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# Conspiracy Theory Belief and Education: A Critical Social Analysis

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## Abstract

Research on conspiracy theories has revealed a significant association between conspiratorial thinking and education. The relationship is complex, however, and has so far been limited primarily to investigations of personal psychological attributes. This paper argues, instead, in favour of a broader social research perspective, specifically, one informed by a dialectical materialist philosophy. A secondary analysis of publicly available international data sourced from economic institutions and other organisations on conspiratorial belief, educational performance measures, unemployment, inequality and corruption perception was carried out. Conspiratorial belief was taken as a collective public epistemological phenomenon across countries, to explore the role of contemporary education systems across societies, and the degree to which they are successfully nurturing an effective form of critical thinking. A dialectical materialist philosophical approach was instrumental in formulating the study scope and interpreting the findings, given the use of countries as the fundamental unit of analysis. Multiple regression analysis was used to examine the relationship between belief in conspiracy theories and education, taking into account social context using unemployment, inequality, and corruption as control variables. The findings showed that the relationship between conspiratorial thinking and education held at the societal level, and was mediated by additional social factors. The paper goes on to argue, by virtue of the nature of the mediators, that education systems generally tend to fall short of effective and socially-engaged forms of critical pedagogy.

**Keywords:** Conspiracy theories, education, critical thinking, critical social theory, critical pedagogy, dialectical materialism

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**Conspiracy theory belief**

Controversial ideas about the origins of the COVID-19 disease, and doubts about vaccine safety, mask use, as well as other concerns, prompted somewhat of a revival in public awareness about probable conspiratorial dimensions of important issues and events in society. Conspiracy theories are particularly interesting in the context of education, in part because both areas can be said to occupy common epistemological and attitudinal grounds. In this sense, conspiracy theories appear predisposed to reveal useful insights about the role of education in society, definitions and implications of various forms of critical thinking, as well as the nature and adequacy of pedagogical approaches applied by education systems within broader settings of interacting social conditions.

Conspiracy theory belief (CTB) has mainly been conceptualised in the literature using a psychological deficit approach (see Galliford & Furnham, 2017; Lantian et al., 2021; Swami et al., 2014). It is typically portrayed as an example of erroneous reasoning, or a diminished capacity among individuals to engage in effective critical thinking. However, using a dialectical materialist philosophical and scientific perspective (Thalheimer, 1927; White, 1996), individuals can be conceptualised as interacting elements in a larger totality, itself bearing distinctive qualitative characteristics amenable to observation and study. This paper, therefore, considers the relationship between CTB and education beyond the level of interacting elements intrinsic to individuals, by focusing on the unique qualitative characteristics that emerge at the broader societal level. Key literature is reviewed first, followed by a description of the quantitative methodology and regression analysis techniques used to examine international public secondary data. Finally, there is a discussion of the findings grounded in the paradigm of critical educational theory, with a special focus on the concept of critical thinking.

**Conspiracy theories and personal attributes**

Attributing key issues, events, circumstances or conditions in society to the nefarious machinations of small groups of people, while simultaneously rejecting associated scientific or rational consensuses, are key features of conspiratorial thinking, according to popular definitions (Douglas et al., 2019; Heins, 2007). Some examples of popular conspiracy theories included in a recent international YouGov poll, were based on deliberate government cover-ups of, among others, alleged contact with extra-terrestrial beings, faked moon landings, known dangerous effects of vaccines, and intentional spread of AIDS (YouGov, 2021). CTB, taken as a natural consequence of conspiratorial thinking, is considered to have a generally detrimental effect on society, with anti-vaccine conspiracy theories having led to the resurgence of rubella and other diseases, and racist conspiracy theories to violence against Jews and other groups (Uscinski, 2018). To make matters worse, believing one conspiracy theory tends to increase the likelihood of believing others, even when they are contradictory (Sutton & Douglas, 2020). The desire to more fully understand the general nature of conspiracy theories and their prevalence, therefore, has prompted a growing body of academic and scientific research, and the discovery of several key trends.

Some of the characteristics found to correlate with CTB include low self-esteem, low conscientiousness, low emotional stability, agreeableness (Galliford & Furnham, 2017), perceptions of control (van Prooijen, 2017), and extreme political belief (Sutton & Douglas, 2020; van Prooijen et al., 2015). Other studies have found links between critical and analytical thinking skills, and decreased CTB (Lantian et al., 2021; Swami et al., 2014). It is interesting to note, that much of this work on CTB has involved conceptualising conspiratorial thinking in terms of personal psychological traits and deficits. This has had the effect of placing CTB

increasingly within a sphere of individual/personal responsibility. From this view, high CTB can be regarded as a consequence of an individual's own erroneous thinking, or lack of capacity for cognitive complexity. Consequently, there is a growing consensus that CTB is inversely correlated with an individual's amount of education (Douglas et al., 2015; Douglas et al., 2019; Galliford & Furnham, 2017; Goertzel, 1994; Van Prooijen, 2017).

**Conspiracy theories and education**

The claim that more education means more cognitive complexity, and in turn leads to a reduced proclivity among individuals to believe in conspiracy theories, however, is overly simplistic. Indeed, van Prooijen (2017) acknowledged that the relationship between CTB and education is more complex than it initially appears. Using multiple regression analysis, van Prooijen showed that when controlling for additional psychological processes, the main effect of education on CTB was no longer significant. Mediating factors included in the study were subjective social class, feelings of powerlessness, and a tendency to believe in simple solutions to complex problems (van Prooijen, 2017). Other studies have not found any significant effect of education on CTB in populations with strong perceptions of oppression or marginalisation (Crocker et al., 1999; Davis et al., 2018; van Prooijen, 2017).

It is worth noting that while such investigations have been directed predominantly inwardly at personal characteristics, many of the mediating factors unearthed (powerlessness, oppression, marginalisation, and subjective social class) are social in nature, based on interactions between individuals and their external communities. The foregoing mediating factors, and varying effects across different study populations, ultimately lend credence to Heins' (2007) assertion that the sources underlying CTB are more likely embedded primarily in society, and not in the individual. Van Prooijen (2017) also points out that there is, fundamentally, a collective (and therefore social) element to believing in conspiracy theories. They are, essentially, shared beliefs among communities of people, typically in response to common experiences of major events like economic crises, natural disasters, epidemics and wars.

Likewise, as well-known critical education theorists like Henry Giroux and Peter McLaren argue, education also forms part of a much more complex, integrated, and intermeshed web of social, political and ideological phenomena, and cannot be divorced from context. In the critical pedagogical framework, learners are encouraged to evaluate their own circumstances and experiences in terms of the larger social structures in which they are embedded. A learner's world, and their knowledge of it, exists in a defined social, political, historical, and ideological context (Boronski, 2022; Giroux, 2021; McLaren, 2016). Rather than operating as an independent factor that explains or predicts variations in CTB, therefore, it is likely that education is itself subject to common underlying social factors. The socially-embedded nature of both conspiratorial thinking, and education, renders sociological analysis a vital complement to existing psychological approaches currently dominating the public narrative on emerging conspiracy science, as well as the education-related claims made therein.

**Conspiracy theories and critical thinking**

Critical thinking, which few dispute as a central and worthy aim of education, has also been found by researchers to inversely correlate with CTB (Lantian et al., 2021; Swami et al., 2014). As a concept, critical thinking is useful for explaining the variations in CTB that we commonly attribute to education, and the increased cognitive complexity it is thought to develop. Simply put, the studies cited here collectively imply that education works (in reducing CTB), in part due to its ability to improve critical thinking ability. Critical thinking (and the education systems that promote it), is thereby presented as a form of treatment, to correct the problem of the

deficient thinking reflected in high levels of CTB in society. These assertions, however, are based on a relatively narrow definition of critical thinking, specifically, as the capacity for applying analytical/logical principles in the context of argumentation (Lantian et al., 2021; Swami et al., 2014).

Critical social theories, on the other hand, imply a different, broader definition. They conceptualise critical thinking largely in terms of a capacity for recognising, reflecting upon, understanding, and challenging exploitative, hegemonic, and unjust social, economic, and political structures (Bronner, 2011; Geuss, 1981). Proposing politics as a defining factor here, however, introduces somewhat of a paradox, since studies have also linked CTB with political extremism (van Prooijen et al., 2015). Given the substantial difficulty of accurately categorising positions along some abstract (supposedly acontextual and ahistorical) political spectrum as more or less "extreme", the worrying possibility emerges, of persuasively dismissing almost any form of critical thinking that questions dominant political paradigms, as conspiratorial.

The present study, therefore, departed from the assumption that an excessively narrow or individualistic perspective on the CTB-education question, runs the risk of naïveté to valuable social context, leading to paradoxical and misleading public perceptions about conspiracy theories, rationality more generally, as well as the greater role of education in society.

**Dialectical materialism and understanding contemporary conspiratorial thinking in society**

A dialectical materialist philosophical and scientific perspective (Thalheimer, 1927; White, 1996) has been cited as a strong influence on the conceptualisation of this work. While dialectical materialism is typically associated with historical processes, it has been applied in a deeper sense, as a means of rethinking almost any form of process humans endeavour to understand. Popkova and Tinyakova (2013), for instance, use the approach in an attempt to reconceptualise economic growth, not as an independent phenomenon but as part of a greater process of social development. Instead of focusing on isolated parts of a system and then generalising or theorising to an abstract whole, dialectical materialism starts with the whole and looks to understand how the parts fit in, or more importantly, at the interconnectivity and relationships that exist between those parts. Focusing too closely on fragmentated and atomised individual parts implies disconnection, and ultimately, alienation.

In the Earth sciences, Chatterjee and Ahmed (2019) explain how dialectical materialism is often used as a metaphor for intersection, interconnectivity, and the idea of physical space as dynamic. Like humans and nature, parts and wholes are mutually constitutive. They embody relations that are internal and dynamic, not external or accidental, and are thereby central to our understanding of the nature of things. Like economic growth, conspiratorial thinking is embedded in a social structure, and represents a qualitative feature of society as a whole. 'Qualitative' is not to be misunderstood here in the methodological sense. The scope of the present study was to bring alternative philosophical and methodological approaches to bear on understanding unique categories that emerge from society in its contemporary form of complexity, namely, conspiratorial thinking as a collective epistemological phenomenon in contemporary societies.

From the dialectical materialist perspective, fixed at the level of societies as the fundamental unit of analysis, therefore, while taking into account additional social factors and a broader definition of critical thinking as a worthy aim of education, the main research questions driving the study were:

RESEARCH QUESTION 1; Taking countries as the fundamental unit of analysis representative of whole societies, what is the relationship between CTB and education from the social, as opposed to individual, perspective?
RESEARCH QUESTION 2; How is this relationship mediated by additional key social factors across societies?
RESEARCH QUESTION 3; What can such relationships tell us about education systems across societies, as socially embedded sites for the development of effective critical thinking?

## Methods

### Data collection

A non-experimental quantitative approach, with ordinary least squares multiple regression analysis of secondary public data was used in the study. Countries were chosen as the basic unit of analysis, to examine variations across societies rather than across individuals, under the dialectical materialist assumption that unique and observable qualitative characteristics emerge at such a level. Five variables were operationalised using data extracted from several public sources including the World Bank (2021), YouGov (2021), OECD (2021), and Transparency International (2021). The most recent available data were used in every instance, unless predating 2015, in which case omissions were made. The main dependent variable (y) was operationalised using international public polling data from YouGov (2021), originally based on 21 countries (although Egypt, Saudi Arabia, Nigeria and South Africa were eventually eliminated due to lack of available data across the remaining variables), and was intended as a general measure of the degree of belief in conspiracy theories within each country. The sample sizes from the original YouGov poll in the 17 countries selected ranged between 1001 and 1383 per country, with a mean sample size of 1071.24 (SD=114.10).
Only those conspiracy theories of truly international scope were retained from the original YouGov poll. The conspiracy theories directly related to Donald Trump and the 9/11 terrorist attacks were considered too US-centric, and therefore omitted. This was done in an attempt to disentangle measurement of the construct of conspiratorial belief more generally, from knowledge and attitudes about, and exposure to, US affairs and politics specifically, given that the US represented only one country in the sample. The omitted conspiracy theories included collusion between Trump and the Russian government leading up to the 2016 US elections, and the alleged complicity of the US government in carrying out the 9/11 terrorist attacks on US cities. All the remaining conspiracy theories from the original YouGov poll were included in the study, and considered to be of sufficiently international scope, for the benefit of the majority of other countries in the sample. These pertained to a final total of six conspiracy theories, namely: known yet covered-up harmful effects of vaccines (CT1), a specific group of people running the world regardless of who is elected into national governments (CT2), anthropogenic climate change as a hoax (CT3), covered-up contact with extra-terrestrials (CT4), deliberate and covered-up spread of AIDS (CT5), and faked moon landings (CT6). The original poll was based on surveying participants on their degree of belief in each conspiracy theory, via the choices: definitely false, probably false, don't know, probably true, definitely true. The main CTB variable was extrapolated by taking into account only the proportions of people choosing the probably true and definitely true options, combined, and summed for every conspiracy theory. In other words, the proportions of respondents indicating belief in each of the conspiracy theories included in the study, were summed to create one total score of CTB per country, to act as a continuous numerical measure of general belief. Since the constituent values for this score were proportions, the final variable was independent of the actual population sizes of the countries included in the initial YouGov poll. The values for y were treated as approximately

normally distributed (Skewness=.35, Kurtosis=2.42). Table 1 presents the five main variables and their sources, followed by a justification for the remaining explanatory variables.

**Table 1**

**Main variables**

| | Label | Description | As a measure of | Source |
|---|---|---|---|---|
| Y | CTB | Conspiracy Theory Belief | Belief in conspiracy theories | YouGov |
| $x_1$ | PISA* | Total PISA score including reading, science and maths | Efficacy of secondary education system | OECD |
| $x_2$ | Unemployment | Proportion of working-age population unemployed | Unemployment | World Bank |
| $x_3$ | Gini** | Index of economic inequality (World Bank estimate) | Inequality | World Bank |
| $x_4$ | CPI** | Index of perceived corruption | Public service corruption | Transparency International |

Note. The five main variables and their sources
* PISA: Programme for International Student Assessment.
**CPI: Corruption Perceptions Index

The main independent explanatory variable of interest ($x_1$) was intended to represent some measure of educational level across countries, and test the main hypothesis of a significant association with CTB in response to research question 1. While level of education is a commonly selected metric for measuring the "quality" or "strength" of education in individuals using some form qualification framework, Programme for International Student Assessment (PISA) results (OECD, 2021) were chosen as a metric to represent the "quality" or "strength" of national educational systems across countries.

The merits of PISA testing are not without controversy, particularly in the field of critical education theory. Nevertheless, despite their relatively narrow scope (reading, maths and science), and questions about their validity as measures of true efficacy in light of increasing pressure among countries to improve their international PISA rankings at all costs, they were considered a useful metric for two main reasons. First, given that PISA tests are carried out at the secondary level, they address a part of the education system that engages with a larger proportion of the total population than other educational outcomes like, say, graduate and postgraduate education rates. And second, whether PISA scores are representative of true efficacy or some specific PISA-related national strategy, they nevertheless indicate a degree of value countries are willing to attach to the overt performance of their national education systems. To obtain a total PISA score for each country, the individual scores for reading, maths and science, were summed.

The remaining three social factors were included in the study as control variables, to test the main hypothesis associated with research question 2, that social factors mediate the relationship between CTB and education. These control variables were selected according to their prominence as themes in the critical education literature. Critical educational scholars have been particularly harsh in their condemnation of the contribution of neo-liberal ideology, and the spread of unfettered global capitalism, to the intensification of socio-economic injustices and inequality around the world (Boronski, 2022; Giroux, 2021; Hill et al., 2019; McLaren, 2016). To this effect, World Bank (2021) estimates of the Gini co-efficient of income inequality were included as a general representation of wealth and social inequality. The co-efficient is measured on a scale from 0 to 1, with higher scores representative of higher inequality.

According to Heins (2007), pathological neo-liberal capitalism and market competition has made normal, or like second nature, the permanent insecurity of all conditions of life. Unemployment rates across countries were therefore included as a representation of an arguably pathological, yet key, structural feature of contemporary neo-liberal capitalist societies. Unemployment rates were sourced directly from World Bank (2021) latest online data (from 2020), as proportions of total labour force in each country.

And finally, the Corruption Perceptions Index (CPI) was included as a measure of the systemic greed and corruption Giroux (2003) so passionately condemns in his writings, the dissolution of which, he argues, represents a key goal of critical education in a functioning democracy. CPI scores are not based on surveys of the general public, but rather, country experts and business leaders. They have been positively correlated with public perceptions of bribery, and are generally considered a valid measure of public sector corruption (Transparency International, 2021). For CPI, it should be noted that the valence is reversed when compared to the other variables included in the study. In other words, higher values on the index correspond to a lack of corruption (or a "clean" public service system).

The final dataset comprised a total of 17 countries: Australia (AUS), Brazil (BRA), Canada (CAN), Denmark (DNK), France (FRA), Germany (DEU), Greece (GRC), Hungary (HUN), Italy (ITA), Japan (JPN), Mexico (MEX), Poland (POL), Spain (ESP), Sweden (SWE), Turkey (TUR), United Kingdom (GBR) and United States (USA). This selection of countries resulted in only three missing data points across the five variables included in the study. PISA data were not available for Spain and data on the GINI coefficient were not available for Australia and Japan.

**Data analysis**

The data were collated from their various sources and imported into R Studio (v1.1.414) running on a Linux Ubuntu (v18.10) operating system. First, Pearson's r was used, together with a visual evaluation of the scatter plots to get an initial sense of the data and interrelationships between the five variables. Ordinary least squares multiple regression was then used to explore the relationship between y and $x_1$, while controlling for each of the other $x_n$ variables (including interaction terms), as follows:

**Table 2**

**Multiple regression models**

| | Model | Description | Logic |
|---|---|---|---|
| 1 | $y=b_0+b_1x_1+b_2x_2$ | CTB ← PISA + Unemployment | If the Education term is no longer significant when controlling for Unemployment, then the relationship between CTB and Education is mediated by Unemployment |
| 2 | $y=b_0+b_1x_1+b_2x_2+b_3x_1x_2$ | CTB ← PISA + Unemployment + Interaction | If the Interaction term is significant, then the relationship between CTB and Education depends on Unemployment |
| 3 | $y=b_0+b_1x_1+b_2x_3$ | CTB ← PISA + GINI | If the Education term is no longer significant when controlling for Inequality, then the relationship between CTB and Education is mediated by Inequality |
| 4 | $y=b_0+b_1x_1+b_2x_3+b_3x_1x_3$ | CTB ← PISA + GINI + Interaction | If the Interaction term is significant, then the relationship between CTB and Education depends on Inequality |
| 5 | $y=b_0+b_1x_1+b_2x_4$ | CTB ← PISA + CPI | If the Education term is no longer significant when controlling for Corruption, then the relationship between CTB and Education is mediated by Corruption |
| 6 | $y=b_0+b_1x_1+b_2x_4+b_3x_1x_4$ | CTB ← PISA + CPI + Interaction | If the Interaction term is significant, then the relationship between CTB and Education depends on Corruption |

Note. Models tested and the underlying logic planned for their interpretation

The models were evaluated based primarily on the significance levels of their constituent terms. The model interpretation drew heavily on Baron and Kenny's (1986) logic for mediation analysis. Table 2 includes the logic used for interpreting each model in terms of mediation and dependence of the control variables. As per social science convention, an alpha level of .05 was used for determining statistical significance of the individual terms. In other words, within the Neyman-Pearson statistical paradigm, the null (or "no effect") hypothesis for interpreting p values for individual terms in the models was $H_0=b_n=0$, and the alternative, $H_A=b_n\neq0$, with a threshold for rejection of the null set at the 95% confidence level ($\alpha=.05$).

## Results

Ordered according to CTB as the dependent variable and main outcome of interest, Table 3 shows the basic descriptive statistics pertaining to the pooled data across the 17 countries, and all five variables.

**Table 3**

**Descriptive Statistics**

| Country | CT1 (%) | CT2 (%) | CT3 (%) | CT4 (%) | CT5 (%) | CT6 (%) | CTB (%) | PISA (score) | Unemployment (%) | Gini (index) | CPI (index) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TUR | 48 | 57 | 26 | 41 | 40 | 28 | 40 | 1388 | 13.11 | 41.9 | 40 |
| MEX | 41 | 59 | 17 | 44 | 23 | 30 | 36 | 1248 | 4.45 | 45.4 | 31 |
| GRC | 39 | 56 | 23 | 33 | 24 | 22 | 33 | 1360 | 16.3 | 32.9 | 50 |
| HUN | 34 | 45 | 22 | 36 | 19 | 23 | 30 | 1438 | 4.25 | 29.6 | 44 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ESP | 30 | 56 | 19 | 23 | 23 | 22 | 29 | / | 15.53 | 34.7 | 62 |
| BRA | 27 | 47 | 22 | 31 | 18 | 24 | 28 | 1201 | 13.69 | 53.4 | 38 |
| POL | 31 | 47 | 21 | 22 | 21 | 18 | 27 | 1539 | 3.16 | 30.2 | 56 |
| USA | 33 | 37 | 27 | 29 | 18 | 13 | 26 | 1485 | 8.05 | 41.4 | 67 |
| ITA | 30 | 45 | 15 | 26 | 15 | 14 | 24 | 1431 | 9.16 | 35.9 | 53 |
| CAN | 29 | 37 | 18 | 30 | 14 | 13 | 24 | 1550 | 9.46 | 33.3 | 77 |
| FRA | 39 | 36 | 14 | 18 | 17 | 9 | 22 | 1481 | 8.01 | 32.4 | 69 |
| AUS | 21 | 33 | 20 | 24 | 12 | 14 | 21 | 1497 | 6.46 | / | 77 |
| DEU | 31 | 31 | 16 | 13 | 11 | 12 | 19 | 1501 | 3.81 | 31.9 | 80 |
| JPN | 30 | 18 | 14 | 21 | 11 | 14 | 18 | 1560 | 2.8 | / | 74 |
| SWE | 26 | 23 | 15 | 15 | 8 | 14 | 17 | 1507 | 8.29 | 30 | 85 |
| GBR | 19 | 27 | 9 | 20 | 7 | 10 | 15 | 1511 | 3.74 | 35.1 | 77 |
| DNK | 15 | 21 | 12 | 11 | 5 | 16 | 13 | 1503 | 5.64 | 28.2 | 88 |
| Mean (SD) | 30.76 (8.20) | 39.71 (13.17) | 18.24 (4.92) | 25.71 (9.41) | 16.82 (8.32) | 17.41 (6.28) | 148.65 (44.05) | 1450 (103.94) | 7.99 (4.39) | 35.75 (6.94) | 62.82 (17.71) |

Note. Country values on each variable, ordered primarily by CTB, including the mean and standard deviation for each variable

## Main effects

The main association of interest, between CTB and education (as defined by overall PISA scores) at the cross-country level, was both strong and statistically significant ($r=-.65$, $p<.01$). The inverse nature of the correlation indicated that, as expected, and according to the general assumption that CTB and education are inversely correlated, when PISA scores increased, CTB decreased. More broadly speaking, therefore, and in response to research question 1, when pooled countries or whole societies are taken as the units of analysis instead of individuals, we can still make the claim that there is a relationship between education and conspiratorial thinking. This finding supports the claims made elsewhere, mostly from within the psychological theoretical paradigm, that CTB and education are indeed inversely correlated (Douglas et al., 2015; Douglas et al., 2019; Galliford & Furnham, 2017; Goertzel, 1994; Van Prooijen, 2017). Closer examination of Figure 1 raises the possibility of some non-linearity in the relationship. This could indicate that CTB drops more rapidly where PISA scores are highest, or that other, possibly geo-cultural, factors not included in the study were significantly influencing the relationship

**Figure 1**

Scatter plot showing the relationship between CTB (y) and total PISA score ($x_1$)

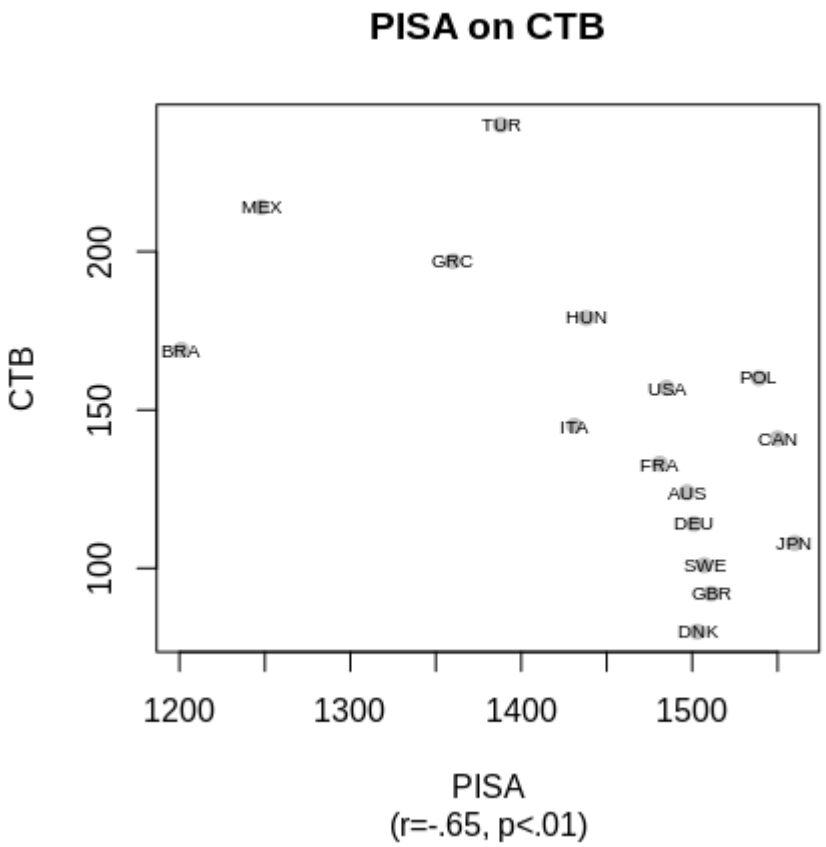



Table 4 presents a correlation matrix of the relationships between all five variables in the study.

**Table 4**

**Inter-relationships between variables**

| | CTB | PISA score | Unemployment | Gini | CPI |
|---|---|---|---|---|---|
| **PISA score** | **r=-.65**<br>**p<.01**** | | | | |
| **Unemployment** | r=.50<br>p=.04* | r=-.51<br>p=.04* | | | |
| **Gini** | r=.51<br>p=.05 | r=-.81<br>p<.001*** | r=.34<br>p=.21 | | |
| **CPI** | r=-.89<br>p<.001*** | r=.81<br>p<.001*** | r=-.33<br>p=.20 | r=-.63<br>p=.01* | |

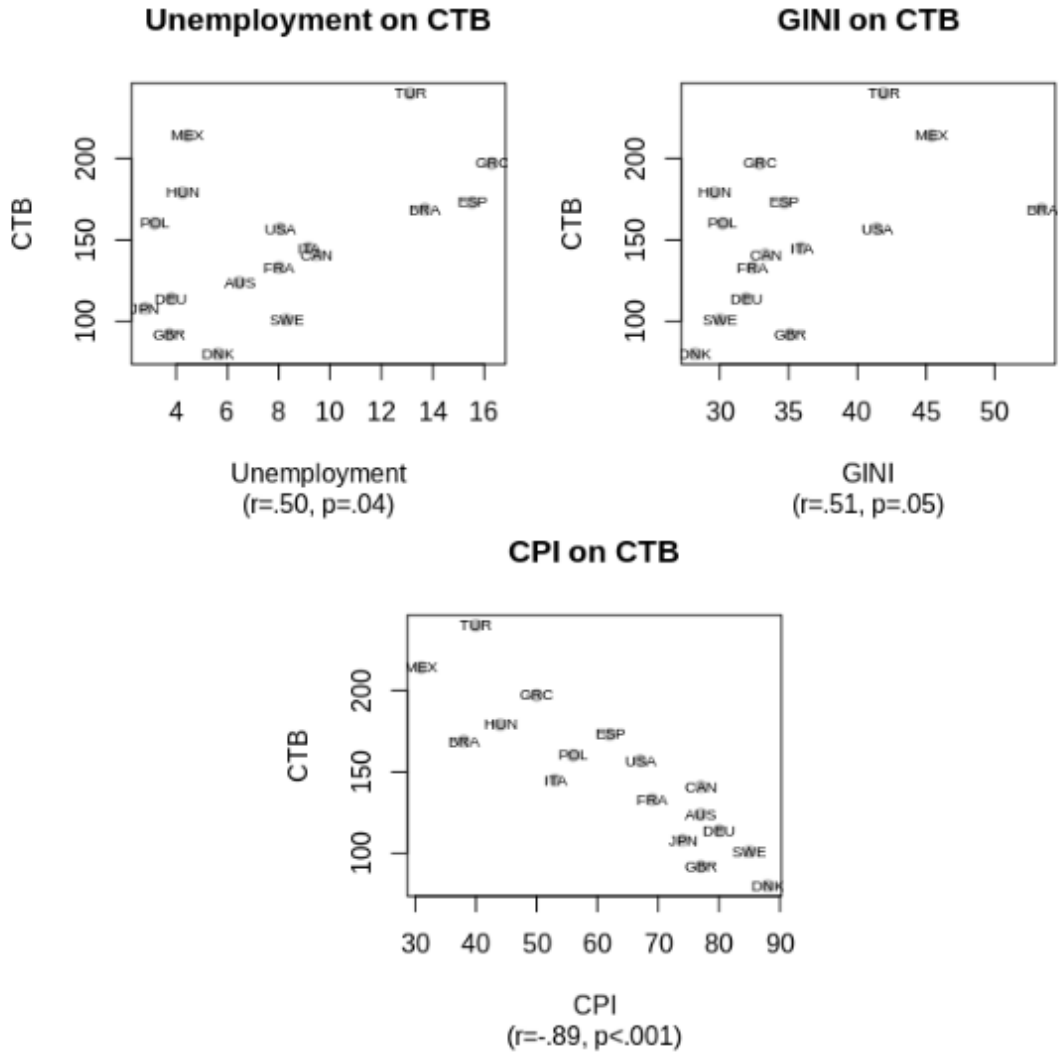
Note. Correlation matrix showing all inter-relationships between the main five variables

Table 4 confirms that CTB was indeed correlated with both unemployment and CPI as key social factors. What is perhaps more pertinent, however, was the higher degree of correlation between PISA scores and all three social factors. It was clear from the outset, before applying any form of multiple regression analysis, that there was a high degree of inter-correlation between all the variables, generally supporting the idea that CTB and education both exist in a shared context of common social denominators. This provides some evidence for a country level association between conspiratorial thinking and educational outcomes, in turn

demonstrating the relevance of social context in considering this phenomenon. The scatter plots in Figure 2, meanwhile, give a visual indication of the relationships between CTB and each of the social factors.

**Figure 2**

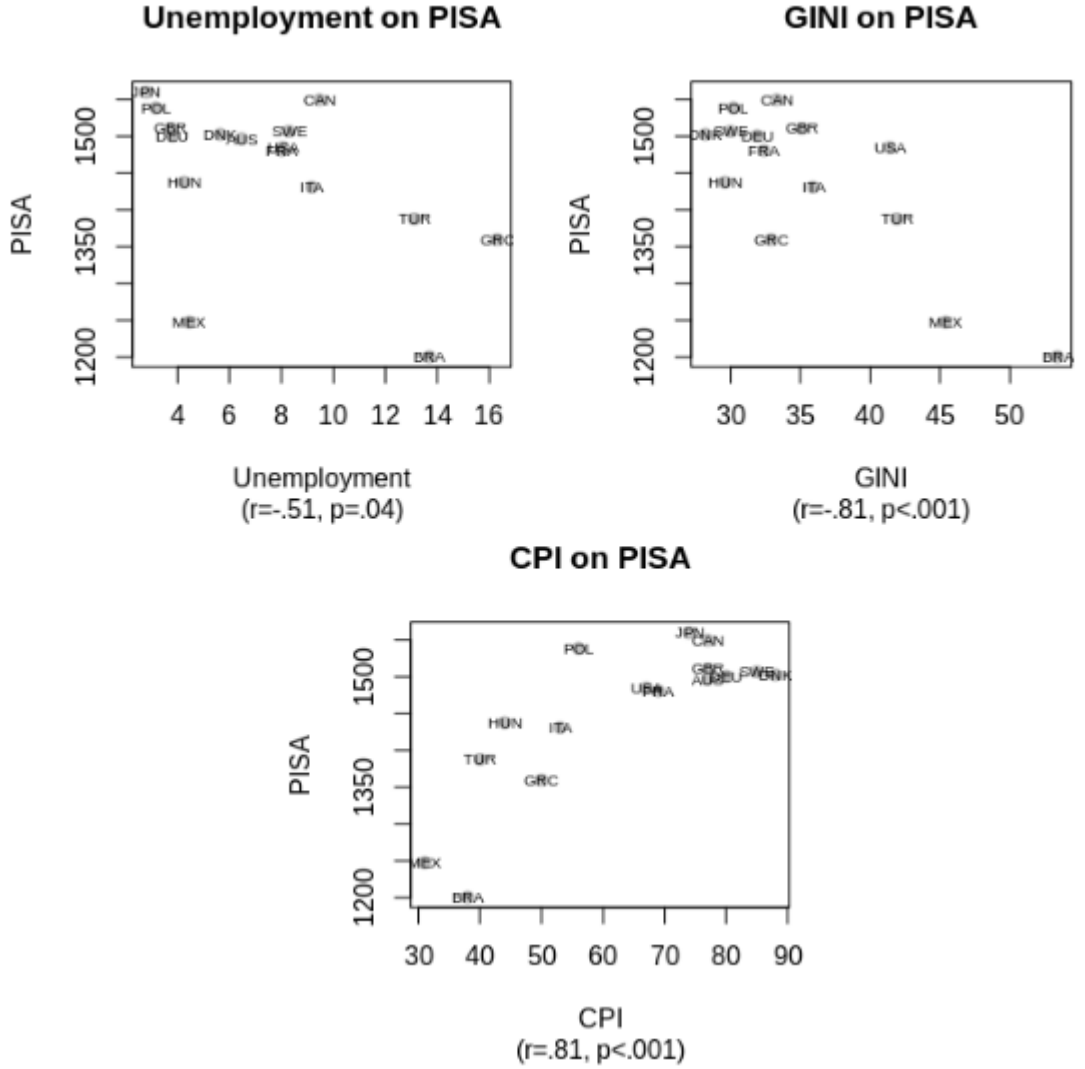
Selection of scatter plots for the relationship between CTB and the three social factors




The significant correlations between PISA scores and the three social factors, shown below in Figure 3, support the central theme in critical education theory, that education should not be considered in isolation, and is a socially contextualised phenomenon.

**Figure 3**

Selection of scatter plots for the covariances between PISA scores and the three social factors




## Multiple regression models

Given that the main correlation between CTB and PISA scores was both strong and significant (r=-.65, p<.01), and covariance between education and the social factors was high, the exploratory multiple regression models facilitated a more in-depth and nuanced analysis of the data. Table 5 shows the outputs for the first of three sets of models, namely, Models 1 and 2. Model 1 looked at the effect of PISA scores on CTB, while controlling for unemployment. Model 2 simply included the interaction term between PISA scores and unemployment in the model. The underlying logic (Baron & Kenny, 1986), was identical for all three sets of models, and therefore also applies for Models 3 and 4 (inequality), and Models 5 and 6 (corruption), respectively. In the case of Model 1, if PISA scores (after having been initially determined as significantly correlated with CTB) were no longer significant after controlling for unemployment, then the relationship between CTB and PISA scores could be said to have been mediated by unemployment. Furthermore, in the case of Model 2, if PISA scores and unemployment were not merely affecting each other, but rather, operating harmoniously and in concert to simultaneously direct changes in CTB, then a significant interaction term would

indicate that the relationship between PISA scores and CTB was not just mediated by, but dependent on unemployment.

## Unemployment

**Table 5**

**Effects of unemployment**

| **Model 1 ($R^2$=.46, F=5.46, p=.02*)** | | | | **Model 2 ($R^2$=.52, F=4.26, p=.03*)** | | | |
|---|---|---|---|---|---|---|---|
| $x_1$ | PISA | $b_1$=-.24 | p=.04* | $x_1$ | PISA | $b_1$=-.45 | p=.05* |
| $x_2$ | Unemployment | $b_2$=2.31 | p=.40 | $x_2$ | Unemployment | $b_2$=-34.82 | p=.28 |
| | | | | $x_1x_2$ | Interaction | $b_3$=.03 | p=.25 |

Note. Multiple regression outputs for Models 1 and 2
For p values; *, **, and *** indicate significance at the 95%, 99%, and 99.9% levels, respectively

Model 1 showed that PISA scores retained a significant effect on CTB, even after controlling for unemployment (p=.04). Also, the interaction term in Model 2 was not significant (p=.25). These findings indicate that the relationship between CTB and PISA scores was not mediated by, and did not depend in any way on, unemployment. In other words, unemployment and education clearly did not interact in any way to affect CTB.

Education appears to have the stronger underlying connections with, albeit across two separate pathways, both CTB and unemployment. This suggests that the higher the PISA scores are, the more likely we are to see both lower CTB, and lower unemployment, but these outcomes are not necessarily inter-related.

## Inequality

**Table 6**

**Effects of inequality**

| **Model 3 ($R^2$=.38, F=3.43, p=.07)** | | | | **Model 4 ($R^2$=.58, F=4.59, p=.03*)** | | | |
|---|---|---|---|---|---|---|---|
| $x_1$ | PISA | $b_1$=-.26 | p=.17 | $x_1$ | PISA | $b_1$=-1.40 | p=.03* |
| $x_2$ | Gini | $b_2$=.30 | p=.91 | $x_2$ | Gini | $b_2$=-38.88 | p=.06 |
| | | | | $x_1x_2$ | Interaction | $b_3$=.03 | p=.06 |

Note. Multiple regression outputs for Models 3 and 4
For p values; *, **, and *** indicate significance at the 95%, 99%, and 99.9% levels, respectively

Model 3 showed that the effect of PISA scores was no longer significant when controlling for inequality. This was a clear indication that Gini scores had a significant mediating effect on the relationship between PISA scores and CTB. The interaction term in Model 4 was near statistical significance (p=.06), and so cannot confidently support the claim that education and inequality act in concert to direct changes in conspiratorial thinking. We can nevertheless conclude that mediation was evident in Model 3, so the evidence supports the broader claim that, in response to research question 2, the relationship between CTB and education is mediated by additional social factors.

## Corruption

**Table 7**

**Effects of corruption**

| **Model 5 ($R^2$=.82, F=28.74, p=<.001***)** | | | | **Model 6 ($R^2$=.82, F=18.07, p<.001***)** | | | |
|---|---|---|---|---|---|---|---|
| $x_1$ | PISA | $b_1$=.09 | p=.34 | $x_1$ | PISA | $b_1$=.19 | p=.44 |
| $x_2$ | CPI | $b_2$=-2.60 | p<.001*** | $x_2$ | CPI | $b_2$=1.14 | p=.89 |
| | | | | $x_1x_2$ | Interaction | $b_3$=<.01 | p=.65 |

Note. Multiple regression outputs for Models 5 and 6
For p values; *, **, and *** indicate significance at the 95%, 99%, and 99.9% levels, respectively

Models 5 and 6 had the most statistical power, and explained the highest proportion of variation in CTB of all the three sets ($R^2$=.82). Model 5 showed that not only did PISA scores lose their significant effect on CTB when controlling for CPI (indicating mediation), but that corruption was by far the stronger influence of the two ($b_2$=2.60, p<.001). A more appropriate way of looking at this relationship using Baron and Kenny's (1986) logic of mediation, given the initially strong and inverse relationship between CPI and CTB, is that PISA scores did not mediate the effect of CPI (rather than the other way round). This means that corruption had the strongest effect of all on CTB (r=-.89, p<.001), and education did nothing to mitigate this effect. Model 6 further substantiates the notion that CPI and PISA scores do not interact in any way to affect CTB. As was the case with inequality, therefore, the inclusion of corruption in the analysis further indicated that social factors had a significant mediating effect on the relationship between CTB and education. All three social factors had slightly different effects on the relationship, so a deeper evaluation was needed to form any additional assumptions about the extent of social engagement and criticality among contemporary education systems in the context of research question 3, which was concerned with what the foregoing regression analysis results can tell us about the interaction between critical thinking and education. Figure 5 shows the covariance between corruption perception and PISA scores.

## Discussion

The main aim of the study described in this paper was to explore conspiratorial belief as a social, as opposed to a purely individual, phenomenon. Using a dialectical materialist perspective, CTB was treated as a phenomenon responsive to interacting qualitative characteristics existing at the societal level, beyond the scope of those operating strictly within the individual, intrinsic, domain. Pooling data according to country (or society) as the fundamental unit of analysis, helped to address the main aim, while maintaining the intended philosophical orientation. The trends observed, therefore, refer to the sampled countries/societies collectively, constituting the sort of unique qualitative characteristics dialectical materialism posits are amenable to study at various levels of reality, or in this case, society as a totality distinctive from the individual. It is on this basis that all claims about any proposed social characteristics of conspiracy theories and education, are made. These are further developed and more broadly discussed below.

Uscinski (2018) argued that conspiracy theories can serve as alarm bells, trip wires, or early warning systems in society, and thus, according to Heins (2007), they are not always entirely irrational. Zembylas (2021) argued, accordingly, against treating conspiracy theories through a narrow epistemic lens in pedagogical contexts, but rather, to remain mindful of their broader ethical and political motivations and implications. In this sense, a total lack of conspiratorial thinking in a society that is, for instance, highly corrupt, would strongly indicate a suppression of freedom to question or criticise injustices and hegemonic power structures. Yet, given that education is typically expected to foster a commitment to the methods of rigorous and falsifiable

academic or scientific enquiry (Uscinski, 2018), as well as an awareness of any scientific consensus that might exist on given matters of interest (Douglas et al., 2015), we would still expect it to ultimately have the effect of lowering CTB. So the point is, that while education systems are indeed expected to lower CTB, in free and critically-engaged societies they will not, and indeed should not, eradicate it entirely.

A critical pedagogical style of general education would encourage learners to bring the tools of rigorous academic and scientific analysis to bear on thinking about the broader social structures and conditions that shape their personal experiences (Boronski, 2022; Giroux, 2021). Given its basis on a fusion of academic rigour and social engagement, we would ultimately expect a critical educational system to actively engage with social factors in exerting a concerted effect on existing CTB, as expressed by the interaction terms in the statistical models presented. Based on this logic, the non-significance of the terms in each set of models provides some insight about the state of criticality in contemporary education systems. They basically raise some concerns, about the ability of international education systems to act in concert with undesirable social conditions, in exerting some observable coordinated influence on conspiratorial thinking. The findings suggest more in-depth analyses of similar interactions between education systems and other important social conditions, would be useful, preferably at multiple levels across individuals, institutions as well as societies.

It should be noted, however, that despite Models 5 and 6 (relating to corruption) having the most explanatory power, the three control variables behaved slightly differently in the three sets of models, and this variability can provide some additional nuance to the analysis. Methodologically, this study was based on the premise that CTB should be understood as a social, rather than an individual, phenomenon. Tendencies towards the latter perspective foreground the operation of a fundamental and culturally prominent philosophical principle; that of ideological individualism. It was argued above, that prominent approaches in existing research have fixed belief in conspiracy theories, firmly within the sphere of individual/personal responsibility. The pervasiveness of such neoclassical values can be seen clearly enshrined in the OECD's own educational policies. "Taking responsibility" is emphasised as one of three fundamental "transformative competencies" and guiding principles (OECD, 2022), for the development of learners into tomorrow's individual economic actors and citizen consumers.

In the context of conspiratorial thinking, the pervasiveness of ideological individualism and personal responsibility helps in part to explain the different behaviours of corruption, inequality and unemployment observed in the statistical models presented above. First-hand experiences of blatant systemic corruption, for instance, are relatively visible and overt forms of injustice, and can quite easily be attributed to the malicious machinations of other individuals or groups of conspirators. Blatant corruption, therefore, is less likely to be rationalised or explained away by individuals as stemming from their own responsibility as, say, being unemployed. The presence of a reserve labour army of unemployed workers provides the sense of "permanent insecurity" for workers that Heins (2007) identifies as a systemic symptom of pathological neo-liberal capitalism. It has become "second nature", and is seen as an inevitability for at least some of the workers in a society at any given time. Unemployment is thus unlikely to appear as either patently unjust, or attributable to conspiring groups of malicious others.

The distinction in the data between corruption (as well as, to a lesser degree, inequality), and unemployment, ultimately supports the notion that the latter condition has become assimilated into the neo-liberal tendency to blame underachievement on oneself, to be rationalised and accepted as poor exercising of one's personal responsibility (Reay, 2012). It is interesting to note that, in this context, education appears to have been successful at severing the link between unemployment and conspiracy, but not so in the case of more conspicuous conditions like

inequality and corruption. Uncritical acceptance of unemployment as a social norm is an interesting detail to consider in broader conversations about the status of contemporary education systems as institutions serving, either the perpetuation of the status quo, or the promotion of genuine, politically and historically contextualised, socially-engaged, and emancipatory forms of critical thinking.

The prominence of hyper-individualism we see in contemporary Westernised societies also resonates closely with the notion of attribution of individual agency, as a key fundamentally defining feature of conspiratorial thinking. A reduction in ideological individualism, combined with a decreased tendency to erroneously perceive the presence of individual/personal agency, in this sense, looks likely to also have the effect of lowering CTB prevalence more generally. Douglas et al. (2015) argued that the human brain is hard-wired to attribute conscious agency to phenomena where it does not necessarily exist. Conspiratorial thinking is in part defined by this very feature, or more specifically, the tendency to attribute agency for socially malignant outcomes and conditions, to specific individuals or groups of wilful conspirators. While certain individuals undoubtedly benefit greatly from maintaining the status quo of certain existing socio-economic conditions, conspiracy theorists are more likely to perceive such individuals as all-knowing, all-malevolent plotters, rather than, say, fortuitously privileged persons, operating levers of power in an opportunistic and myopic fashion. Rather than any sense of great foresight, insight, or even malice, it is raw and implacable self-interest, in this sense, that is the only necessary and sufficient condition for suitably explaining the behaviour of fortuitously privileged individuals. Ideological individualism, therefore, likely leads to perceptions of inimical everyday conditions in society as the doings of an all-embracing super group of malicious individuals, as opposed to, say, a broader more systemic/structural phenomenon like alienation, as argued by Franz Neumann (Heinz, 2007).

The distinction dialectical materialism helps to illuminate between individual and societal/systemic foci, in this sense, promotes an alternative epistemological and methodological approach to understanding, as well as potentially curbing, the spread of CTB in contemporary societies. The findings presented in this paper suggest that the significant relationship between CTB and education is currently mediated by, but not in any way dependent on, additional social factors. If a lack of interaction between education and important societal factors currently explains a form of conspiratorial thinking that is ultimately on the rise, however, then a reversal of the trend may result from bolstering such interaction via more critically and socially-engaged pedagogies, and a far more rigorous critique of ideological individualism.

## Conclusion

This study was limited to the analysis of only three social factors as control variables. Other theoretically plausible factors were therefore necessarily omitted. The clustering of country labels in the scatter plots presented, for instance, indicate such plausible effects may be regional, geopolitical, or cultural. Further research is needed to more fully explore the relationship between CTB and education, while taking into account additional social factors, as well as more complex multi-level analyses of individuals, institutions and whole societies, including between-entity and between-conspiracy theory approaches. A structural equation modelling approach could yield some valuable insights in this regard. While this study explored broader claims about the social dimension of CBT using a basic logic of mediation, structural equation modelling would enable researchers to estimate multiple direct and indirect effects simultaneously across a wider selection of variables, with a view to constructing an in-depth sociological model of conspiratorial beliefs. The main limitation of the study was the small

sample size. While some interesting insights nonetheless emerged from the analysis, any more complex methods in future studies would benefit from prioritise variables for which a maximal sample size is available.

Relationships between education and conspiratorial thinking can also alternatively be conceptualised in terms of other educational inputs like policies and curricula, or pedagogical processes, as opposed merely to educational outputs like PISA, or indeed any other similar assessments as main dependent variables. Furthermore, it should be noted that PISA results are not typically summed across three dimensions as they were in this study, with reading, maths and science potentially representing entirely separate dependent variables of interest for more fine-grained future analyses. Future studies might also explore a more diverse sample of societies, given that the present study, as dictated by the YouGov poll, was based on a predominantly Anglo-centric/Euro-centric selection of countries.

Given that sociological analyses are typically theory-laden, the discursive claims arising from the analysis of data should be interpreted within the limitations of the philosophical and theoretical frameworks informing the work, namely, a philosophical basis in dialectical materialism, and theoretical/axiological orientation within the paradigm of critical education theory. Nonetheless, in conclusion, several key claims are presented. Overall, the findings challenge the simplistic view that education affects CTB as an isolated factor operating at the level of individual personal traits. Research question 1 sought to test the relationship between CTB and education at the societal, as opposed to individual, level. Accordingly, the pooled country-level data suggests that, as asserted by Heins (2007) and van Prooijen (2017), there is an important collective aspect to conspiratorial thinking, and that primary causal mechanisms underlying belief in conspiracy theories are sociological, as opposed to merely psychological. Research question 2 was focused on how such a relationship might be mediated by additional social factors. In this sense, the findings support the notion that both CTB and education are socially embedded, and that additional social factors do exert a significant mediating effect on their relationship.

Corruption, as defined by CPI, had the strongest and most statistically significant effect of all on CTB. The effect was so strong, in fact, that education failed to perturb it in any way. Indeed, according to the non-significant interaction terms in all three sets of models tested, education did not interact with any of the social factors in exercising a combined effect on conspiratorial thinking. Research question 3 was more closely concerned with these interactions between social factors and educational institutions, in affecting an observable cognitive outcome like conspiratorial thinking. To this effect, the findings ultimately challenge the idea that an impactful form of critical pedagogy is actually taking place in education systems, at least across the countries sampled. Finally, the study highlighted some of the difficulties associated with failing to clearly define critical thinking as a concept, and conceptualising it from a perspective excessively rooted in ideological individualism. Taken to include a broader socially-critical character, compelling questions are raised, about the way we draw conceptual lines between conspiratorial, and non-conspiratorial critical thinking in a politically and ideologically charged socio-economic climate, and furthermore, what this can reveal about the broader role of education in society as a site for the development of critical thinking in its genuine, free, socially-engaged, and emancipatory form.

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