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Making Better Decisions, Eschewing Conspiracy, Populism, and Science Denial: Analysing the Attributes of Individuals Who Engage Effectively with Ideas

Chris Brown *, **Ruth Luzmore and Yin Wang**

Southampton Education School, University of Southampton, Southampton SO17 3QY, UK;
r.e.a.luzmore@soton.ac.uk (R.L.); yin.wang@soton.ac.uk (Y.W.)
* Correspondence: christopher.brown@soton.ac.uk

Abstract: How can we encourage individuals to engage with beneficial ideas, while eschewing dark ideas such as science denial, conspiracy theories, or populist rhetoric? This paper investigates the mechanisms underpinning individuals' engagement with ideas, proposing a model grounded in education, social networks, and pragmatic prospection. Beneficial ideas enhance decision-making, improving individual and societal outcomes, while dark ideas lead to suboptimal consequences, such as diminished trust in institutions and health-related harm. Using a Structural Equation Model (SEM) based on survey data from 7000 respondents across seven European countries, we test hypotheses linking critical thinking, network dynamics, and pragmatic prospection (i.e., a forward-looking mindset) to the value individuals ascribe to engaging with ideas, their ability to identify positive and dark ideas effectively, how individuals subsequently engage with ideas, and who they engage in them with. Our results highlight two key pathways: one linking pragmatic prospection to network-building and idea-sharing, and another connecting critical reasoning and knowledge acquisition to effective ideas engagement. Together, these pathways illustrate how interventions in education, network development, and forward-planning can empower individuals to critically evaluate and embrace positive ideas while rejecting those that might be detrimental. The paper concludes with recommendations for policy and future research to support an ideas-informed society.

Keywords: ideas; social networks; prospection; misinformation; education; ideas-engagement; ideas-informed society

1. Introduction

Ideas matter. Great ideas, if acted on, can enhance decision making, improving lives and communities as a result. For instance, individuals engaging with factual ideas relating to how one can live more healthily may decide to cut down on the amount of alcohol they consume, may choose not to take up vaping, or may decide to increase the amount of physical activity they engage in, so reducing their chances of avoidable cancer [1]. Likewise, prolonged ideas engagement that serves to build one's cultural capital, makes more likely a myriad range of positive outcomes, including better educational attainment, inter-generational social mobility, as well as self-actualisation [2–6]. We refer to these as 'positive ideas'. Conversely, there are those ideas that result in objectively sub-optimal outcomes (these ideas we refer to as 'dark ideas'). In keeping with past studies in this area, [7,8], positive ideas are, thus, formally defined as those ideas based on (1) a robust

and credible evidence base in relation to current or potential new behaviours; (2) a strongly-reasoned argument (or theory of change) that provides this evidence with meaning; (3) a social, moral, or value-based imperative setting out the need for change based on (1) and (2); and (4) buy-in to this imperative from a range of credible stakeholders. This definition means that positive decisions can, thus, be made on the basis of these ideas. For instance, at an individual level: 'one should limit one's alcohol consumption to 14 units a week', or in relation to macro-level challenges such as limiting CO_2 emissions. Conversely then, dark ideas can often be viewed as representing a violation of one or more of (1) to (4) above. For instance, populist leaders, in their promulgation of dark ideas, have traditionally attempted to subvert (1) the notion of a robust and credible evidence base or (2) the theory of change, through the provision of 'alternative facts' or reasoning. They do so, for instance, to suggest that climate change is not happening [9].

Past research has shown that positive ideas are not always taken up by those who might benefit from them most, however. For instance, our own work in this area [10] suggests the presence of tight-knit communities of individuals with lower levels of education and who are unemployed or who work in routine or semi-routine roles. The members of these communities are less likely to see value in ideas-engagement, to engage in activities that provide access to ideas, nor are they likely to discuss news, current affairs, and new societal developments with friends, family, and work colleagues [10,11]. Yet engaging in such ideas could be beneficial. For example, being characterised by lower levels of education and higher rates of manual work, means these communities are often more likely to experience significant economic hardship, bringing about unique challenges. The Centre for Social Justice [12], for example, notes that, following the COVID-19 pandemic, 40 percent of individuals in the UK's most disadvantaged communities report having a mental health condition, in contrast to 13 percent in the general population; while the number of methadone-related deaths has risen by 63 percent in comparison to pre-pandemic figures. Further, severe school absenteeism in these areas has surged by 134 percent, leaving around 140,000 children attending school less often than not. Research indicates that people in deprived areas are also significantly less likely to participate in cultural capital-building activities, despite the role of cultural capital in promoting social equity [3]. Thus, while fostering ideas engagement alone may not address the systemic issues driving social and economic hardship, such activity could empower individuals in disadvantaged communities with the knowledge and agency needed to address these and other pressing challenges.

On the other hand, we have seen—particularly in more recent times—a growing circulation of dark ideas, including those centred on conspiracy, science denial, or emotionally manipulative populism. Exacerbated by the post-truth environment catalysed by Web 2.0 [13], the result of individuals and societies cleaving to dark ideas like these has resulted in health-related harm (e.g., a decline in the take up of life-saving vaccines, while the take up of alternative medicine is on the rise [14,15]), social unrest (e.g., the Capitol Hill insurrection in the US, immigration riots in the UK, and the recently uncovered plot to overthrow legitimate democracy in Germany by the Reichsbürger movement: e.g., see [16–18]), as well as a decline of trust in governments, and state and public institutions (including institutions such as universities, the judiciary, and public service broadcasting: e.g., see [19]). Recent studies also point to a range of factors which may impact whether one is more likely to believe in dark ideas. For example, Feinstein and Baram-Tsabari [20] draw on the notion of the 'epistemic network' as a heuristic for examining how and under what circumstances scientific beliefs spread from one person to another, how one person's or group's beliefs affect the beliefs of those around them and how discredited science might continue to spread, even after it has been debunked. The same notion also holds for the development of political polarisation [21]. In both situations,

there is the subsequent and real risk of infodemics occurring as a result of the large-scale spread of false information via networks, leading to confusion and mistrust of authorities [22]. Other studies highlight the high potential for social media to seed misinformation into networks while accelerating its spread [23–25]. Correspondingly, it is suggested that infodemics may be more likely to occur amongst young people who are both less likely to turn to traditional news outlets; with their access to the news more likely to be mediated by opinion formers within their social networks [14,22].

Further explanation is provided by the term crippled epistemology, which *refers* to a cognitive state in which individuals advocating conspiracy theories lack an understanding of how genuine knowledge is constructed [26]. Epistemic beliefs—an individual's perceptions about the nature of knowledge and knowing—shape how people acquire, evaluate, and validate information [27]. When individuals suffer from crippled epistemology, their endorsement of conspiracy theories may appear rational from their perspective, since they lack the ability to triangulate and verify evidence and critically assess truth claims [28]. As Sunstein and Vermeule [26] explain, conspiracy theorists often rely on systematically limited or biased informational sources, leading them to interpret misleading signals as credible [27]. This issue is exacerbated by contemporary digital environments, where selective exposure and confirmation bias create misinformation echo chambers [29]. Without mechanisms for effective ideas engagement—such as critical reasoning and idea and network diversity—individuals become trapped in epistemic isolation, further reinforcing their belief in misinformation and conspiratorial thinking [30]. The consequences of crippled epistemology are evident in contemporary controversies, such as vaccine scepticism and climate change denial, where epistemic networks systematically exclude corrective information, making conspiracy beliefs more persistent [31,32]. Encouraging effective ideas engagement through exposure to diverse viewpoints and critical reasoning, therefore, offers a potential intervention against such epistemic entrenchment [30].

1.1. Purpose

Engaging with ideas can, thus, in theory, empower citizens to become more informed, make better decisions, and deepen their understanding of the world around them. However, these benefits do not reach everyone—especially in those communities which might benefit most from active engagement with ideas. In the broader ecosystem of ideas, the lack of citizens equipped to critically evaluate ideas can allow harmful or misleading concepts to gain traction, leading to less desirable outcomes for both individuals and society. In our own work [8], we have previously posited the existence of a framework of three factors affecting whether individuals see value in engaging with ideas as well as influence how (and how effectively) individuals engage with ideas (and so the likely outcome of that engagement). Specifically, our model seeks to account for the presence or absence of ideas engagement in individuals and communities and to explain why certain populations may gravitate toward misguided beliefs [8]. This prior work was, principally, a theoretical proposition, albeit one based on various strands of substantive research (including the development of a Structural Equation Model (SEM), using data from a survey 1000 UK-based adult citizens [10], a systematic review [33], and a randomised control trial [34]. Building on this theoretical development, the purpose of this paper is to report on empirical analysis designed to test the veracity of our theoretical frame. Specifically, we explore our whether assumptions underpinning our model serve to explain ideas engagement. To this end, we present a SEM developed from a sample of 7000 adult respondents from seven European countries.

1.2. Perspectives

Our aforementioned framework posits the role of three factors in shaping effective ideas engagement. These are: (1) the level of education and its capacity to equip people with critical thinking skills; (2) the structure and nature of individuals' social networks, which influence access to ideas; and (3) whether individuals hold a forward-looking mindset, which can foster a commitment to ideas with far-reaching, positive impacts. For instance, previous research [10,33] has demonstrated that the first of these factors—level of education—positively correlates with the value individuals place on engaging with ideas. This is because education enhances critical engagement [35], as it provides both general knowledge gained from compulsory schooling and specialised knowledge from higher education, both of which support critical thinking, while promoting more sophisticated epistemic beliefs [27,36]. Education, therefore, supplies the context and conceptual framework necessary for critical engagement with new ideas. For example, understanding the scientific method and evidence supporting the Earth's shape allows one to critically evaluate flat-earth theory. Similarly, specialised knowledge facilitates more efficient and accurate judgment [37]. Moreover, higher education significantly fosters one's disposition to engage in critical thinking as well as arm individuals to do so [38–40]. As the aim of our framework is to explain whether individuals see value in engaging with ideas as well how (and how effectively) they engage with ideas, the role of education within it enables us to posit the following three hypotheses:

Hypothesis 1 (H1). *An individual's education has a significant positive effect on the value they place on engaging with ideas.*

Hypothesis 2 (H2). *An individual's education has a significant positive effect on whether they actually seek out and engage with ideas.*

Hypothesis 3 (H3). *An individual's education has a significant positive effect on whether they can identify positive and dark ideas effectively.*

The second element of our framework—social networks—represent collections of individuals connected through specific ties, whether these be face-to-face or via social media [41]. These networks facilitate the flow of resources—including ideas, knowledge, trust, and inspiration [11]. Factors shaping the availability and access to these resources include whether the properties of a given network encourage to individuals actively engage in idea-sharing with other network members [41,42]. Also vital is the degree of familiarity and trust within a network which create the conditions for sharing with other network members [41,43–45]. The inclusion of social networks within our framework results in the hypotheses H4 to H6:

Hypothesis 4 (H4). *The characteristics of an individual's social network have a significant and positive effect on the value they place on engaging with ideas.*

Hypothesis 5 (H5). *The characteristics of an individual's social network have a significant and positive effect on whether individuals actually seek out and engage with ideas.*

Hypothesis 6 (H6). *The characteristics of an individual's social network have a significant and positive effect on whether they can identify positive and dark ideas effectively.*

Finally, the last element of our framework—pragmatic prospection—involves contemplating future choices and actions to achieve desired outcomes [46]. This approach encourages "thinking about the future in ways that will assist in producing desired outcomes and avoiding undesired ones" [47] (p. 4). Prospection can be developed to support better, forward-looking decisions [48]. For instance, a recent study [34] used a four-week intervention with 515 UK adults to stimulate prospective thinking, resulting in a significant increase in respondents recognizing the value of staying current with new ideas. This result was attributed to the fact that individuals with a forward-looking focus are more likely to realize that, to be successful, their plans are likely to require a foundation informed by constructive ideas [49]. The inclusion of pragmatic prospection in the framework results in three final hypotheses (H7 to H9):

Hypothesis 7 (H7). *An individual's ability to engage in pragmatic prospection has a significant positive effect on the value they place on engaging with ideas.*

Hypothesis 8 (H8). *An individual's ability to engage in pragmatic prospection has a significant positive effect on whether individuals actually seek out and engage with ideas.*

Hypothesis 9 (H9). *An individual's ability to engage in pragmatic prospection has a significant positive effect on whether they can identify positive and dark ideas effectively.*

A diagram of our theoretical framework is provided in Figure 1 below, with dotted lines representing further possible but unconceptualized connections among these variables. For a fuller discussion of each element of our framework and its ties to ideas-engagement, we refer you to Brown and Luzmore [8].
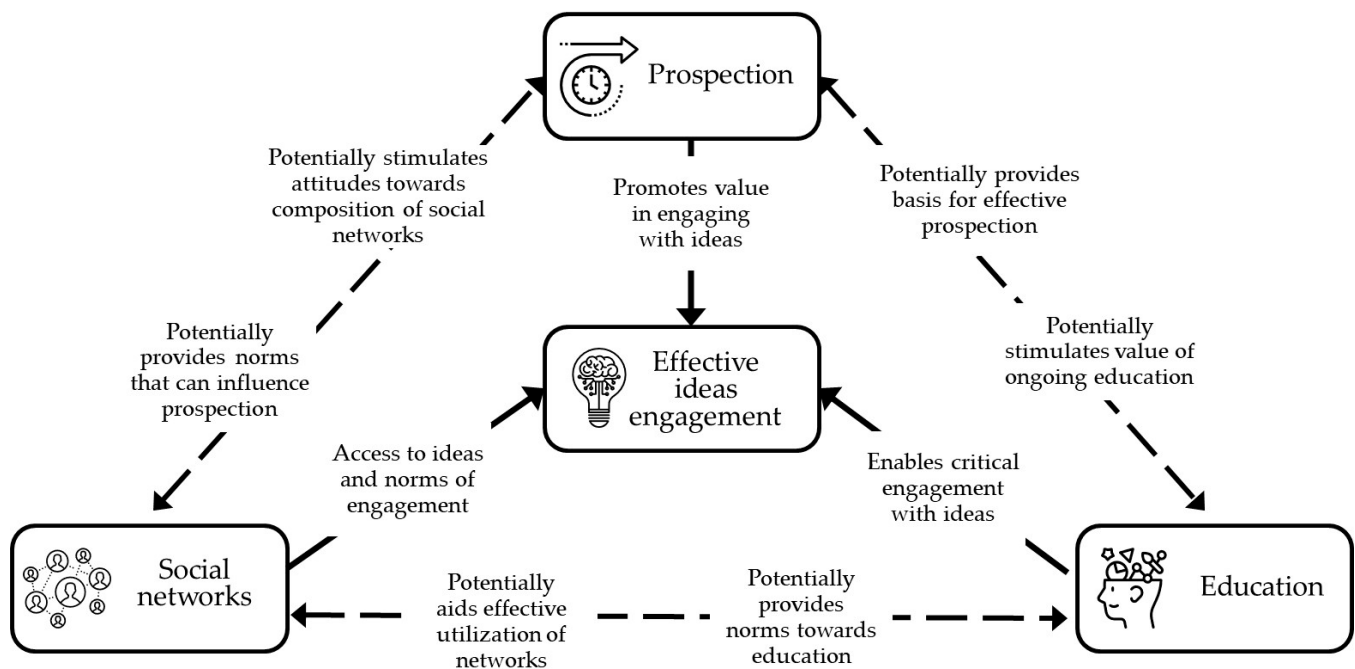
Figure 1. Theoretical frame for ideas-engagement.

2. Materials and Methods

To empirically test our theoretical model, we began by operationalising it via the development of a questionnaire (the 'Ideas Networks Prospection and Education Survey (INPES)'). Survey items were constructed for each variable corresponding to the four key components of the framework: ideas engagement, education, social networks, and pragmatic prospection, along with relevant demographic variables (age, gender, household income, ethnic origin, region, and occupation) [50]. The full theoretical framework by Brown and Luzmore [8] includes 15 variables: five for ideas engagement, two for education, seven for social networks, and one for prospection (see Table 1, below). Notably, a key update from previous analyses, e.g., ref. [34], is that we expand our approach to measuring ideas engagement (IE1–5), differentiating between the types of ideas that individuals might value. For instance, we distinguish between activities that could be seen as "ideas engagement for its own sake" (IE1) from those with a more immediate effect on one's quality of life, or "instrumental ideas engagement" (IE2). This separation enables us to assess whether certain needs or motivations for ideas engagement align more or less well with aspects of prospection, education, or social networks. Additionally, we introduced a calibration element, asking respondents to assess the veracity of statements that were either factual, conspiratorial, or false but populist. For instance, respondents were asked to rate the truth of statements like "there is evidence to suggest the Earth is actually flat, rather than round" (factually incorrect). This was intended to help us distinguish between respondents engaging valid ideas versus "dark" ideas and to explore whether engagement with valid ideas also corresponded to respondents rejecting dark ideas—or if respondents could engage with both.

A detailed list and descriptions of all variables are in Table 1, and finalised survey items and response options for the 15 variables are in Table A1, Appendix A. In developing our questionnaire, we reviewed whether scales and items already existed for each of our variables, incorporating previously tested measures wherever possible. For example, we adopted prospection measurement items previously developed by Ruscio et al. [51]. Appendix A (Table A1) indicates, for each variable, whether we used existing items or developed new ones. Following best practice [52], two experts reviewed the questionnaire for face and content validity, and two laypersons tested it for clarity to identify any potential ambiguities. A pilot study with 100 respondents in each of the seven countries was also undertaken to confirm that questions were clear and effectively interpreted by respondents.

Table 1. Variables corresponding to the theoretical framework for ideas-engagement.

Aspect of Framework	Label	Variables	Description	Factor Solution	New Factor Names Where Applicable
Ideas engagement	IE1	Value of ideas-engagement [keeping well-informed]	The value respondents place on keeping themselves well-informed. For example, by finding out more about different ideas or perspectives; learning more about scientific discoveries and new technology; and/or discovering more about different aspects of history and culture (including arts, literature, etc.).	n/a	n/a
Ideas engagement	IE2	Value of ideas-engagement [staying up-to-date with current affairs]	The value respondents place on staying up to date with current affairs. For example, by staying abreast of political and economic events; keeping up to date with sport; engaging with health-related developments; finding out more about new products, services or forms of media/social media; and/or maintaining an overview of the news generally.	n/a	n/a
Ideas engagement	IE3	Seeking out ideas	The frequency with which respondents seek out ideas (e.g., via accessing media or other content, or by engaging in activities such as attending lectures or museum exhibitions).	Three emerging from the exploratory factor analysis (EFA)	Active in-person idea engagement (question items 11 to 14) Traditional consumption of ideas (question items 1 and 2) Digital exploration of ideas (question items 8 to 11)
Ideas engagement	IE4	Reasons for how ideas are sought out	Why respondents choose to access ideas via identified content/media/channels, or to engage in certain activities (such as attending lectures or museum exhibitions).	Excluded from further analysis	n/a
Ideas engagement	IE5	Able to identify positive and dark ideas effectively	The extent to which respondents consider to be true statements which are factual, based on conspiracy theory and/or are populist in nature.	Two emerging from confirmatory factor analysis CFA	Ability to identify positive ideas correctly (question items 1, 3, 4, and 9) Ability to identify dark ideas correctly (question items 2, 6, 8, 10 and 11)

Table 1. *Cont.*

Aspect of Framework	Label	Variables	Description	Factor Solution	New Factor Names Where Applicable
Education	ED1	Level of education	Respondents' highest level of qualification	n/a	n/a
Education	ED2	Ability to think critically	Whether respondents are able to engage critically with the ideas they encounter.	One (emerging from CFA)	Critical thinking and engagement (question items 2, 3, 6, 8, 9, 14)
Networks	NW1	Network size	The size of respondents' social network: represented by the number of people they are connected to.	One (emerging from EFA)	All question items
Networks	NW2	Ideas network centrality [keeping well-informed]: how many people respondents discuss ideas with	The number of people within a social network with whom respondents directly engage in ideas-related discussion (specifically, discussion relating to respondents keeping themselves well-informed).	One (emerging from CFA)	All question items
Networks	NW3	Ideas network centrality [keeping well-informed]: how often respondents discuss ideas with social connections	The frequency with which respondents directly engage in ideas-related discussion with social connections (specifically discussion relating to respondents keeping themselves well-informed).	One (emerging from the EFA)	Keeping informed networks frequency (all question items)
Networks	NW4	Ideas network centrality [staying up-to-date with current affairs]: how many people respondents discuss ideas with	The number of people within a social network with whom respondents directly engage in ideas-related discussion (specifically discussion relating to respondents staying up-to-date with current affairs).	One (emerging from the EFA)	Current affairs networks discussion (all question items)
Networks	NW5	Ideas network centrality [staying up-to-date with current affairs]: how often respondents discuss ideas with social connections	The frequency with which respondents directly engage in ideas-related discussion with social connections (specifically discussion relating to respondents staying up-to-date with current affairs).	One (emerging from the EFA)	Current affairs networks Frequency (all question items)

Table 1. *Cont.*

Aspect of Framework	Label	Variables	Description	Factor Solution	New Factor Names Where Applicable
Networks	NW6	Ideas network ties [weak or strong]	The openness of respondents to engaging with individuals who can provide opportunities to receive new ideas, perspectives, or offer challenges to existing beliefs.	Excluded from the analysis	n/a
Networks	NW7	Network grouping/density	Whether respondents' social network is defined by high levels of familiarity, community and trust which can limit the inflow of new ideas into the network.	Two (emerging from the EFA)	(1) Network homophily (question items 1, 8, 9, and 10) (2) Network social capital (question items 5, 6, 7)
Prospection	PR1	Whether respondents possess a prospective mindset	Whether individuals think about the future in ways that will enable them to achieve desired future outcomes, while avoiding undesired ones.	Two (emerging from CFA)	Imagining future outcomes and adaptive planning (question items 1, 3, 6, 11, 12, 16, 18)

Data Sources

To gather data for our study, we replicated the approach previously used by Brown et al. [10] to explore ideas engagement in England. Specifically, we used a panel provider to collect survey data from nationally representative samples of 1000 citizens, this time from seven European countries (providing a sample of 7000 citizens in total). Given their strong network of bespoke panel services across Europe, we selected Bilendi as our provider, who recruit panel members through a variety of online channels, including:

1. Search engine optimisation (SEO) to attract organic traffic
2. Pay-per-click advertising
3. Online display ads
4. Direct email outreach
5. Social media ads
6. Collaborations with social influencers
7. Brand loyalty programs

To participate in surveys, Bilendi members create accounts and provide detailed socio-demographic information, ensuring that surveys are appropriately targeted. Panellists can receive survey invitations up to three times daily, and in return for completing surveys, they earn points exchangeable for products. Participation is voluntary, and if a member opts out of a survey, an equivalent replacement is contacted.

Having previously focused on England, and acknowledging that our framework might have the potential to be England-centric, we aimed to also include within our analysis comparator countries with potentially different perspectives, essentially "stress testing" our framework. We approached this selection by examining findings from the Minkov-Hofstede model of culture [53], which builds on Hofstede's earlier work [54,55]. This model identifies two core cultural dimensions present across 102 surveyed countries: individuality (vs. collectivism) and long-term (vs. short-term) orientation. These dimensions are strong predictors of national indicators such as educational attainment, political and economic freedoms, gender equality, digital adoption, and innovation, even when controlling for national wealth and other cultural factors. For example, countries high in individuality prioritise personal freedom, rights, and independent thinking, encouraging the challenging of conventional ideas. In contrast, collectivist societies enforce strict social norms, discourage deviation, and often view innovative thinking as breaking tradition. Individualist societies tend to have loosely defined in-groups, while collectivist ones foster tightly knit networks [53]. Meanwhile, countries with a long-term orientation encourage delayed gratification, self-reliance, and restraint, whereas those with a short-term orientation prioritise immediate generosity and sharing over saving (ibid). Viewed through the lens of our theoretical framework, these cultural dimensions could intuitively affect whether individuals have diffuse or dense social and idea-access networks, the type of education available within a country (and to whom), the level of education that citizens might attain, the likelihood of a future-focused mindset, and, ultimately, whether ideas engagement is valued. Considering (1) the diversity in individuality and time orientation between England and other nations and (2) the availability of countries with accessible samples through Bilendi within our budget, we identified six additional countries to include within our study: Finland, Italy, the Netherlands, Spain, Sweden, and Switzerland. In Table 2, below, we present the individuality and time orientation scores for each country, alongside England's, based on Minkov and Kaasa's 2022 analysis [53]. The variation in these scores across our selected countries offers a strong initial test for identifying any limitations within our framework.

Table 2. The position of our sample countries based on the Minkov-Hofstede model of culture.

Country	Score for Individuality vs. Collectivism	Score for Long Term vs. Short-Term
England (UK)	93	56
Finland	88	71
Italy	5	−36
Netherlands	182	87
Spain	58	2
Sweden	133	21
Switzerland	105	−21

Our original survey was translated by professional translators working at Bilendi into Dutch Finnish, Italian, Spanish, Swedish and, for our Swiss sample, German and French (with additional translators assessing for accuracy and meaning of the text). Further changes were made in relation to demographic questions, such as income (where income bands and units of currency were modified for each country), as well as for geographic region and level of education (again, with changes reflecting country context).

Online recruitment panels introduce potential biases due to self-selection, where digitally connected and incentive-motivated participants are over-represented. To mitigate these issues, specific quotas were set to target the general population with nationally representative (non-interlocked) quotas on age, gender, and geographic regions, along with soft quotas on social grade and education. Correspondingly, following an initial pilot of the questionnaire with 100 participants from each country, so as to enable the research team to assess whether survey questions were being interpreted correctly, Bilendi subsequently distributed our survey to nationally representative samples of 1000 citizens (aged 18+) from across each of England, Finland, Italy, the Netherlands, Spain, Sweden and Switzerland. Surveys were administered in July 2024. Final survey data was representative within a maximum 5 percent −/+ variation) for each country and the data provided by Bilendi was weighted to account for any variation that might occur based on age, gender, socio-economic group, and geographic region.

3. Results

Analysis

This study utilised a multi-step process that combined exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modelling (SEM) to examine the hypothesised relationships between latent constructs. This approach allowed us to: (a) develop a measurement model to establish the significance and size of the effect of the relationship between exogenous and endogenous variables, thus, facilitating hypothesis testing; (b) test models with multiple dependent and independent variables and multiple chains of cause and effect [50,56]. This is especially useful since, as is also reflected in Figure 1, while we are interested in direct relationships between education, social networks, pragmatic prospection, and ideas engagement, potential chains of cause and effect may also exit between the three components of education, social networks, and pragmatic prospection. For example, prospection potentially affects attitudes towards' one's social networks and education. Finally, our approach enabled us to (c) assess model fit for entire models, bringing a higher-level perspective to the analysis. In other words, SEM enables us to go beyond the testing of individual hypotheses to examine whether the model or framework, in its entirety, should be accepted, rejected, or modified [50]. Correspondingly, this approach enables an assessment of whether a given model makes theoretical sense as well as whether they have a good statistical correspondence to the data.

The process began with an EFA to reduce the dimensionality of the observed variables associated with the latent constructs in the categories of Networks (see Table 1, value labels NW1, NW3 to NW5, and NW7) and Idea Engagement (see Table 1, value labels IE3 and IE4) [57]. Polychoric correlations were calculated to address the ordinal data, and the principal factor method was used for extraction [58]. Based on scree plot analysis and the identification of eigenvalues greater than one, two factors were retained for Networks, sourced from NW7. These factors were labelled: 'Network Homophily' and 'Network Social Capital.' Additionally, three more factors (NW3, NW4, and NW5) were retained, but subsequently considered processes related to Idea Engagement. These factors were renamed as follows: 'Keeping Informed Networks Frequency,' 'Current Affairs Networks Discussion,' and 'Current Affairs Networks Frequency.' Furthermore, three factors were derived from IE3 and renamed 'Active In-Person Engagement with Ideas,' 'Traditional Consumption of Ideas,' and 'Digital Exploration of Ideas.' However, two multi-coded variables, IE4 and NW6, produced an excessive number of factors (with unclear distinctions), which limited their utility in simplifying the model. Thus, these variables were excluded from further analysis and retained only for descriptive statistics, summarizing their characteristics and distributions within the sample (these are reported in [59]).

Following the dimensionality reduction achieved through EFA, CFA was conducted to refine the factor structure and select the most appropriate observed variables for each latent construct. The goal of the CFA was, thus, to evaluate the theoretical consistency and statistical validity of the factors identified in the EFA. This process ensured that only variables with relatively strong and significant factor loadings were included in the subsequent SEM, thereby improving the overall fit of the SEM model. Correspondingly, 'Traditional Consumption of Ideas', 'Digital Exploration of Ideas', and 'Network Size' (NW1), needed to be excluded from the model due to lower standardised factor loadings, reflected in their lower standardised coefficients (see Table A2, Appendix B for the CFA results). Within the latent construct of Education (ED2), questions 1, 4, 5, 7, 10, 11, 12, 13, 15, and 'Level of education' demonstrated lower factor loadings and were excluded, while other items met the necessary threshold. For the Prospection construct, questions 4, 5, 7, 8, 9, 10, 13, 14, and 17 were not included due to weaker factor loadings, and questions 2 and 15 were also excluded to enhance model fit in the SEM model test. Finally, for the item IE5: 'Able to identify positive and dark ideas effectively', questions 5, 7, and 12 were excluded because their factor loadings were below 0.3. The removal of weaker items contributed to improved fit indices for the SEM model. Additionally, 'Ideas network centrality [keeping well-informed]: how many people respondents discuss ideas with' (NW2) was excluded due to high correlations (0.8) with other variables of 'Keeping Informed Networks Frequency' (NW3), 'Current Affairs Networks Discussion' (NW4), and 'Current Affairs Networks Frequency' (NW5), enabling us to mitigate multicollinearity and enhance model parsimony.

After refining the factor structure, SEM was employed to explore the relationships between the latent constructs. The SEM framework allowed for simultaneous testing of direct and indirect effects among Idea Engagement (Value of ideas-engagement, Active In-Person Idea Engagement, Keeping Informed Networks Frequency, Current Affairs Networks Discussion, Current Affairs Networks Frequency), Networks (Network Homophily, Network Social Capital), Prospection (Imagining Future Outcomes and Adaptive Planning), Education (Critical thinking and engagement), and ability to identify Positive Ideas and Dark Ideas correctly. The model incorporated bootstrap sampling (2000 iterations) to generate robust standard errors and confidence intervals for the parameter estimates [60]. Standardised estimates and bootstrap confidence intervals provided insights into the strength

and significance of hypothesised paths, allowing for a comprehensive evaluation of the constructs' interactions.

The final model is summarised in Table 3 and depicted in Figure 2. The path analysis results offer a comprehensive understanding of the relationships among the constructs in the model, with all path coefficients found to be statistically significant ($p < 0.001$). To help identify different strengths of influence [61] path coefficients in Figure 2 have been colour-coded as set out in Table 4:

Table 3. Path model standardised statistics.

Latent Variable	Observed Variable	Estimate	S.E.	Est./S.E.	*p*-Value
Ideas Engagement	Keeping Informed Networks Frequency	0.92	0.003	261.604	0.00
	Current Affairs Networks Discussion	0.90	0.003	271.431	0.00
	Current Affairs Networks Frequency	0.95	0.003	322.64	0.00
	Active In-Person Engagement with Ideas	0.52	0.01	49.976	0.00
Network	Network Homophily	0.56	0.01	53.796	0.00
	Network Social Capital	0.96	0.013	73.695	0.00
Critical thinking and engagement	Q2	0.68	0.01	67.536	0.00
	Q3	0.71	0.01	70.437	0.00
	Q6	0.63	0.01	63.07	0.00
	Q8	0.63	0.011	57.717	0.00
	Q9	0.71	0.009	75.284	0.00
	Q14	0.56	0.011	49.48	0.00
Imagining Future Outcomes and Adaptive Planning	Q1	0.57	0.012	48.575	0.00
	Q3	0.63	0.011	57.545	0.00
	Q6	0.58	0.012	49.447	0.00
	Q11	0.63	0.011	58.676	0.00
	Q12	0.61	0.012	51.497	0.00
	Q16	0.64	0.011	55.57	0.00
	Q18	0.59	0.011	53.988	0.00
Ability to identify dark ideas correctly	Q2	0.39	0.014	28.075	0.00
	Q6	0.44	0.013	32.712	0.00
	Q8	0.69	0.013	53.335	0.00
	Q10	0.59	0.012	48.532	0.00
	Q11	0.60	0.013	44.345	0.00
Ability to identify positive ideas correctly	Q1	0.54	0.015	34.988	0.00
	Q3	0.46	0.018	25.567	0.00
	Q4	0.51	0.017	29.903	0.00
	Q9	0.39	0.016	25.337	0.00
Path Analysis		**Estimate**	**S.E.**	**Est./S.E.**	***p*-Value**
Networks on Imagining Future Outcomes and Adaptive Planning		0.15	0.017	8.759	0.00
Critical Engagement and Thinking on Imagining Future Outcomes and Adaptive Planning		0.59	0.015	39.385	0.00
Idea Engagement on Imagining Future Outcomes and Adaptive Planning		0.05	0.013	3.824	0.00
Idea Engagement on Networks		0.62	0.012	50.817	0.00

Table 3. *Cont.*

Latent Variable	Observed Variable	Estimate	S.E.	Est./S.E.	*p*-Value
Ability to identify dark ideas correctly on Critical Engagement and Thinking		0.35	0.018	19.653	0.00
Ability to identify positive ideas correctly on Critical Engagement and Thinking		0.54	0.018	29.422	0.00
Idea Engagement on Value of ideas-engagement		0.16	0.01	15.58	0.00
Value of ideas-engagement on Critical Engagement and Thinking		0.33	0.013	24.595	0.00
Ability to identify positive ideas correctly with Ability to identify dark ideas correctly		0.36	0.027	13.367	0.00

Model Fit Information	Estimate	S.E.		
Number of Free Parameters	95.00			
Information Criteria				
Akaike (AIC)	499,259.25			
Bayesian (BIC)	499,911.31			
Chi-Square Test of Model Fit				
Value	6443.90			
Degrees of Freedom	369.00			
p-Value	0.00			
RMSEA				
Estimate	0.05			
90 Percent C.I.	0.05	0.049		
Probability RMSEA <= 0.05	1.00			
CFI/TLI				
CFI	0.91			
TLI	0.90			

Table 4. Correlation strength colour coding for SEM.

Correlation Strength	Description	Colour
Strong	($|$coefficient$|$ > 0.5): Indicates a significant and strong influence	Black
Moderate	($0.3 \leq |$coefficient$| \leq 0.5$): Indicates a moderate level of influence	Green
Weak	($|$coefficient$|$ < 0.3): Indicates a weak influence between variables	Red

The model achieved acceptable fit indices, including RMSEA = 0.048, CFI = 0.911, and TLI = 0.902, with a chi-square test value of 6443.90 (df = 369, $p < 0.001$). These fit statistics confirm the theoretical soundness and statistical validity of the model in relation to the data, providing a robust framework for testing the hypotheses and understanding the complex interactions between the constructs [62,63]. The results of the hypothesis testing based on our path statistics and can be found in Table 5.
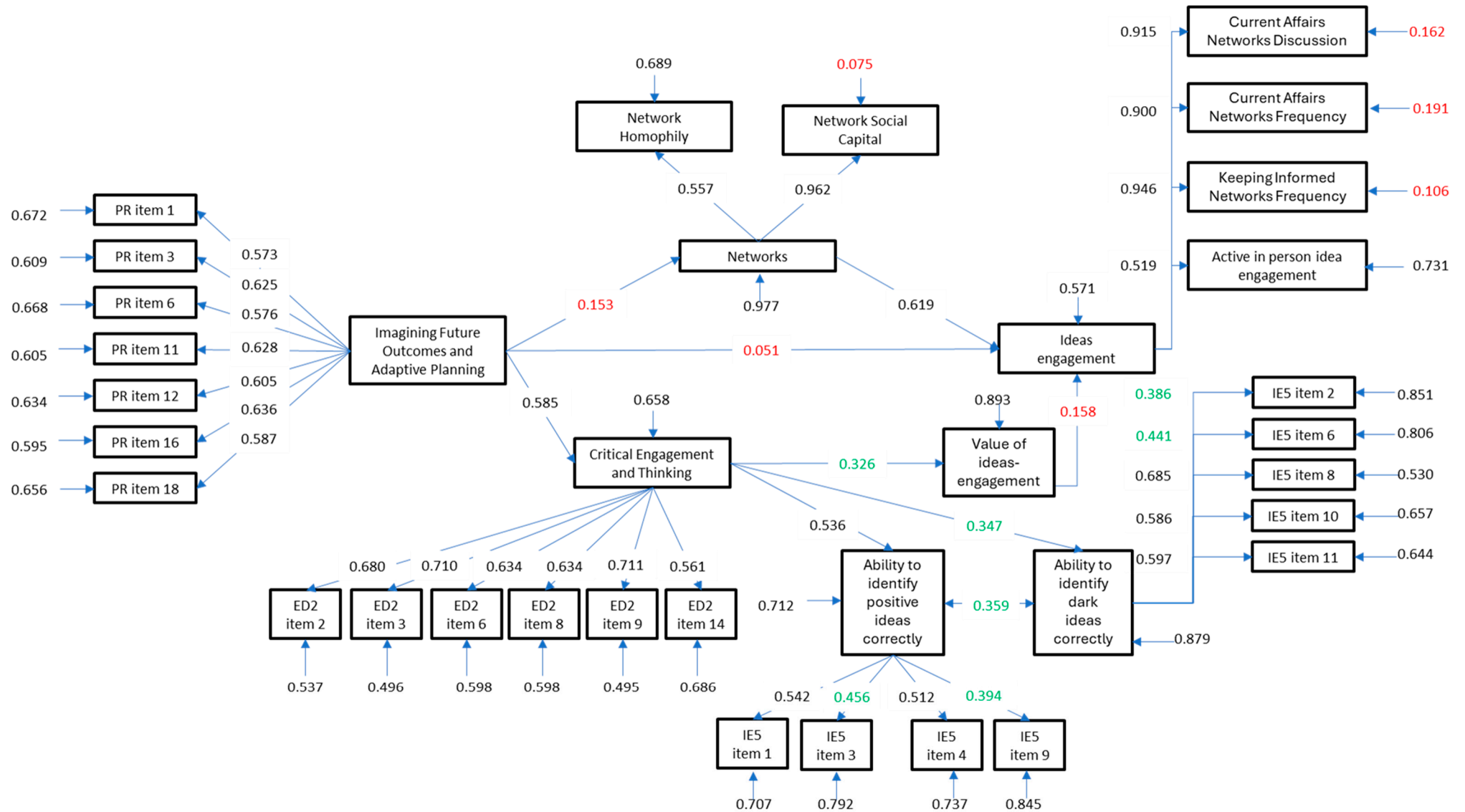
Figure 2. The final SEM model for ideas-engagement.

Table 5. Results of the hypothesis testing.

	Hypothesis	Supported	Evidence
H1	An individual's education has a significant positive effect on the value they place on engaging with ideas	Supported	Significant pathway between 'Critical Engagement and Thinking' and 'Value of ideas-engagement'.
H2	An individual's education has a significant positive effect on whether they actually seek out and engage with ideas	Supported	Significant pathway between 'Critical Engagement and Thinking' and 'Ideas engagement' via 'Value of ideas-engagement'.
H3	An individual's education has a significant positive effect on whether they can identify positive and dark ideas effectively	Supported	Significant pathway between 'Critical Engagement and Thinking' and both 'Ability to identify positive ideas correctly' and 'Ability to identify dark ideas correctly'.
H4	The characteristics of an individual's social network have a significant and positive effect on the value they place on engaging with ideas	Not supported	No significant pathway found.
H5	The characteristics of an individual's social network have a significant and positive effect on whether individuals actually seek out and engage with ideas	Supported	Significant pathway between 'Networks' and 'Ideas Engagement'
H6	The characteristics of an individual's social network have a significant and positive effect on whether they can identify positive and dark ideas effectively	Not supported	No significant pathway found.
H7	An individual's ability to engage in pragmatic prospection has a significant positive effect on the value they place on engaging with ideas	Supported	Significant pathway between 'Imagining Future Outcomes and Adaptive Planning' and 'Value of ideas-engagement' via 'Critical Engagement and Thinking'.
H8	An individual's ability to engage in pragmatic prospection has a significant positive effect on whether individuals actually seek out and engage with ideas	Supported	Three significant pathways between 'Imagining Future Outcomes and Adaptive Planning' and 'Ideas Engagement': (1) direct pathway; (2) pathway via 'Networks'; and (3) pathway via 'Critical Engagement and Thinking' and 'Value of ideas-engagement'.
H9	An individual's ability to engage in pragmatic prospection has a significant positive effect on whether they can identify positive and dark ideas effectively	Supported	Significant pathway between 'Imagining Future Outcomes and Adaptive Planning' and both 'Ability to identify positive ideas correctly' and 'Ability to identify dark ideas correctly' (via 'Critical Engagement and Thinking').

4. Discussion

Our results indicate a model that is structurally coherent (i.e., that fits the data), whilst also comprised of relationships that boast meaningful effect sizes. Vitally, the model also makes sense from a theoretical perspective: crucial since our analysis aimed to test a newly developed theoretical frame. While grounded in previous research and literature, this

framework is novel and original and, as such, has not yet been explored in a comprehensive manner. From the results above it is clear that, while some of the original hypotheses do not hold (H4 and H6), and although some of the pathways which comprise the final model were not those originally envisaged, it is indeed the case that effective ideas-engagement is a function of elements of education, social networks pragmatic prospection. What's more, these elements combine to facilitate ideas engagement in two ways. On one hand, the model identifies a path that links pragmatic prospection, first to relationship building with those with whom individuals share common social identities and affiliations; then to individuals actively engaging with ideas (pathway 1). This pathway, thus, illustrates that, when individuals possess a mindset attuned to identifying and achieving goals, this positively influences their alignment with networks and communities that can support these goals. This is because shared beliefs, values, and interests foster collaboration, trust, and motivation, making it easier to navigate obstacles and achieve desired outcomes. In turn, belonging to a network of individuals with a shared identity creates a foundation for the meaningful exchange of ideas: being part of a likeminded community or group increases the likelihood of frequent discussions in relation to topics that matter, as well as the seeking out of ideas from different sources. Ultimately such exchanges can provide feedback, knowledge resources, and inspiration: this, thus, links back to pragmatic prospection, since these exchanges can potentially influence progress towards goal achievement. As such, the mediating effect (effect size = 0.619) of individuals belonging to networks typified by homophily and strong social capital, is that of a driver for ideas engagement amongst those who are future-focused.

On the other hand, our model also identifies a path (pathway 2) that connects pragmatic prospection to the sourcing, sharing, and development of ideas through social interaction. This occurs via the mediating variables: (a) critical thinking, (b) the correct identification of dark and positive ideas, and (c) acquiring knowledge to develop one's understanding. Specifically, pragmatic prospection first leads to individuals being more able to source and engage critically with ideas. This is because effective goal setting requires individuals to both be able to source relevant knowledge and possess the critical reasoning skills needed for option evaluation: enabling them to make informed decisions and refine plans. Being able to source knowledge and engage in critical reasoning means individuals can subsequently distinguish more readily between positive and dark ideas. However, it also leads to individuals valuing an engagement with ideas. This is because such abilities naturally lead to the pursuit of self-education and knowledge acquisition, as individuals strive to build a well-informed perspective. Finally, the desire to learn and be well-informed leads to a willingness to actively engage with (e.g., by going to a gallery or museum), share, and discuss knowledge with others, fostering intellectual exchange and collaboration. This second path, thus, illustrates how pragmatic prospection facilitates an effective engagement with ideas: i.e., a situation where individuals both desire to and are able to identify and pursue positive ideas (those that will be beneficial or best serve their goals), while facilitating a capacity to eschew dark ideas. Further, this effective engagement again links back to pragmatic prospection, since it makes it more likely that individuals will achieve the goals they are pursuing.

A few of the elements present within these two pathways cohere with the findings of previous studies: for example, that being able to engage in critical reasoning means individuals can more readily identify positive and dark ideas [36,64]; or that shared beliefs, values, and interests foster collaboration, trust, and motivation (e.g., see [44,45]). Our model adds both originality and significance, however, by placing these individual relationships within wider chains of cause and effect, which serve to link pragmatic prospection to ideas engagement. Likewise, it highlights the importance of each of the elements within the chain,

if ideas-engagement is to be meaningful and effective. For instance, individuals can also, of course, join communities with which they share social identities and affiliations without a predisposition for goal setting. For instance, when constructing the model and exploring individual pathways, we identified a strong significant direct link between networks and ideas engagement (e.g., frequency and breadth of discussion: effect size = 0.64). Without a goal-focused outlook on the part of individuals, however, a number of potential risks emerge. In particular, individuals may be less able to identify whether the ideas their fellow network members engage with are either positive or dark. When constructing our model, for example, we found that, when considering network membership in isolation, this had only a small significant effect on whether individuals could identify either positive ideas or dark ideas correctly, with the size of this effect the same size for both types of idea (0.11 in comparison to the effect sizes of 0.536 and 0.347 when education acts as a mediating variable). As such, when networks alone drive ideas-engagement, there exists more potential for the spread of fake news and misinformation, science denial, conspiracy, and populist views. This can occur, for instance, when individuals place misguided levels of trust in the views of others, simply because they share similar views on certain areas [20,21]. For instance, shared political views may lead individuals to trust the advice of network connections in other areas, such as the safety of vaccines: e.g., see [65].

Furthermore, while our data did not reveal any relationship between social media use and a belief in dark ideas, it is clear that it takes just one network member to latch on, uncritically, to such an idea promulgated on social media for it to potentially begin contaminating the network at large (i.e., creating an infodemic: [22]). That this might actually occur is reinforced by studies highlighting both: (a) the issues associated with notions of individuals suffering from a crippled epistemology (thus, lacking the ability to verify the evidence they are presented with: [26,27]); and (b) the diminished propensity to engage in critical discussion which can occur in closed networks of close friends [43,66]. Thus, while forming networks with those with whom we share similar views is key for driving ideas-related discussion and engagement, the presence of pragmatic prospection ensures that such engagement can be directed towards beneficial ends, as well as involve suitable levels of critical reasoning. Likewise, it ensures that individuals know how to source ideas to help them achieve goals, and that they are better able to sensibly judge the veracity of the ideas they come across.

5. Conclusions

As English textile designer, poet, artist, writer, and socialist activist, Williams Morris, famously said: "I do not want art for a few, any more than I want education for a few, or freedom for a few" [67] (p. 34). With this paper we have used structural equation modelling to test a framework designed to support efforts to ensure that the possibility of engaging effectively with ideas is available to the many: something that our drives our work in the areas of ideas-engagement and the ideas-informed society. We believe that our resultant model illustrates how democratically minded politicians and policy makers, community leaders, educationalists, and individuals can now ensure we can all gain from the possibility and potential afforded by ideas-engagement. This means developing educational, social network and prospection-related interventions to help individuals connect with the ideas that will benefit them most, while helping people avoid the pitfalls which stem from the lure of dark ideas (e.g., populism, science denial, conspiracy theory, and so forth). Of course, there is both room for improvement within this work and further areas for exploration clearly flow from it. To begin with, our analysis highlights that further development work for our survey is required. While our study relies on self-reported data—a common approach in studying cognitive and social processes—we

acknowledge the potential limitations in how participants perceive and report their critical thinking, network interactions, or prospection abilities. In addition, the finding that there was no relationship between social networks and belief in dark ideas, could potentially be a result of how we measured social networks: with free text rather than multiple choice options perhaps meaning that the number of network connections disclosed by participants might not be reliable or might not have been disclosed at all. Likewise, our survey focused on measuring formal education with the 'other' open text option potentially inadequately capturing non-formal education experiences. In turn, this may have impacted our assessment of the impact of prospective mindsets, critical thinking as well as ideas engagement. In future iterations, we could strengthen validity through triangulation with behavioural measures, network analysis techniques, or mixed-method approaches, while recognising the practical constraints of large-scale studies. As such, we will continue to refine our survey moving forward.

In terms of further areas for investigation, one obvious starting point is to explore whether the model also explains effective ideas-engagement in other, diverse, areas across the globe (for example, in countries which differ from our sample according to their Minkov-Hofstede scores, or those which have different governance systems: e.g., that are more authoritarian or theocratic in nature) will be vital. As such, future studies should consider samples from both wider variations in the Minkov-Hofstede model of culture with regards to the range of individuality (vs. collectivism) and long-term (vs. short-term) orientation scores, but also to begin surveying those countries that differ radically from Western Europe in terms of the nature of how they are governed and the extent to which secular and non-secular institutions are able to control what is deemed as 'acceptable' and 'unacceptable' thought (e.g., those potentially identifiable via measures such as the World Press Freedom Index). Likewise, further work is needed to explore jurisdictions in which there are chronically low education outcomes and low adult literacy rates.

Finally, we also recognize that previous work suggests that different social groups may be more or less likely to have requisite critical thinking skills, levels of prospection, and social networks required to engage in ideas effectively (e.g., [10]). Correspondingly additional analysis is also required to understand which social groups and communities are more likely to benefit from positive ideas, and to identify those in which dark ideas have a greater chance of thriving: thus, allowing potential interventions in this space to be effectively targeted. Given that ongoing world events illustrate that a need for solutions in this space continues to be pressing, we see this multitude of avenues for exploration as providing good starting points for taking the field forward.

Appendix A

Table A1. Operationalising the framework.

Label	Aspect of Framework	Variable	Survey Items	Scale	Existing (E) or New Developed (ND) Items
IE1	Ideas engagement	Value of ideas-engagement [keeping well-informed]	How important is it for you to keep yourself well-informed? For example, by finding out more about different ideas or perspectives; learning more about scientific discoveries and new technology; and/or discovering more about different aspects of history and culture (including arts, literature, etc.).	- Very important - Important - Neither important or unimportant - Somewhat important - Not important	ND
IE2	Ideas engagement	Value of ideas-engagement [staying up-to-date with current affairs]	How important is it for you to stay up to date with current affairs? For example, by staying abreast of political and economic events; keeping up to date with sport; engaging with health-related developments; finding out more about new products, services or forms of media/social media; and/or maintaining an overview of the news generally.	- Very important - Important - Neither important or unimportant - Somewhat important - Not important	ND
IE3	Ideas engagement	Seeking out ideas	Thinking again about both staying up to date with current affairs and keeping yourself well informed, how often do you do the following (please tick all that apply)?: - Watch or listen to news programmes or channels. - Watch or listen to current affairs programmes. - Watch documentaries (of various genres). - Listen to podcasts (of various genres). - Read content from subscription emails. - Read newspapers (physical copies or online). - Engage in other reading (such as magazines or books). - Access social media and blogs for content. - Specific web searching. - Use Wikipedia. - Use a form of generative AI, such as ChatGTP. - Attend public lectures or talks. - Take courses (e.g., history of art, film, etc.) - Activities, such as going to an exhibition at a gallery, museum or science park; or visiting a place of interest, a cultural site or similar.	- Once a day or more - Every few days - About once a week - Once a fortnight - Once a month - Twice a year or less - Never	ND

<p style="text-align:center">Table A1. <i>Cont.</i></p>

Label	Aspect of Framework	Variable	Survey Items	Scale	Existing (E) or New Developed (ND) Items
IE4	Ideas engagement	Seeking out ideas	With these activities in mind, please select the three characteristics that most influence why you engage in/with them: ● They offer topics or subject areas that interest you. ● You trust that they will provide you with reliable information/knowledge. ● Doing these things are part of your regular routine. ● They are enjoyable to use/visit. ● That often feel inspired as a result. ● That the content/subject matter presented is easy to understand. ● That you are presented with an expert view/opinion on a subject. ● An in-depth explanation of the issues is provided. ● They provide something topical, meaning you are up to date. ● They are free/inexpensive to access. ● That the analysis mirrors your own world-view and perspectives (e.g., political views). ● That they are recommended or liked by others you know. ● Not applicable.	● 1 ● 2 ● 3 ● n/a A multi code rather than a ranking approach was used here.	ND
IE5	Ideas engagement	Able to identify positive and dark ideas effectively	Please indicate the extent to which you believe the following statements to be true: ● Participating in cultural activities—such as visiting museums or galleries—can have positive impacts, beyond just learning. ● There is currently no evidence to suggest vaping is bad for your health. ● Being obese can contribute to mental health issues like depression. ● Our outlook on life, (e.g., our attitudes and beliefs), is influenced by the those in our social circles. ● Parents and home environment have a bigger influence on children's success at school than teachers. ● Immigration is the biggest threat facing society and the economy. ● Governments have no secret proof of encounters with UFOs and extra-terrestrial technologies. ● Vaccines (such as MMR or the COVID-19 vaccine) are generally more dangerous to our health than the diseases they are designed to cure.	● I strongly believe this to be true ● I believe this to be true ● I need more information to be able to judge this statement ● I believe this to be untrue ● I strongly believe this to be untrue	ND

Table A1. *Cont.*

Label	Aspect of Framework	Variable	Survey Items	Scale	Existing (E) or New Developed (ND) Items
IE5	Ideas engagement	Able to identify positive and dark ideas effectively	• Global heating (climate change) is directly caused by human activity. • A number of terrorist attacks and incidents (such as 9/11) were carried about by national governments to provide an excuse to impose stricter and more prohibitive laws. • There is evidence to suggest the Earth is actually flat, rather than round. • Archaeologists believe that, before being destroyed, an advanced, Atlantis like, civilisation shared its knowledge with early hunter gatherers, leading to the creation of new civilisations, like ancient Egypt and Mesopotamia.	• I strongly believe this to be true • I believe this to be true • I need more information to be able to judge this statement • I believe this to be untrue • I strongly believe this to be untrue	ND
ED1	Education	Level of education	What is your highest level of qualification?	• No qualifications • School level qualifications (such as GCSE or equivalent) • A level or equivalent • Apprenticeship • Bachelors Degree • Post Graduate Certificate or Diploma • Masters Degree • Doctoral Degree • Other—please specify	E [10]

Table A1. *Cont.*

Label	Aspect of Framework	Variable	Survey Items	Scale	Existing (E) or New Developed (ND) Items
ED2	Education	Ability to think critically	To what extent do you agree with the following statements: • I can recognize inconsistencies in the thoughts of others. • I can grasp the logical connections between different ideas. • I can interpret, evaluate, and analyse facts to make informed judgments. • I actively seek out evidence that might counter what I already know. • I am more likely to trust something when it builds on what I know to be factual/accurate. • If I am not sure about something, I will research to find out more. • I am able to ask hard questions to challenge other people's observations and assumptions. • I am confident in my ability to assess the credibility of information sources. • I know how to search for reliable information to develop my knowledge of a topic. • I am confident to express my expertise on a subject. • I am confident to admit when I do not know something. • I can recognize biases in my own thinking and am open to exploring alternative viewpoints. • I can identify misconceptions and flaws in my reasoning. • It is important that my opinions are influenced by evidence and not solely emotion or personal experience. • I am seldom swayed by a speaker's ability to make a compelling case if it is not backed up with evidence.	• Strongly Disagree • Disagree • Neither agree nor disagree • Agree • Strongly Agree	ND

Label	Aspect of Framework	Variable	Survey Items	Scale	Existing (E) or New Developed (ND) Items
NW1	Networks	Network size	Please indicate the approximate number of: • Close friends you have. • Close family members you have. • Members of a club you belong to (such as a sports club) to whom you talk socially [other than close friends]. • Members of a group or community you belong to whom you talk socially [other than close friends]. • Members of a religious group you belong to (such as church, mosque temple or synagogue) to whom you talk socially [other than close friends]. • Work colleagues to whom you talk socially [other than close friends]. • Neighbours to whom you talk socially [other than close friends]. • Social media connections you have. • Social media connections (excluding family and friends) that you engage with.	Open response text	ND
NW2	Networks	Ideas network centrality [keeping well-informed]: how many people respondents discuss ideas with	Thinking about keeping yourself well-informed for the moment (for example, when you find out more about different ideas or perspectives; learn more about scientific discoveries and new technology; and/or discover more about different aspects of history and culture—including arts, literature, etc.), with how many of your social connections do you discuss these types of things? [uses same set of responses as Network Size]	• I discuss with all or almost all • I discuss with many • I discuss with about half • I discuss with a few • I discuss with very few or none • n/a	ND
NW3	Networks	Ideas network centrality [keeping well-informed]: how often respondents discuss ideas with social connections	Thinking about keeping yourself well-informed for the moment (for example, when you find out more about different ideas or perspectives; learn more about scientific discoveries and new technology; and/or discover more about different aspects of history and culture—including arts, literature, etc.), how often do you discuss these types of things with your social connections? [uses same set of responses as Network Size]	• Every time I see them/engage with them • Most times that I see them/engage with them • On some of the occasions when I see them/engage with them • Rarely • Never • n/a	ND

Table A1. *Cont.*

Label	Aspect of Framework	Variable	Survey Items	Scale	Existing (E) or New Developed (ND) Items
NW4	Networks	Ideas network centrality [staying up-to-date with current affairs]: how many people respondents discuss ideas with	Thinking about keeping staying up to date with current affairs for the moment (for example, when you stay abreast of political and economic events; keep up to date with sport; engage with health-related developments; find out more about new products, services or forms of media/social media; and/or maintain an overview of the news generally), with how many of your social connections do you discuss these types of things? [uses same set of responses as Network Size]	• I discuss with all or almost all • I discuss with many • I discuss with about half • I discuss with a few • I discuss with very few or none • n/a	ND
NW5	Networks	Ideas network centrality [staying up-to-date with current affairs]: how often respondents discuss ideas with social connections	Thinking about keeping staying up to date with current affairs for the moment (for example, when you stay abreast of political and economic events; keep up to date with sport; engage with health-related developments; find out more about new products, services or forms of media/social media; and/or maintain an overview of the news generally), how often do you discuss these types of things with your social connections? [uses same set of responses as Network Size]	• Every time I see them/engage with them • Most times that I see them/engage with them • On some of the occasions when I see them/engage with them • Rarely • Never • n/a	ND
NW6	Networks	Ideas network ties [weak or strong]	With these social connections in mind, please select the three characteristics that most influence why you engage with about current affairs, ideas or new perspectives: • That you consider them to be knowledgeable. • That you have similar views, outlooks, or beliefs in common. • That you find them easy to talk to. • That you find their points of view interesting or enlightening. • That they positively challenge your existing views, outlook, or beliefs. • That you find their perspective reassuring. • That other people you know think they are worth listening to. • That you feel comfortable expressing your views to them. • Other [please specify]. • n/a	• 1 • 2 • 3 • n/a A multi code rather than a ranking approach was used here.	ND

Label	Aspect of Framework	Variable	Survey Items	Scale	Existing (E) or New Developed (ND) Items
NW7	Networks	Network density	To what extent do your close friends: • Share the same political views as you? • Have the same level of qualifications as you? • Live in the same neighbourhood as you? • Have the same occupation as you? • Belong to the same clubs you belong to (such as a sports club)? • Belong to the same groups or communities you belong to? • Belong to the same religious group you belong to (such as church, mosque, or synagogue)? • Share something else in common with you (such as interests or hobbies)? • Believe the same kinds of things to be true as you? • Know one another?	• All do • Most do • Some do • Very few do • None do • Do not know • n/a	ND
PR1	Prospection	Whether respondents possess a prospective mindset	To what extent do you agree with the following statements: • I contemplate my ideal outcomes for the future. • I imagine what my future will be like once I reach my goals. • I consider alternative paths toward a goal and choose the best one. • I get stuck when I encounter unexpected delays or difficulties on the way to a goal. • My goals exceed the reality of what I can do. • I make plans that specify different courses of action depending on how things progress. • I am unsure what to do when things do not go as planned. • My goals are so optimistic that I rarely meet them. • When making a plan, I build in extra time for unanticipated problems or delays. • When I reach a "fork in the road" on the way to a goal, I get stuck deciding which path to choose. • I envision the outcomes I want most. • I consider obstacles I might encounter on the way to my goal and plan how I will deal with them. • My goals are often unrealistic given the time and resources I have available.	• Strongly Disagree • Disagree • Neither agree nor disagree • Agree • Strongly Agree	E [51]

Table A1. *Cont.*

Label	Aspect of Framework	Variable	Survey Items	Scale	Existing (E) or New Developed (ND) Items
PR1	Prospection	Whether respondents possess a prospective mindset	• I am uneasy when circumstances require me to modify my plans. • I make a backup plan in case my original plan fails. • I identify the outcome I am hoping for among the possible future outcomes. • My goals are often impractical. • I imagine how I will feel after reaching my goal.	• Strongly Disagree • Disagree • Neither agree nor disagree • Agree • Strongly Agree	E [51]

Appendix B

Table A2. CFA results.

Latent Variables	Observed Variables	Coefficient	Std. Err.	z	*p* > z	[95% Conf. Interval]	
Idea Engagement							
	Value of ideas-engagement (IE1)	0.27	0.01	23.96	0.00	0.25	0.29
	_cons	4.17	0.04	112.61	0.00	4.09	4.24
	Value of ideas-engagement (IE2)	0.24	0.01	20.78	0.00	0.22	0.26
	_cons	4.07	0.04	112.34	0.00	4.00	4.14
	Keeping Informed Networks Frequency	0.92	0.00	374.82	0.00	0.91	0.92
	_cons	2.05	0.02	97.80	0.00	2.00	2.09
	Current Affairs Networks Discussion	0.90	0.00	331.20	0.00	0.90	0.91
	_cons	1.74	0.02	92.30	0.00	1.70	1.78
	Current Affairs Networks Frequency	0.94	0.00	467.88	0.00	0.94	0.95
	_cons	1.94	0.02	96.11	0.00	1.90	1.98
	Active In-Person Engagement with Ideas	0.53	0.01	60.39	0.00	0.52	0.55
	_cons	1.50	0.02	86.64	0.00	1.47	1.54
	Traditional consumption of ideas	0.22	0.01	19.17	0.00	0.20	0.25
	_cons	3.49	0.03	110.19	0.00	3.42	3.55
	Digital exploration of ideas	0.42	0.01	41.85	0.00	0.40	0.44
	_cons	3.32	0.03	109.41	0.00	3.26	3.38

Table A2. *Cont.*

Latent Variables	Observed Variables	Coefficient	Std. Err.	z	*p* > z	[95% Conf. Interval]	
Network							
	Network size (NW1)	0.20	0.01	14.98	0.00	0.17	0.22
	_cons	0.61	0.01	46.79	0.00	0.58	0.63
	Ideas network centrality (NW2)	0.57	0.01	53.78	0.00	0.55	0.59
	_cons	1.80	0.02	93.43	0.00	1.76	1.83
	Network Homophily	0.58	0.01	57.03	0.00	0.56	0.60
	_cons	4.22	0.04	112.75	0.00	4.14	4.29
	Network Social Capital	0.91	0.01	81.09	0.00	0.89	0.93
	_cons	1.85	0.02	94.53	0.00	1.81	1.89
Prospection							
	Q1	0.62	0.01	69.72	0.00	0.60	0.63
	_cons	3.96	0.04	112.00	0.00	3.89	4.03
	Q2	0.67	0.01	83.35	0.00	0.66	0.69
	_cons	3.67	0.03	110.97	0.00	3.61	3.74
	Q3	0.63	0.01	74.88	0.00	0.61	0.65
	_cons	4.23	0.04	112.78	0.00	4.16	4.30
	Q4	−0.072	0.01	−5.43	0.00	−0.098	−0.046
	_cons	3.35	0.03	109.54	0.00	3.29	3.41
	Q5	−0.175	0.01	−13.6	0.00	−0.2	−0.15
	_cons	3.26	0.03	109.08	0.00	3.20	3.32
	Q6	0.58	0.01	64.85	0.00	0.57	0.60
	_cons	4.00	0.04	112.10	0.00	3.93	4.07
	Q7	−0.004	0.01	−0.32	0.75	−0.031	0.02
	_cons	3.34	0.03	109.50	0.00	3.28	3.40
	Q8	−0.004	0.01	−0.32	0.75	−0.031	0.02
	_cons	3.34	0.03	109.50	0.00	3.28	3.40
	Q9	0.49	0.01	47.28	0.00	0.47	0.51
	_cons	3.95	0.04	111.97	0.00	3.88	4.02
	Q10	−0.07	0.01	−5.24	0.00	−0.096	−0.044
	_cons	3.31	0.03	109.34	0.00	3.25	3.37
	Q11	0.60	0.01	68.43	0.00	0.58	0.62
	_cons	4.49	0.04	113.43	0.00	4.41	4.57

Table A2. *Cont.*

Latent Variables	Observed Variables	Coefficient	Std. Err.	z	*p* > z	[95% Conf. Interval]	
	Q12	0.60	0.01	67.87	0.00	0.59	0.62
	_cons	4.20	0.04	112.70	0.00	4.13	4.27
	Q13	−0.01	0.01	−0.91	0.36	−0.04	0.01
	_cons	3.33	0.03	109.48	0.00	3.27	3.39
	Q14	−0.16	0.01	−12.23	0.00	−0.18	−0.133
	_cons	3.00	0.03	107.56	0.00	2.94	3.05
	Q15	0.54	0.01	55.36	0.00	0.52	0.56
	_cons	3.68	0.03	111.02	0.00	3.62	3.75
	Q16	0.63	0.01	74.11	0.00	0.61	0.64
	_cons	4.46	0.04	113.36	0.00	4.39	4.54
	Q17	0.06	0.01	4.42	0.00	0.03	0.09
	_cons	3.87	0.04	111.69	0.00	3.80	3.94
	Q18	0.59	0.01	66.84	0.00	0.58	0.61
	_cons	3.81	0.03	111.47	0.00	3.74	3.87
Education							
	Ability to think critically (ED2)	0.162	0.012	13.16	0.00	0.14	0.186
	_cons	2.535	0.024	103.85	0.00	2.49	2.582
	Q1	0.59	0.01	69.52	0.00	0.58	0.61
	_cons	4.59	0.04	113.65	0.00	4.51	4.67
	Q2	0.67	0.01	91.97	0.00	0.66	0.69
	_cons	5.37	0.05	115.00	0.00	5.28	5.46
	Q3	0.69	0.01	96.62	0.00	0.67	0.70
	_cons	5.27	0.05	114.86	0.00	5.18	5.36
	Q4	0.40	0.01	37.58	0.00	0.38	0.42
	_cons	3.69	0.03	111.06	0.00	3.63	3.76
	Q5	0.54	0.01	58.11	0.00	0.52	0.56
	_cons	5.10	0.04	114.59	0.00	5.01	5.18
	Q6	0.64	0.01	80.85	0.00	0.62	0.65
	_cons	5.35	0.05	114.97	0.00	5.26	5.44
	Q7	0.57	0.01	64.82	0.00	0.55	0.59
	_cons	4.07	0.04	112.34	0.00	4.00	4.15
	Q8	0.63	0.01	79.77	0.00	0.62	0.65
	_cons	4.93	0.04	114.31	0.00	4.84	5.01

Table A2. *Cont.*

Latent Variables	Observed Variables	Coefficient	Std. Err.	z	p > z	[95% Conf. Interval]	
	Q9	0.69	0.01	98.30	0.00	0.68	0.71
	_cons	5.21	0.05	114.77	0.00	5.12	5.30
	Q10	0.58	0.01	67.44	0.00	0.57	0.60
	_cons	4.51	0.04	113.47	0.00	4.43	4.59
	Q11	0.53	0.01	57.12	0.00	0.51	0.55
	_cons	5.07	0.04	114.54	0.00	4.98	5.15
	Q12	0.56	0.01	61.73	0.00	0.54	0.57
	_cons	5.09	0.04	114.58	0.00	5.00	5.18
	Q13	0.57	0.01	65.49	0.00	0.56	0.59
	_cons	5.16	0.05	114.69	0.00	5.07	5.25
	Q14	0.59	0.01	68.23	0.00	0.57	0.60
	_cons	4.87	0.04	114.21	0.00	4.79	4.96
	Q15	0.45	0.01	43.77	0.00	0.43	0.47
	_cons	4.28	0.04	112.92	0.00	4.21	4.36
Able to identify positive and dark ideas effectively							
	Q1	0.32	0.01	23.95	0.00	0.29	0.34
	_cons	1.08	0.02	72.29	0.00	1.05	1.11
	Q2	0.37	0.01	29.29	0.00	0.39	0.34
	_cons	2.51	0.02	103.58	0.00	2.46	2.56
	Q3	0.20	0.01	14.46	0.00	0.17	0.23
	_cons	1.07	0.02	71.54	0.00	1.04	1.09
	Q4	0.27	0.01	20.22	0.00	0.25	0.30
	_cons	1.29	0.02	80.15	0.00	1.26	1.32
	Q5	0.07	0.01	4.91	0.00	0.04	0.10
	_cons	1.39	0.02	83.49	0.00	1.36	1.43
	Q6	0.45	0.01	37.63	0.00	0.47	0.43
	_cons	1.84	0.02	94.22	0.00	1.80	1.88
	Q7	0.20	0.01	14.93	0.00	0.17	0.23
	_cons	1.58	0.02	88.61	0.00	1.55	1.62
	Q8	0.67	0.01	68.20	0.00	0.69	0.65
	_cons	2.21	0.02	100.09	0.00	2.16	2.25
	Q9	0.34	0.01	26.46	0.00	0.32	0.37
	_cons	1.15	0.02	75.14	0.00	1.12	1.18

Table A2. *Cont.*

Latent Variables	Observed Variables	Coefficient	Std. Err.	z	*p* > z	[95% Conf. Interval]	
	Q10	0.58	0.01	55.20	0.00	0.61	0.56
	_cons	2.22	0.02	100.24	0.00	2.17	2.26
	Q11	0.59	0.01	55.82	0.00	0.61	0.57
	_cons	3.64	0.03	110.84	0.00	3.57	3.70
	Q12	0.37	0.01	29.66	0.00	0.40	0.35
	_cons	2.30	0.02	101.30	0.00	2.26	2.35

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