genuine, tell someone they are doing well contrary to their true conditions, and tell people they are busy in order to avoid talking to them for an extended period of time or to avoid any time consuming engagement. In general, human beings are all liars because they tell white lies on daily basis with no severe consequences. The major issue is the magnitude of big lies from the pathological liars whose big lies can spread outside the domains of their family members, friends, and neighbors.

Over the past two or three decades, the emergence of digital information technologies (DITs), with unregulated social media platforms has amplified the transmission channels of truths and big lies.[1] The United Nations acknowledged that we live in an era of DITs, which can help make our world fairer, more peaceful, and more just through the support and acceleration in the desire to achieve each of the 17

Sustainable Development Goals by 2030. By the same token, DITs can also threaten privacy, erode security, and fuel inequality when DITs enable big lies to travel at nanoseconds. The consensus is that DITs generate, store, and process data, which could have positive effects on the one hand and non-positive effects on the other hand. The non-positive effect of the emergence of DITs is manifested by false news (big lies) travelling faster than true stories over the past two or three decades [Vosoughi *et al*. (2018), Dizikes (2018)]. In essence, this era of DITs has contributed to the amplifications of big lies with profound negative influence on the socio-political and the economic well-being of people around the world.

This paper contributes to the literature in two important ways by providing the theoretical economic perspectives, which are complementary to the studies that have examined "lying in economics." First, we use the concept of utility maximization to analyze the consumption of truths and lies in this era of rapid growth in digital information technologies. The assertion is that the consumption of truths and big lies depends on the prices that people pay to acquire all the instruments needed to gain access to DITs in order to consume both goods. The main constraints come from DITs, which have amplified the consumption or the demand for both truths and lies over the past two or three decades. Studies show that DITs have enabled big lies to travel a lot faster than truths in comparison to analog information technologies. In highlighting the amplification of big lies, this paper illustrates three different truths-lies consumption (TLC) paths to show the variations in people's consumption behavior, which varies across countries. In essence, the three TLC paths show three groups of people in countries around the world. We assume that there are people who prefer truths; therefore, they consume more truths than big lies. In contrast, there are people who prefer lies thus they consume big lies than truths, and there are people who are truths and big lies neutral because they tend to consume approximately equal quantities of truths and big lies.

Second, we use the concept of welfare economics to underscore the assertion that truths generate positive externalities, which can be *social welfare-enhancing* in achieving better health care outcomes while big lies generate negative externalities, which can be *social welfare-retarding* and harmful to the socio-political environments in countries worldwide. To underscore the social welfare implications of truths, which can viewed to be *social welfare-enhancing* and big lies, which can be deemed to be *social welfare-retarding* in terms of the public health care outcomes, this paper uses the presidential leaderships of Obama and Trump as good illustrative examples. President Obama's transparency and truthfulness in handling episodes of pandemics minimized the fatalities due to the pandemics and saved lives. In contrast, President Trump's opaqueness and big lies about COVID-19 pandemic caused the highest fatalities in the world. More importantly, this study is an acknowledgment of an era of the confluence of DITs and political leaders whose political philosophies are now driven by the harmful big lies with which they can incite political chaos and violence at different levels of government.

The rest of this paper is organized as follows. The next section provides the literature review of studies about truths and lies. After that, we provide the theoretical framework of utility maximization subject to constraints. Next, we discuss the social welfare consequences of truths and big lies. Finally, the paper provides some general discussions and conclusions with socio-political policy implications.

LITERATURE REVIEW

The Global Deception Research Team (2006) carried out two worldwide studies focusing on stereotypes of liars in 75 different countries associated with 43 different languages. The first study required participants to respond to the question "How can you tell when people are lying?" while the second study required participants to complete questionnaire about lying. Both studies revealed a dominant pan-cultural stereotype that liars tended to avert gaze more than any of the other stereotypical behaviors attributed to liars. Many studies have also analyzed and addressed the issue of truth-telling and lie-telling, and the consensus is that all human beings are liars of some sort on daily basis, except for a few who are prolific or pathological liars [Jones (2021)]. According Serota *et al*. (2021), most communication is honest and most lies are told by a few prolific liars. The authors examined 116,366 lies told by 632 participants over 91 consecutive days to address some pertinent research questions focusing on why do people lie, how often do people lie, how do people lie, who do people lie to, and what types of lies do people tell the most. The

authors found that lies are told for a variety of reasons such as trying to avoid contact with others, as a joke or prank, and as the shield required for self-protection; and that almost 80 percent of all lies are told face-to-face among friends, family members, and school or business colleagues. Overall, Serota *et al*. (2021) found that 88.6 percent of the reported lies could be described as "little white lies" and 11.4 percent could be classified as "big lies."

In a related study, Ekman (2018) listed nine major motives for telling lies: to avoid being punished, obtain a reward not otherwise readily available, protect someone else from punishment, protect one's self from physical harm, win the admiration of others, get out of awkward situation, avoid embarrassment, maintain privacy, and exercise power over others. According to Ekman (2018), the primary motivator for telling lies is to avoid punishment, and this implies that both children and adults tell lies as the defensive or self-protection mechanism. A similar study by Hammond (2018) identified 30 reasons why people lie. Among these reasons, people tell big lies as the instrument of vindictiveness, manipulation, attention-seeking, demonstration of superiority, control over others, gather sympathy or empathy about past or current events, and avoiding accountability are at the cornerstone of lie-telling in this era of DITs.

In a study by Hu *et al*. (2012), they asked whether a repeated lie becomes a truth and they investigated whether or not lying can be trained to be more automatic and less task-demanding since many studies provided evidence supporting the notion that lying is more task-demanding than truth-telling. In answering their research question, they used 48 participants randomly selected into three groups: the control group, instruction group, and the training group. The three groups were required to finish a reaction time-based differentiation of deception paradigm (DDP). The participants in the control group were required to finish the same task for a second time, those participants in the instruction group were instructed to speed up their deceptive responses in the second DDP, while the participants in the training group were trained to speed up their deceptive responses and then proceed to the second DDP. They found out that instruction alone significantly reduced the reaction times associated with participants' deceptive responses and that the differences between deceptive and truthful response were erased only in the training group thus this led to their suggestion that the performance associated with deception is malleable and could be voluntarily controlled with intention or training.

To highlight the rapidity with which false news spreads around the world in this era of DITs, Vosoughi *et al*. (2018) utilized a data set of 126,000 stories tweeted by 3 million people more than 4.5 million times. The authors classified news as true (truth) of false (lie) based on information from six independent fact-checking organizations and found that "falsehood diffused significantly farther, faster, deeper, and more broadly than the truth in all categories of information, and the effects were more pronounced for false political news about terrorism, natural disasters, science, urban legends or financial information." In addition, they pointed out that false stories inspired fear, disgust, and surprise in replies, which could incite domestic and/or international violence whereas true stories inspired anticipation, sadness, joy, and trust. According to the American Counseling Association (ACA, 2019), "we live in a world where lying has become a fairly common occurrence," and over the past two or three decades, this has compelled some organizations to specialize in fact-checking statements made by political leaders, and thereafter award Pinocchio's nose to showcase the magnitude of the big lies.

In analyzing the impact of digital technologies, the United Nations (2020) asked whether a digital futures belongs to all, and then addressed the future of work, the future of data analysis, the future of social media, and the future of cyberspace. An important part of their analysis is the issue with respect to social media, which provides easy accessibility to almost half of the entire global population as it enables people to make their voices (either truths or lies) heard and to talk to people worldwide in real times at unprecedented speed. According to the United Nation's analysis, the social media can also reinforce prejudices fostered by prolific liars who tend to sow discord by giving hate speeches. In other words, the social media platforms serve as the echo chambers that prolific lairs now use relentlessly for misinformation or disinformation or big lies.

Evangelista *et al*. (2014) examined the economic impact of digital technologies in Europe using composite information communication technology (ICT) indicators to capture the access to ICTs, the ability to use them, and the digital empowerment of individuals in key social and economic domains. They argued

that mere accessibility to ICT facilities is only a pre-condition for progress towards a digitized society, and that the level, the quality, and the conditions facilitating or hampering the use of these technologies play a much more important role. Based on their multiple econometric regressions, they concluded that digitalization may enhance productivity, employment growth, and that inclusive policies may effectively bridge the gap between the most favored and disadvantaged parts of the European population.

In a 44-chapter Oxford handbook on lying, edited by Meibauer (2018), the authors provided the "state-of-the-art account of past and current research on lying and deception." The authors of these chapters provided various definitions of lying and the subtypes of lying from linguistic, philosophical, and psychological perspectives, and they outlined the ranges of fields in which lying and deception play a role. In Chapter 38 of the handbook, Serra-Garcia (2018) explored several issues related to the examination of lying within the framework of economics. The study addressed the standard approach to studying lying, the aversion to lying, and then analyzed the question as to when individuals lie. In the analysis of the rationale for when individuals engage in lying, the study addressed the consequences of lies, lies and promises, social interaction, and the ways to decrease dishonesty. The takeaways from Serra-Garcia's (2018) study are that lies have contagion effects, which would generate widespread dishonest behavior by the next generation and that there are high moral costs to lying. More importantly, the authors in the handbook raised and addressed many popular questions such as "Is lie detection possible? Or is lying morally wrong? Furthermore, the handbook described the tools and approaches that are used by research scholars to analyze the topic of lying and deception, thus they contributed to establishing the vibrant new field of interdisciplinary research on lying.

Lemire's (2022) recent book detailed President Trump's big lies, which gained momentum in 2016 and in the 2020 presidential election. From Lemire's (2022) perspective, what stood out was the volume and ferocity of the big lies that President Trump told while in office, especially after the 2020 presidential election, and that big lies became the political philosophy of the Republican Party, thus exacerbating the political divisions in the United States. As a matter of historical fact, Trump's big lie caught national attention during the 9/11 2001 terrorists attack on the World Trade Center when Trump claimed that he saw the second plane hit the tower and that "Soon after, I went down to Ground Zero with men who worked for me to try and help in any little way that we could" [Brockell (2019)]. In addition, during an on-air interview with a German outlet on September 13, 2001, Trump's response to a question about possible involvement in the reconstruction: "Well I have a lot men down here right now. We have over 100, and we have about 125 coming. So we'll have a couple of hundred people down here." Trump employed the same template of big lie in the 2008 presidential election, which fueled the "birther" movement that challenged Obama's citizenship when Trump falsely announced the formation of his investigating team to look into Obama's birth certificate in Hawaii. Fact checkers did not confirm these claims.

THEORETICAL FRAMEWORK

This paper asserts that people cannot avoid the socio-cultural-political consumption of truths and lies; therefore, we assume that truths and lies are two naturally normal social goods that people consume in varying proportions. In other words, we assert that the optimal combination or consumption of truths and lies varies among people in different countries based on the reality that some countries today prefer to be governed by leaders who are pathological liars with little or no room for truths while others experience more truthful environment with less tolerant for lies, and others are truths-lies neutral. To illustrate the optimal combinations of the two naturally normal socio-cultural-political goods that people consume daily, we assume that the utility function (U) with respect to the socio-cultural-political environment in terms of truths (T_{ij}) and lies (L_{ij}) can be expressed as:

$$U_{ij} = f(T_{ij}, L_{ij}) \quad (1)$$

subject to the linear constraint

$$P_{Tij}T_{ij} + P_{Lij}L_{ij} = ICT_{ij} \quad (2)$$

where P_{Ti} and P_{Li} represent the prices of T_{ij} and L_{ij}, thus $P_{Ti}T_i$ and $P_{Li}L_i$ are the total expenditures on the tools (e.g. smartphones) necessary to gain access to truths and lies, respectively; and ICT_{ij} represents information and communications technologies, which could be analog information technologies (AITs) and/or digital information technologies (DITs), available to person i in country j. If we assume that both truths and lies entail sizeable expenditures, then we can interpret $\frac{P_{T_{ij}}T_{ij}}{ICT_{ij}}$ and $\frac{P_{L_{ij}}L_{ij}}{ICT_{ij}}$ as the shares of T_{ij} and L_{ij} acquired from or through ICT_{ij}, and that these vary across people depending on the socio-cultural and political environment in every country j.

The Lagrangian ($\mathscr{L}$) function for the constrained utility maximization function $f(T_{ij}, L_{ij})$, given in equation (1), subject to the linear constraint that $P_{Tij}T_{ij} + P_{Lij}L_{ij} = ICT_{ij}$ given by equation (2), can be expressed as:

$$\mathscr{L}(T_{ij}, L_{ij}, \lambda) = f(T_{ij}, L_{ij}) + \lambda(ICT_{ij} - P_{Tij}T_{ij} - P_{Lij}L_{ij}) \quad (3)$$

where all variables are as defined earlier, and λ is the Lagrange multiplier. Solving the constrained optimization problem corresponding to the Lagrangian function given in equation (3) involves the solution to a system of equations, which includes the first-order conditions for the Lagrangian function with respect to each of the argument variables of the utility or objective function and the linear equality constraint. That is, the first-order differentiations of equation (3) yield:

$$\frac{\partial \mathcal{L}(T_{ij},L_{ij},\lambda)}{\partial T_{ij}} = f'(T_{ij}) - \lambda P_{T_{ij}} = 0, \text{and } \lambda = \frac{f\prime(T_{ij})}{P_{T_{ij}}} \quad (4)$$

$$\frac{\partial \mathcal{L}(T_{ij},L_{ij},\lambda)}{\partial L_{ij}} = f'(L_{ij}) - \lambda P_{L_{ij}} = 0, \text{and} \lambda = \frac{f\prime(L_{ij})}{P_{L_{ij}}} \quad (5)$$

and

$$\frac{\partial \mathcal{L}(T_{ij},L_{ij},\lambda)}{\partial \lambda} = ICT_{ij} - P_{T_{ij}}T_{ij} - P_{L_{ij}}L_{ij} = 0 \quad (6)$$

Solving to remove λ in the first-order conditions derived in equations (4) and (5) yields:

$$\frac{f\prime(T_{ij})}{P_{T_{ij}}} = \frac{f\prime(L_{ij})}{P_{L_{ij}}} \quad (7)$$

and rearranging to obtain the optimal levels of truths (T_{ij}*) and lies (L_{ij}*) ratio, we have:

$$\frac{T^*_{ij}}{L^*_{ij}} = \frac{f\prime(L_{ij})}{f\prime(T_{ij})} = \frac{P_{L_{ij}}}{P_{T_{ij}}} \quad (8)$$

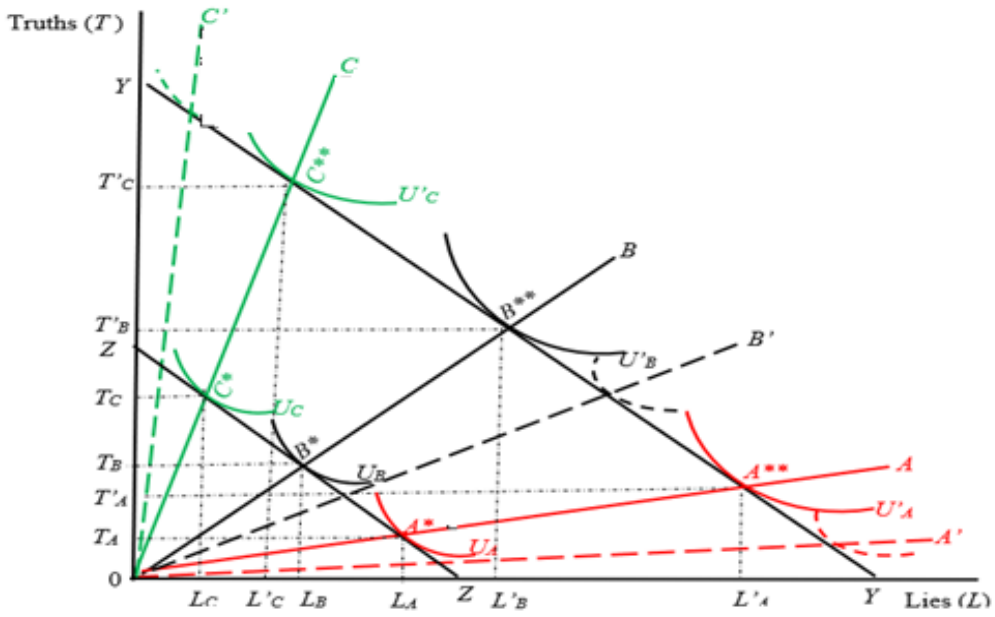
The optimal quantities of truths (T_{ij}*) and lies (L_{ij}*) or the ratio derived in equation (8) vary across countries; therefore, to highlight these variations, let us assume that there are three groups (A, B, and C) of people in every country. We consider the people in group A as those who prefer to consume lies (lies-lovers), people in group B are those who are truths-lies neutral, and people in group C are those who prefer to consume truths (truths-lovers). These three groups of people in each country are depicted in Figure 1 in which the quantity of truths (T_{ij}) consumed is measured along the vertical axis and the quantity of big lies (L_{ij}) consumed is measured along the horizontal axis. The feasible sets in this diagram are represented by the lines *ZZ*, which shows the combinations of T_{ij} and L_{ij} by the three groups of people in countries around

the world in the era of analog information technologies, while line *YY* shows the amplified consumption of T_{ij} and L_{ij} since the emergence of DITs. The slope of the truths-lies lines (*ZZ* and *YY*) is the ratio of the prices of big lies and truths. That is:

$$\frac{dT_{ij}}{dL_{ij}} = \frac{P_{L_{ij}}}{P_{T_{ij}}} \tag{9}$$

Similarly, the indifference curves U_A, U_B, and U_C, based on equation (1), represent the combinations of truths and lies with no change in utility for these three groups of people in different countries in the era of analog information technologies. Importantly, the indifference curves U'_A, U'_B, and U'_C represent the utility functions showing the combinations of truths and big lies since the emergence of DITs. In addition, lines *OA* for group A, *OB* for group B, and *OC* for group C represent the truths-lies consumption (TLC) paths as each group noticeably altered their consumption of T_{ij} and L_{ij} in the past three decades. Lines *OA'* and *OB'* reflect those people who consumed more big lies while line *OC'* reflects those people who consumed more truths.

FIGURE 1
CONSTRAINED CONSUMPTION OF TRUTHS-LIES IN COUNTRIES WORLDWIDE



Furthermore, T_A and L_A for group A; T_B and L_B for group B; and T_C and L_C for group C are the chosen combinations based on the principle of equal marginal utility (*MU*) per dollar spent to acquire T_{ij} and L_{ij}, respectively. That is, these are the points where the marginal utility of truths (MU_T) per $P_{T_{ij}}$ equals the marginal utility of lies (MU_L) per $P_{L_{ij}}$; and these are indicated at points *A**, *B**, and *C** where line *ZZ* is tangent to U_A, U_B, and U_C. These three tangencies portrayed the era of AITs. Similarly, line *YY* is tangent to U'_A, U'_B, and U'_C at points *A***, *B***, and *C***, and these new tangencies portrayed the shifts into the era of DITs. The changes in combinations from T_A and L_A to T'_A and L'_A for group A; T_B and L_B to T'_B and L'_B for group B; and T_C and L_C to T'_C and L'_C for group C reflect the increases in the consumption of both truths and lies due to the emergence of DITs over past three decades. The upward sloping TLCs (*OA* or *OA*' for group A, *OB* or *OB'* for group B, and *OC* or *OC*' for group C) indicate that T_{ij} and L_{ij} are naturally social goods that people consume in different countries. In Figure 1, we see that those people in group A

experienced $\Delta L_{ij} >> \Delta T_{ij}$; those people in group B witnessed $\Delta L_{ij} = \Delta T_{ij}$; and those people in group C experienced $\Delta L_{ij} << \Delta T_{ij}$, which is the opposite of what those people in group A experienced.

Finally, the simultaneous solutions to equations (4) – (6) yield:

$$T_{ij} = T_{ij} (P_{T_{ij}}, P_{L_{ij}}, ICT_{ij}) \quad (10)$$

$$L_{ij} = L_{ij} (P_{T_{ij}}, P_{L_{ij}}, ICT_{ij}) \quad (11)$$

$$\lambda = \lambda (P_{T_{ij}}, P_{L_{ij}}, ICT_{ij}) \quad (12)$$

$$ACT_{ij} = \sum_{i=1}^{Pop} \left(A_{T_{ij}} + B_{T_{ij}} + C_{T_{ij}}\right) \text{ and } GCT = \sum_{j=1}^{n} ACT_{ij} \quad (13)$$

and

$$ACL_{ij} = \sum_{i=1}^{Pop} \left(A_{L_{ij}} + B_{L_{ij}} + C_{L_{ij}}\right) \text{ and } GCL = \sum_{j=1}^{n} ACL_{ij} \quad (14)$$

Equations (10) and (11) indicate the consumption/demand curves of truths and lies for any given set of P_{T_i}, P_{L_i}, and ICT_{ij} in country *j*. For equations (13) and (14), ACT_{ij} and ACL_{ij} are the aggregate consumptions of truths and lies, respectively, for the three different groups of people in the entire population (*Pop*) in country *j*. Similarly, *GCT* and *GCL* are the global consumptions of truths and big lies, which are the sums of the aggregate or national consumptions of truths and big lies, respectively, for all countries (*n*) worldwide. Interpretatively, equation (10) represents the individual consumption or demand curves for T_{ij} holding constant $P_{L_{ij}}$ and ICT_{ij} while equation (11) captures the individual consumption or demand curves for L_{ij} holding $P_{T_{ij}}$ and ICT_{ij} constant in country *j*. In essence, U_A, U_B, and U_C are analogous to the demand curves representing the three groups of people illustrated in Figure 1, thus the change from analog information technologies (line *ZZ*) to digital information technologies (line *YY*) with U'_A, U'_B, and U'_C indicate the increases in demand by each group with different combinations of T'_{ij} and L'_{ij}. We hasten to add that the access to ICT_{ij} (AITs and/or DITs) by individual *i* varies across each country *j*.

From equations (13) and (14), the main proposition is that the aggregate benefits from telling the truths outweighed the aggregate damages done to the national economy from telling lies and/or that this also holds true for the global economy. Simply put, $ACT_{ij} > ACL_{ij}$ and $GCT > GCL$ in the era of AITs because big lies did not magnify and outpace the truths since people were more honest and truthful in their communications, thus people valued the respect they got for being honest. In the epoch of DITs, big lies are travelling faster with quick amplifications through social media platforms, and in the process, the damages from ACL_{ij} and *GCL* appeared to be immeasurable because the pathological liars tell ferocious big lies to gain more attention, power, and extremist supporters than those who tell the truths. Today, many political leaders do not consider telling big lies as unethical; therefore, they use big lies as the political football they can throw to gain the attention of their extremist supporters with the ultimate goal being the incitement of political violence and chaos. Given the current political landscape in the United States where big lies have become the political philosophy [Lemire (2022)] of the Republican Party, lines *OB* and *OA* (or *OB*' and *OA*') illustrate their transition from line *OC* or *OC*'. Other countries are facing the same transition because big lies are now globally contagious due to DITs.

THE SOCIAL WELFARE CONSEQUENCES OF TRUTHS AND BIG LIES

To show the effects of truths and big lies on social welfare in countries worldwide, this section draws from the concepts of social welfare economics[2] articulated by many economists such as Arrow (1950, 1951), Rawls (1972), Deaton (1997), Lambert (1993), and Champernowne and Cowell (1998). We utilize

the concept from welfare economics by assuming that the social welfare function (W) in country j depends on the consumption of truths and big lies by citizens, which is now enabled by the emergence of digital information technologies that citizens in rural and urban areas use on daily basis in all countries worldwide. Algebraically, this takes the form:

$$W_{ij} = W_{ij}\,[T_{ij}\,(ICT_{ij}\,),\, L_{ij}\,(ICT_{ij}\,),\, G_{ij}\,(E_{ij}\,)] \tag{15}$$

where T_{ij}, $L_{ij,}$ and ICT_{ij} are as defined earlier in equations (1) and (2), G_{ij} represents all capital and consumer goods[3] that are essential to sustainable economic growth and better development outcomes in this era of digital information technologies, which are fundamental to maximizing social welfare, and E_{ij} represents the social-political environments in country j where (i) live. The environments could be truths-dominant (TDE) or big lies-polluted (LPE) environments.

Arguably, it is challenging to attain the optimal social welfare in different groups or societies "where lying has become a fairly common occurrence" [ACA (2019)] and more prevalent or normalized in an era of DITs, which political leaders now use for their endless propagations of socio-political big lies with little or no room for the truths or ethical considerations. Studies show that repeated big lies by government officials could be more destructive. Furthermore, we assume that equation (15) is differentiable with respect to the composite explanatory variables, that is:

$$\frac{\partial W_{ij}}{\partial ICT_{ij}} = \frac{\partial W_{ij}}{\partial T_{ij}} \frac{\partial T_{ij}}{\partial ICTj_{ij}}\bigg|_{T_{ij}} > 0 \tag{16}$$

$$\frac{\partial W_{ij}}{\partial ICT_{ij}} = \frac{\partial W_{ij}}{\partial L_{ij}} \frac{\partial L_{ij}}{\partial ICT_{ij}}\bigg|_{L_{ij}} < 0 \tag{17}$$

$$\frac{\partial W_{ij}}{\partial E_{ij}} = \frac{\partial W_{ij}}{\partial G_{ij}} \frac{\partial G_{ij}}{\partial E_{ij}}\bigg|_{TDE_j} > 0 \tag{18}$$

and

$$\frac{\partial W_{ij}}{\partial E_{ij}} = \frac{\partial W_{ij}}{\partial G_{ij}} \frac{\partial G_{ij}}{\partial E_{ij}}\bigg|_{LPE_j} < 0 \tag{19}$$

while equation (16) shows that ICT_{ij} can enable the dissemination of truths through different social media platforms; therefore, it can be *social welfare-enhancing*, equation (17) shows that ICT_{ij} can amplify the propagations of big lies much faster than the truths; therefore, big lies can be *social welfare-retarding*. Interpretatively, equations (16) and (17) show both the positive and negative effects of digital information technologies, which the United Nations (2020) also alluded to. Given the velocity with which big lies spread through the use of digital information technologies transmitted via social media platforms that are easily accessible to rural and urban areas around the world, the question yet to be answered or resolved is whether the negative effects will outweigh the positive effects in the foreseeable future. More importantly, equations (16) and (17) reflect what many countries are experiencing in this epoch of globalization that has enabled the ease with which people can consume truths and big lies without verifications.

Equation (18) shows that social welfare will improve in truths-dominant environments (TDE) or countries. In other words, in countries where people are more truth-loving, they tend to demand transparency and accountability from their political leaders on how they utilize their scarce economic resources to achieve improvements in the social welfare. The production of more capital goods and consumer goods necessary to achieve improved living standards requires an environment with little or no tolerance for political leaders who consistently lied to the public because the building of public trust plays a very tangible role in government effectiveness. And according to the OECD (2017), "trust influences the

relationship between citizens and government…….; and that governments cannot function effectively without the trust of citizens, nor can they successfully carry out public policies, notably more ambitious reform agendas."

In contrast, equation (19) shows that social welfare deteriorates in big lies-polluted environments or countries (LPE), that is, $\frac{\partial W_{ij}}{\partial G_{ij}}\frac{\partial G_{ij}}{\partial E_{ij}}\Big|_{LPE_j} < 0$. In other words, the amplifications of lies enabled by the emergence of digital information technologies accessible through different social media platforms over the past two decades have contributed negatively to destabilize the socio-cultural and political environments, especially in countries where political leaders are not transparent and accountable for propagating baseless big lies using disinformation and conspiracy theories, which many citizens tend to willfully consume without verifications. In essence, political leaders who are truthful and transparent tend to earn the desirable public trust, which is essential in the strategic formulations and implementations of public policies aimed at the effective utilization of their scarce economic resources such as physical capital and human capital in order to improve the living standards.

Illustrative Examples of Truths and Big Lies by Political Leaders in the United States

In the past two decades, the United States provided some unique illustrative examples, which are relevant in analyzing the effects of political leaders who told more truths than big lies or more big lies than the truths while in office.[4] In this section, we discuss the illustrative examples of truths-telling and lies-telling that characterized how Presidents Obama and Trump handled the different episodes of epidemics and pandemics they experienced while in office. The handling of these infectious diseases corroborate the theoretical analysis of truths-telling and lies-telling laid out in equations (16) through (19) because the provision of better health care outcomes is central to social welfare maximization. After President Obama's inauguration in 2009, he summoned a meeting of the President's Council of Advisors on Science and Technology (PCAST) to find out what the president must do to prepare for the expected autumn outbreak of swine flu or H1N1. In hindsight, this was a strategically designed medical policy intended to be guided by the recommendations provided by the medical experts in order to enhance truthfulness and full transparency in conveying the true medical information to the general public [Karlawish (2020)].

By listening to the medical experts, President Obama allowed the public health experts to take the lead in providing true medical information; and this was aptly captured in President Obama's statement, "And I can assure you that we will be vigilant in monitoring the progress of this flu and I will make every judgment based on the best science available." President Obama's transparency and truthfulness in handling the pandemics manifested in the quick distribution of emergency equipment from the federal stockpile. It is important to point out that President Obama got the Congress involved at different times by requesting for $1.5 billion and $8.0 billion to ensure adequate supply of equipment and vaccines to handle internal outbreaks [Kates *et al*. (2015), Lander (2016), and Moss and Kates (2019)]. In addition, the outbreak of Ebola in 2014 in West Africa, especially in Guinea, Liberia, and Sierra Leone, prompted President Obama to deploy scientists, medical doctors, and over 3,000 military troops to the virus locations as the preemptive measure to prevent the outbreak of Ebola in the United States [Cooper *et al*. (2014)]. By building transparency and public trust in handling the pandemic, President Obama got Congress involved by requesting for $5.4 billion to fund the provision of vaccines and other medical equipment [Kates *et al*. (2015)]. Obviously, President Obama's experience with H1N1 in 2009 and Ebola in 2014 led to the formation of the Pandemic Response Team under the auspices of the White House National Security Council (NSC) Directorate in 2015.

In contrast, Karlawish (2020) pointed out that President Trump was anti-science right from the beginning of his administration and this was manifested by the takedown of the PCAST website on January 22, 2017 [Comms (2020)]. The PCAST was originally established in 1990, by President George H.W. Bush, Sr. as an advisory group of scientists and engineers to augment the science advice received from other White House advisors, departments, and agencies. Rather than follow the pandemic response template, which President Obama put in place in 2015, the Trump administration disbanded the White House

Pandemic Response Team in May 2018 in addition to the elimination of the position of the CDC epidemiologist stationed in China's Disease Control Agency after the epidemiologist left the post in July 2019. These were strategic policy actions that lacked transparency, which the Trump administration took to defund science [Sun (2018) and Karlawish (2020)].

More importantly, President Trump was fixated with using big lies embedded in conspiracy theories and disinformation as the strategic signaling device intended to mislead and convince his supporters that the COVID-19 pandemic was designed to cast doubt on his presidential leadership. In one of the press conferences in 2020, President Trump boldly announced, without any medical or scientific justification, that using bleach and/or hydroxychloroquine could quickly cure and eradicate the COVID-19 pandemic outbreak. Some ardent consumers of this false medical information or big lies quickly purchased bleach and hydroxychloroquine for consumption, which led to their demise. One of the worst outcomes of peddling big lies by President Trump manifested on January 6, 2021 when his ardent big lies-consuming supporters stormed the Capitol Hill on the big lie of the "2020 presidential stolen election." Today, many Americans still believe that the 2020 presidential election was stolen from President Trump, which is indicative that the repetitions of big lies can ultimately become the truths to those big lies-addicted consumers depicted by people in group A illustrated in Figure 1.

The main lesson learned from these two presidents was that truths-telling president can earn the desired public trust and thus unify the country in order to achieve better health care outcomes when confronted with episodes of pandemics. Between January 2017 and January 2021, the United State witnessed that the big lies-telling president contributed to political divisions and the destructions of health care outcomes. Since better health care (HC_{ij}) is one of the desired outcomes of social welfare maximization, we re-specify equation (15) to show that the truths-telling president achieved better health care outcomes for all Americans. In contrast, the lies-telling president achieved the opposite during COVID-19 pandemic. Algebraically, this is expressed as:

$$HC_{ij} = HC_{ij}\,[T_{ij}\,(ICT_{ij}\,.Pol_j),\, L_{ij}\,(ICT_{ij}.\,Pol_j),\, HI_{ij}\,(Pol_j\,.ME_{ij}),\, HI_{ij}\,(ME_{ij}.Pol_j)] \tag{20}$$

where T_{ij}, $L_{ij,}$ and ICT_{ij} are as defined earlier; HI_{ij} represents health care infrastructures such as the provisions of personal equipment protections (PEPs). As we may recall, President Trump falsely accused health care professionals of hoarding and selling PEPs for personal gains as COVID-19 pandemic was raging in 2020. Also, Pol_{ij} captures presidential or political leaderships (or prime ministers as in some European countries) who tell the truths or big lies, and ME_{ij} captures medical experts who provided the science-based medical guidelines and/or recommendations. Similarly, we assume that equation (20) is differentiable with respect to the composite explanatory variables, that is:

$$\frac{\partial HC_{ij}}{\partial Pol_{ij}} = \frac{\partial HC_{ij}}{\partial T_{ij}}\frac{\partial T_{ij}}{\partial ICT_{ij}}\frac{\partial ICT_{ij}}{\partial Pol_{ij}}\bigg|_{T_{ij}>0} > 0 \tag{21}$$

$$\frac{\partial HC_{ij}}{\partial Pol_{ij}} = \frac{\partial HC_{ij}}{\partial L_{ij}}\frac{\partial L_{ij}}{\partial ICT_{ij}}\frac{\partial ICT_{ij}}{\partial Pol_{ij}}\bigg|_{L_{ij}<0} < 0 \tag{22}$$

$$\frac{\partial HC_{ij}}{\partial ME_{ij}} = \frac{\partial HC_{ij}}{\partial HI_{ij}}\frac{\partial HI_{ij}}{\partial Pol_{ij}}\frac{\partial Pol_{ij}}{\partial ME_{ij}}\bigg|_{T_{ij}>0} > 0 \tag{23}$$

and

$$\frac{\partial HC_{ij}}{\partial Pol_{ij}} = \frac{\partial HC_{ij}}{\partial HI_{ij}}\frac{\partial HI_{ij}}{\partial ME_{ij}}\frac{\partial ME_{ij}}{\partial Pol_{ij}}\bigg|_{L_{ij}<0} < 0 \tag{24}$$

Equation (21) shows that presidential leaderships (Pol_j) can contribute to enhancing better health care outcomes by telling the science-based medical truths, either by using *IT* or through press conferences, based on the recommended medical guidelines provided by the medical experts or professionals as shown by equation (23). In contrast, equation (22) is an indication that presidential leadership can contribute to worsening health care outcomes (cases and fatalities) due to the unethical and deliberate disinformation about the most effective ways to curtail pandemics, which contradicted the science-based recommended guidelines provided by medical experts.

Essentially, equation (23) demonstrates that a transparent truths-telling president, who relied on the recommendations provided by medical experts on how to curtail pandemics, actually achieved better *HC* outcomes for the citizens. In contrast, equation (24) illustrates that a president who displayed the traits of a pathological liar with blatant self-aggrandizement, self-projection, self-deception, and projected himself to know much better than the highly trained medical experts – about the medical procedures on how to curtail a pandemic – ultimately contributed to achieving negative *HC* outcomes in the United States. These negative *HC* outcomes, which came from the president's propagations of medical lies to the public influenced the denials of the COVID-19 pandemic and the hesitancies to wear face masks and vaccinations by those who continued to consume President Trump's ferocious big lies about the pandemic in the United States [Owoye and Onafowora (2021b)]. In essence, President Trump's big lies about the COVID-19 pandemic and the unquestionable results of the 2020 presidential election have succeeded in achieving the complete political divisions [Owoye and Josi (2022)], which further amplified the demand for racial and gender hatred [Owoye and Onafowora (2021a)], both of which now put American democracy on the precipice of destruction [Owoye (2022)]. Simply put, big lies pose the greatest danger to the United States from many dimensions. Big-lies have amplified racial-gender hatred and political divisions, but importantly, the erosion of public trust that may lead to the demise of representative democracy.

DISCUSSIONS AND CONCLUSIONS WITH SOCIO-POLITICAL POLICY IMPLICATIONS

This study complements the studies that have examined and provided multidisciplinary perspectives about the telling of lies and truths in countries around the world. From economics perspective, this study asserts that truths and lies are two naturally normal social goods that people consume daily subject to information constraint. This assertion is in consonant with studies that claim "we are all liars" since people tell little white lies for different reasons throughout their lifetimes, and a few are pathological liars. Given the consensus about lies and truths, this paper uses the conventional utility maximization framework to show the optimal chosen levels of consumption of lies and truths in the era of analog information technologies, when studies did not consider lies to travel faster than the truths. The argument is that the emergence of digital information technologies has increased the velocity of lies through the social media platforms that are easily accessible to people in very rural and urban areas around the world. Simply put, the DITs have provided lies with the most powerful megaphones now drowning the truths than ever before.

In the utility maximization analysis, we assume that every country has three groups of consumers of truths and lies. There are those who are truth-loving and lies averse, those who are lies-loving and truth averse, and those who are truths and lies neutral. Since we live in a world of lies where we are all liars, we employ the utility maximizing framework to show that digital information technologies have increased and amplified the consumption of truths and lies. Furthermore, we utilize the economics of social welfare to underscore the assertion that a president who told the truths about the precautionary measures necessary to mitigate the severity of a pandemic actually enhanced health care outcomes since truths generate positive externalities. In contrast, a president who told big lies about the pandemic actually retarded health care outcomes because the lies caused medical confusions and mistrusts.

Metaphorically, truths may not be able to catch-up with big lies in this era of DITs because truths-tellers are not fixated with getting their supporters to follow them on social media platforms whereas pathological liars relentlessly feed their extremist supporters with big lies as the signal intended to call on them to take violent actions. In terms of policy implications, it is obvious that big lies have deleterious externalities if we agree that abusive and vindictive political leaders can use baseless big lies intentionally as the ultimate

instrument of manipulation intended to cause harm to others. Similarly, political leaders who seek attention and adulation, project superiority, and pursue control over other people use baseless lies, which can destabilize the political economy. The main takeaway is that people should not underestimate the damage to the socio-political environment in countries where some political leaders are considered as pathological liars. This is particularly important because the United States provides a good illustrative example under the presidencies of Trump and Obama. According to fact-checking organizations, President Trump told 30,573 lies during his four-year tenure in office, which his extremist supporters consumed with no verifications. In contrast, President Obama told a maximum of 18 or 22 little white lies during his eight-year tenure.

It is important to note that some of the dire consequences of big lies include the erosion in public trust, political chaos or divisions, and the implicit incitements of domestic violence that the United States witnessed on January 6, 2021 Capitol Hill insurrection when President Trump's big lies about the "stolen presidential election" almost succeeded as the "*weapons of democracy destruction*." It is therefore imperative for countries such as the United States to address the ease with which political leaders can propagate and transmit big lies through social media platforms in this era of DITs because these cumulative big lies will ultimately undermine public trust and destabilize the political economy. Furthermore, people need to be well-informed that the big lies told by their Machiavellian pathological liars are poisonous to all dimensions of governance. It is time therefore for every civic society to demand unquestionable truthfulness and accountability, otherwise domestic violence perpetrated by the extremist consumers of the big lies will escalate into the foreseeable future as many of these consumers will continue to willfully consume the big lies propagated by their political leaders who are pathological liars because they have eviscerated the normal ethical standards in politics. The normalization of big lies told by their devious pathological liars should not be embraced as the new norm because doing so will stain human decency, integrity and dignity, undermine the rule of law, eviscerate all democratic norms, and thus put their democracies on the precipice of destruction.

In this era of DITs where the big lies are weaponized to travel faster and cause immeasurable wreckages along the big lies-pathways, it would be delusional if people continue to subscribe to the old aphorism that "truths will catch-up and overtake lies." Figuratively, truths may be stuck and too weak to catch-up with the big lies due to DITs given the ferocious propagations of baseless big lies through unregulated social media platforms; therefore, truths may need both national and global *truths-reorientations* in order to repair the wreckages caused by the big lies. To repair the cumulative wreckages may take one or two generations to achieve. This paper concurs with the perception that people are mostly honest except for a few pathological liars. However, the few pathological liars are more powerful in the 21st century because DITs have enabled the proliferations and amplifications of their baseless lies, more so, since big lies now resonate much longer with the extremist supporters and grab their attentions in the social media echo chambers more than the truths. For example, the adorations and the on-going hero-worshipping of political leaders who are pathological liars in the United States may signal to future generations of political leaders that telling voluminously malicious big lies is the quickest pathway to achieve absolute power and adorations from extremist supporters. The danger is that these extremist supporters are ready to commit heinous crimes based on the violence-induced big lies propagated by their political leaders who are pathological liars. Overall, political pundits need to recognize that the dissemination and exaggeration of the relentless big lies, over the social media platforms, are the modern-day *weapons of democracy destruction* around the world.

ENDNOTES

1. This paper uses true, truth, or trust interchangeably and this also applies to lies, falsehoods, and false news. Little lies are considered to be inconsequential relative to big lies that are harmful and destabilizing to public governance.
2. For detailed coverage of the essential concepts of welfare economics, see any standard microeconomics textbook.

3. Capital goods are goods used to produce other goods and services, such as infrastructure investment in roads, bridges, power/electricity supply and many other social amenities.
4. See Leonhardt *et al*. (2017) and McCarthy (2017) for the detailed discussions and the graphical illustrations of Trump's lies compared with Obama's. Fact-checking organization reported that Trump told 30,573 lies in four years (20.9 lies per day) compared to Obama who told between 18 and 22 lies in eight years (roughly 0.007 lies per day) in office.

REFERENCES

American Counseling Association. (2019). *Understanding Why People Lie.* Retrieved from https://www.counseling.org/news/aca-blogs/aca-counseling-corner/aca-counseling-corner-blog/2019/10/21/understanding-why-people-lie

Arrow, K.J. (1950). A Difficulty in the Concept of Social Welfare. *Journal of Political Economy*, *58*, 328–346.

Arrow, K.J. (1951). *Social Choice and Individual Values.* Wiley, New York.

Brockell, G. (2019). *What Was Trump Actually Doing on 9/11?: Anniversary Fact Check*. Retrieved from https://www.washingtonpost.com/history/2019/09/11/what-was-trump-actually-doing-an-anniversary-fact-check/

Champernowne, D.G., & Cowell, F.A. (1998). *Economic Inequality and Income Distribution*. Cambridge University Press, United Kingdom.

Comms, E. (2020). *An Embattled Landscape Series, Part 2a: Coronavirus and the Three-Year Trump Quest to Slash Science at the CDC*. Retrieved from https://www.washingtonpost.com/news/to-your-health/wp/2018/05/10/top-white-house-official-in-charge-of-pandemic-response-exits-abruptly/

Cooper, H., Shear, M.D., & Grady, D. (2014). *U.S. to Commit Up to 3,000 Troops to Fight Ebola in Africa*. Retrieved from https://www.nytimes.com/2014/09/16/world/africa/ obama-to-announce-expanded-effort-against-ebola.html

Deaton, A. (1997). *The Analysis of Household Surveys*. World Bank, The Johns Hopkins University Press, Baltimore and London.

Dizikes, P. (2018). Study: On Twitter, False News Travels Faster Than True Stories. *MIT News on Campus and Around the World*.

Ekman, P. (2022). Why Do People Lie? Retrieved from https://www.paulekman.com/blog/why-do-people-lie-motives/

Evangelista, R., Guerrieri, P., & Meliciani, V. (2014). The Economic Impact of Digital Technologies in Europe. *Economic of Innovation and New Technology*, pp. 1–46.

Hammond, C. (2018). *30 Reasons Why People Lie*. Retrieved from https://psychcentral.com/exhausted-woman/2018/03/30-reasons-why-people-lie#2

Hu, X., Chen, H., & Fu, G. (2012). A Repeated Lie Becomes a Truth? The Effect of Intentional Control and Training on Deception. *Frontiers in Psychology*, *3*, 1–7.

Jones, C. (2021). *We Are All Liars*. Orion Publishing Group, Limited.

Karlawish, J. (2020). *A Pandemic Plan Was in Place, Trump Abandoned It – and Science – in the Face of COVID-19*. Retrieved from https://www.statnews.com/2020/05/17/the-art-of-the-pandemic-how-donald-trump-walked-the-u-s-into-the-covid-19-era/

Kates, J., Michaud, J., Wexler, A., & Valentine, A. (2015). The U.S. Response to Ebola: Status of the FY2015 Emergency Ebola Appropriation. *Issue Brief*, pp. 1–9. The Henry J. Kaiser Family Foundation.

Lambert, P. (1993). *The Distribution and Redistribution of Income*. Manchester University Press, Manchester, United Kingdom.

Landler, M. (2016). *Obama Asks Congress for $1.8 Billion to Combat Zika Virus*. Retrieved from https://www.nytimes.com/2016/02/09/us/politics/obama-congress-funding-combat-zika-virus.html

Lemire, J. (2022). *The Big Lie*: *Election Chaos, Political Opportunism, and the State of American Politics After 2020*. Macmillan Publishing Company.
Leonhardt, D., Philbrick, I.P. & Thompson, S.A. (2017). Trump's Lies vs. Obama's. *The New York Times*.
Markowitz, D. (2021). Who Lied More During Their First 100 Days: Biden, Trump, Or Obama? *Forbes*.
McCarthy, N. (2017). How Trump's Lies Compare With Obama's. *Statista*.
Meibauer, J. (Ed.). (2018). *The Oxford Handbook of Lying*. Oxford University Press.
Moss, K., & Kates, J. (2019). *The U.S. Congress and Global Health: A Primer*. The Henry J. Kaiser Family Foundation. Retrieved from https://www.kff.org/global-health-policy/report/the-u-s-congress-and-global-health-a-primer/1-22
OECD. (2017). *Trust and Public Policy: How Better Governance Can Help Rebuild Public Trust*. OECD Public Governance Reviews, OECD Publishing, Paris.
Owoye, O. (2022). The Strangulation and Resuscitation of Representative Democracy in the United States. *Journal of Applied Business and Economics*, *24*(2), 1–18.
Owoye, O., & Josi, A. (2022). The Analysis of Political Divisions in the United States, 1900-2020. *International Journal of Business and Social Science*, *13*(3), 1–11.
Owoye, O., & Onafowora, O.A. (2021). The Demand for Hatred in an Era of Political Divisiveness in the United States. *Journal of Management Policy and Practice*, *22*(1), 9–23.
Owoye, O., & Onafowora, O.A. (2022). The Massive Spread and Fatalities of the COVID-19 Pandemic in the USA: Symptoms of Leadership Failure. *International Journal of Public Leadership*, *18*(2), 134–150.
Patel, D. (2018). The Impact of Digital Technologies On Society. *Digital India*. Retrieved from https://www.gbim.com/the-impact-of-digital –technologies-on-society/
Serota, K.B., & Levine, T.R. (2015). A Few Prolific Liars: Variation in the Prevalence of Lying. *Journal of Language and Social Psychology*, *34*(2), 138–157.
Serota, K.B., Levine, T.R., & Docan-Morgan, T. (2021). Unpacking Variation Lie Prevalence: Prolific Liars, Bad Lie Days, or Both. *Communication Monographs*, pp. 1–25. Retrieved from https://www.gwern.net/docs/psychology/2021-serota.pdf
Serra-Garcia, M. (2018). Lying in Economics. In J. Meibauer (Ed.), *The Oxford Handbook of Lying* (Chapter 38, pp. 495–505). Oxford University Press.
Sun, L.H. (2018). *Top White House Official in Charge of Pandemic Response Exits Abruptly*. Retrieved from https://www.washingtonpost.com/news/to-your-health/wp/2018/05/10/top-white-house-official-in-charge-of-pandemic-response-exits-abruptly/
The Global Deception Research Team. (2006). A World of Lies. *Journal of Cross Cultural Psychology*, *37*(1), 60–74. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2957901/pdf/nihms23948.pdf
United Nations. (2020). *The Impact of Digital Technologies*. Retrieved from https://www.un.org/en/un75/impact-digital-technologies
Vosoughi, S., Roy, D., & Aral, S. (2018). The Spread of True and False News Online. *Science*, *359*(6380), 1146–1151.