



Uneven development, competitiveness and behavioural economic geography: Addressing ‘levelling up’ policies from a human perspective

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Abstract

This paper draws on behavioural economic geography to identify the factors affecting uneven development. It uses the lens of economic competitiveness and addresses the association between differences in human behavioural traits and competitiveness in the context of localities across the United Kingdom. It focusses on the policy requirement for ‘levelling up’ by improving the performance of lagging localities. On the basis of the finding that local behavioural factors impact competitiveness, the paper develops a behavioural public policy agenda. It is concluded that a greater appreciation of the human behavioural profile of a place can provide a vital cog in stimulating economic development through a more holistic approach to public policy.

KEYWORDS

behavioural economic geography, economic competitiveness, levelling up, public policy, uneven development

1 | INTRODUCTION

Examining the role of human behavioural factors in determining economic activity and performance, as well as the wider development of society more generally, has a long tradition across particular areas of socio-economic research stretching back to Smith’s (2009) theory of moral sentiments. In more recent years, however, this has tended to fall out of fashion in economic theory, especially regional theory and regional development policy (Rodríguez-Pose, 2013). In

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perhaps a behavioural turn, moments of crisis and seemingly unexplainable anomalies have reignited an interest in these factors due to mainstream theories not always being fully equipped to explain or predict these happenings (Freytag & Thurik, 2007; Shiller, 2003). As a result, new scholarly work addressing the individual and collective behaviour stemming from particular personality and cultural traits that coalesce within regions and localities has emerged (for reviews see Huggins & Thompson, 2021a; Mewes et al., 2022). This research has been aided by the establishment of new and larger datasets that have facilitated both deeper and broader analysis.

This paper examines work from the emerging area of behavioural economic geography to identify the factors affecting the development and growth of localities and regions. It further seeks to address the policy implications this analysis raises. It is set in the context of addressing uneven economic development across places and the requirement for 'levelling up', especially improving the economic competitiveness of lagging regions and localities in the United Kingdom (UK Government, 2021). The issue of uneven economic development and persistent differences in regional growth in the United Kingdom has dogged the nation for many years, with discussions of the north–south divide resonating down the decades (Gardiner et al., 2013; Rowthorn, 2010; Scott, 2007). In recent years, it has registered strongly with the levelling up agenda of the Conservative Government (McCann & Ortego-Argilés, 2021; Tomaney & Pike, 2020).

Much of the discussion around levelling up assumes that large investments in infrastructure, which partly addresses historical imbalances in public investment per head (Cox & Davies, 2013; Martin et al., 2016; Sheffield Political Economy Research Institute [SPERI], 2015), are a key determinant in achieving greater parity in outcomes across regions (Connolly et al., 2021). Clearly, such investments may help, as there is some evidence that a number of the larger northern cities in the United Kingdom appear to be enjoying improvements in local competitiveness thanks to investments through their city deals (Huggins, Prokop, & Thompson, 2021). However, this paper argues that if these investments are to be effective in the long-term, geographical patterns of human behaviour needed to be factored into the decisions underlying these investments. Indeed, without considering these factors, attempts at levelling up may only achieve temporary benefits with large inequalities continuing to exist.

To explore these issues, the paper begins by considering the growing body of work on personality psychology, socio-spatial culture and institutional factors associated with uneven economic development and their role in determining the economic competitiveness of regions and localities. Following that, data on the local distribution of personality psychology, socio-spatial culture and economic competitiveness in the United Kingdom are analysed to consider these associations. On the basis of these findings, the paper considers the policies that may be most appropriate for assisting in 'levelling up' at the regional and local levels.

2 | COMPETITIVENESS AND THE GEOGRAPHY OF HUMAN BEHAVIOUR

The UK Government (2021) has stated its objective to 'level up' the nation's regions and localities. For any policymaker seeking to achieve this on a lasting basis, the concept of local or regional 'competitiveness' is important, as it refers to the capability of these places to attract and maintain firms with stable or rising market shares in an activity, while maintaining stable or increasing standards of living for those participating in it (Storper, 1997). This connects with the idea of local or regional development becoming manifest in forms that benefit the population of an area as a whole (Pike et al., 2007). The UK Competitiveness Index (UKCI) provides recent evidence that large cities such as Liverpool and Manchester receiving national competition-based funding through so-called 'City Deals' have improved their competitiveness in recent years (Huggins, Prokop, & Thompson, 2021). However, it has been argued by others that the territorial competition created by this approach is likely to lead to greater rather than less inequity between localities. In particular, the ability to access these resources in part reflects the information and existing resources these localities are able to access when seeking to make these deals (O'Brien & Pike, 2015). Furthermore, the perceived need to retain the global competitiveness of London continues to result in more resources being sucked into London at the expense of other regions of the United Kingdom (Pike et al., 2019).



In general, previous interventions in the United Kingdom and elsewhere, such as those across the European Union (EU), have failed to address inequalities between regions in a lasting fashion (McCann, 2016; McGuinness & Sheehan, 1998; Petrakos et al., 2011). Investments in infrastructure and business support in lagging regions of the EU have been found to be ineffective at best (Rodríguez-Pose & Fratesi, 2004). Some argue that infrastructure investments may have actually worsened disparities, with more peripheral regions being more easily served from central locations (Iammarino et al., 2019). Furthermore, from the perspective and contrasting experiences of old industrial areas, the culture and institutions established to support historical economic activities have prevented the creation of new development paths (Blažek et al., 2020; Hassink, 2010a, 2010b; Huggins & Thompson, 2023).

The types of industrial culture that encourage the adoption or otherwise of new ideas and technology are influenced by prevailing wider social culture and institutions established within regions (Byrne, 2002; Görmär & Harfst, 2019). Consistent with the success of leading advanced locations around the world, industrial culture is based on social interaction and networking, and therefore any divide between industry cultural and wider local/regional culture is likely to be indistinct, as each will be mutually re-enforcing (Harfst et al., 2018; Huggins & Thompson, 2019, 2023). Furthermore, regions are more likely to be successful in the long run when their identity evolves (Prud'homme van Reine & Dankbaar, 2011) and they possess the political and entrepreneurial agency to create new institutions to avoid lock-in (Bristow & Healy, 2014).

The above perspective fits closely with the work of Obschonka et al. (2015), who argue that knowledge resources in the form of skilled individuals will be insufficient to create growth and competitiveness alone. Instead, it is the combination of these resources and an 'entrepreneurial culture' that will allow these resources to be deployed successfully. This suggests that without supporting key local psychocultural foundations and appropriate institutions, the provision of financial and other support is likely to have at best a temporary effect on lagging areas (Huggins & Thompson, 2021b; Mewes et al., 2022; Rodríguez-Pose & Garcilazo, 2015).

Clearly, it takes considerable time for the networks and culture to support innovative activities and new path creation to develop through various mechanisms. Studies such as those of Rentfrow et al. (2008, 2013) highlight the role of particular cultures in generating flows of selective migration whereby particular personality types are drawn to certain localities. Such migration may create and reinforce the geographical distributions of personality types. In particular, the more 'open' individuals are found to be, the greater the propensity to migrate (Jokela, 2009). Huggins and Thompson (2021a) find that in the UK people tend to migrate between localities with similar psychocultural profiles; that is, places within similar culture and people with similar personality traits. Much migration in the United Kingdom is between localities with 'open' cultures and people, which in effect enhances knowledge flow between these leading localities and reinforces inequalities with lagging localities.

As well as attracting resources, the behavioural – or psychocultural – profile of a locality can affect the effectiveness of the utilization of knowledge resources. Diversity, for example, is long cited as a key factor in helping to access new ideas and information that boost urban and regional competitiveness (Jacobs, 1969). While diversity is generally argued to be positive for local and regional development, it could have the opposite effect when society becomes fragmented and positive institutional development is hindered. Nevertheless, there are likely to be benefits for those localities that attract open and extravert individuals. This will create the types of linkages and networks that are associated with the success of leading innovative localities and regions around the world (Huggins & Thompson, 2023).

This suggests that localities may lack competitiveness due to the underlying personality types and cultural dimensions present in these localities. A means of attempting to empirically measure this connection we undertake the analysis outlined below, which is diagrammatically summarized by Figure 1. Most measures of personality psychology and cultural traits explored in connection to economic development and growth are multidimensional (Gorodnichenko & Roland, 2011). This has meant that studies have often addressed a small number of traits or dimensions in relation to the outcome measure of interest. For example, Shane (1992) concentrates on Hofstede's (1980) dimensions of individualism and power distance and how these are related to innovation.

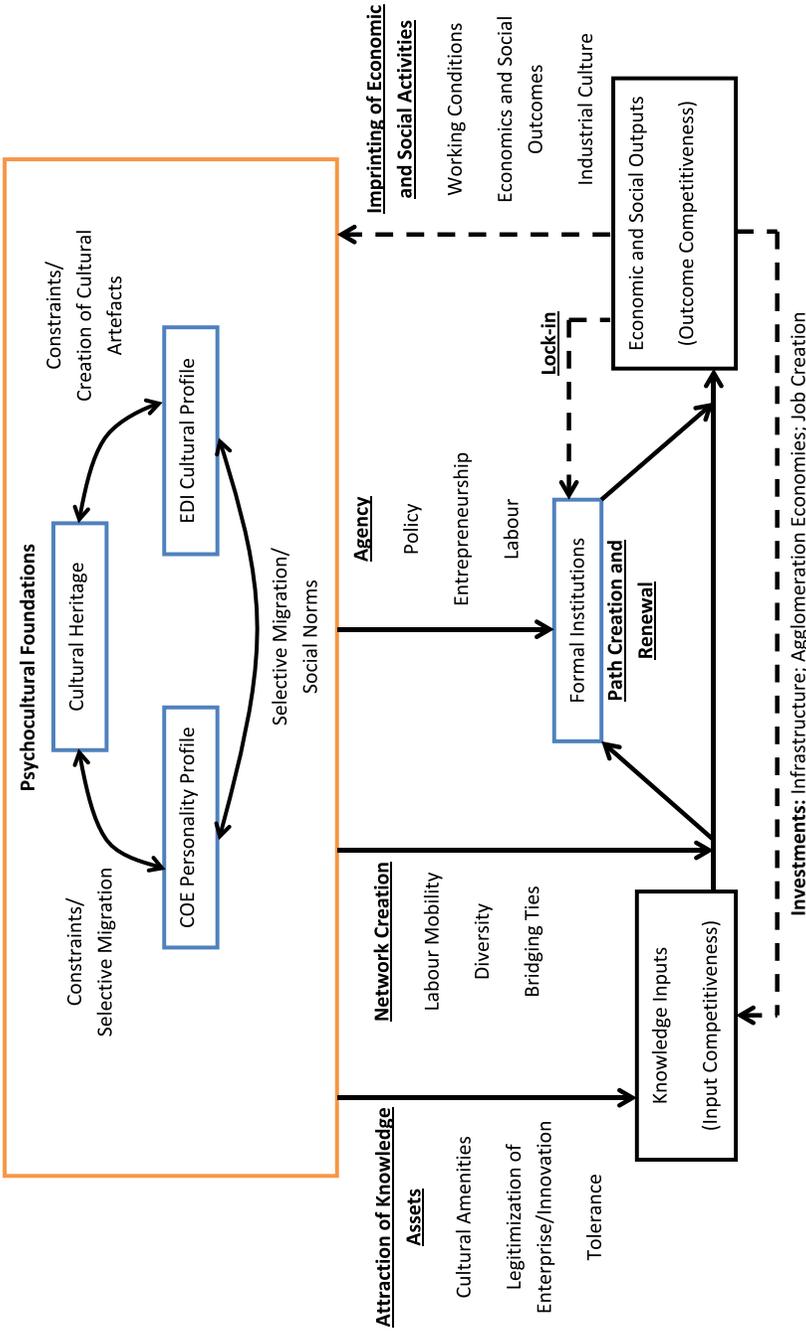


FIGURE 1 The behavioural foundations of economic development and competitiveness.



Other work has considered the extent to which a range of dimensions of culture are independently related to economic outcomes (Huggins & Thompson, 2021a, 2021b) or personality traits that are related to, for example, innovation (Lee, 2017; Mewes et al., 2022). However, there is an argument that it is not the individual traits or personality that are important, but the combination of those present either at the individual (Schmitt-Rodermund, 2004) or community (Rentfrow et al., 2013) levels. To address this, the approach to capturing both a composite personality profile and cultural profile are outlined next, along with a discussion of the competitiveness measure.

3 | METHODOLOGY

In this section we detail the methodology adopted to examine how local behavioural factors concerning local personality profiles and local cultural factors are associated with local economic competitiveness. The study first takes the unit of analysis to be local authority areas ('localities') across Great Britain (357 observations) and then we specifically focus on local authority areas in England (307 observations) due to some data limitations when assessing all British localities. We acknowledge that these areas are not necessarily perfect functional economic and social areas, as they are based on the spatiality of local government responsibility boundaries, but they do allow access to a relatively wide range of appropriate data. The mode of analysis is to first undertake a bivariate correlation analysis and then to adopt a multivariate regression analysis.

As a means of examining the independent and combined influence of local personality profiles and local cultural profiles, it is necessary to produce a measure for each that is theoretically associated with local competitiveness. To develop the Local Personality Profile, we draw on previously developed measures of personality through the provision of a set of clear and easy to interpret measures (John & Srivastava, 1999). Therefore, this study adopts the Big Five approach to capturing personality differences given the widespread use of these measures in the empirical literature on personality traits. The Big Five consists of the following traits: (1) openness: the tendency to be open to new aesthetic, cultural or intellectual experiences; (2) conscientiousness: the tendency to be organized, responsible and hardworking; (3) extraversion: an orientation of one's interests and energies towards the outer world of people and things rather than the inner world of subjective experience, characterized by positive affect and sociability; (4) agreeableness: the tendency to act in a cooperative and unselfish manner; and (5) neuroticism (cf. emotional stability): a chronic level of emotional instability and proneness to psychological distress, while emotional stability is largely the opposite and concerns predictability and stability in emotional reactions, with an absence of rapid mood changes (Goldberg, 1992).

The data to create the personality measure are drawn from the British Broadcasting Corporation's (BBC) Lab UK website as part of the BBC's and University of Cambridge's Big Personality Test project. A total of 588,014 individuals across the United Kingdom completed the online survey. Respondents were required to sign up for a BBC ID to ensure that they did not complete the survey twice. The instrument used to collect the data is the Big Five Inventory (John & Srivastava, 1999). This consists of 44 short statements associated with the prototypical traits of the five personality traits, with respondents indicating their agreement on a 5-point Likert scale (1 - disagree strongly to 5 - agree strongly). The five personality traits are identified from the 44 individual measures using a principal component analysis and varimax rotation and can be robustly analysed at the local authority area level (Rentfrow et al., 2015).

The analytical approach used to develop a personality profile at the local level draws on Obschonka et al. (2020). This measure relates to the individual personality traits broadly associated with entrepreneurial behaviour (Brandstätter, 1997). Obschonka et al. (2020) consider the highest average values achieved at a local level for the following personality traits: conscientiousness, openness and extraversion (COE), and the lowest values achieved for agreeableness and neuroticism (i.e., those personality traits negatively associated with entrepreneurship). The distance of each locality from the highest (COE) and lowest (agreeableness and neuroticism) values is considered. The negative inverse of these values is taken for each personality dimension and summed. This means that a hypothetical locality with the highest achieved average values for conscientiousness, openness and extraversion and the lowest



achieved average value for agreeableness and neuroticism would take a value of zero, but the further from this 'model locality' average, the more negative the overall COE measure for a locality. Therefore, we label this local behavioural profile measure as the COE Personality Profile.

To produce a Local Cultural Profile, we utilize the five dimensions developed by Huggins and Thompson (2021a). They follow the approach of Chinni and Gimpel (2011) by using secondary data to produce measures which can be employed at a lower level of aggregation. The measures are based on existing cultural measures at a national level, but enable the creation of local cultural measures (see Table A1 for the full list of the included indicators). The five dimensions consist of: (1) engagement with education and work – partly drawing on Weber's (1930) enduring notion of the work ethic and attitudes to economic participation; (2) social cohesion (cf. social diversity) – relating to Durkheim's (1893) notion of mechanical and organic solidarity social cohesion, whereby trait similarities and interdependence among individuals result in a perceived unity, togetherness and less likelihood of exclusion; (3) femininity and caring attitudes – relating to Hofstede's (1980) typology of national cultures and the notion of the femininity or masculinity of these cultures, with masculine cultures considered to be more competitive and materialistic than their feminine counterparts, which are more caring and harmonious in their outlook (we appreciate that to some extent this typology could be considered stereotypically outdated, but the idea of cultural femininity endures within the literature (Shneor et al., 2013)); (4) adherence to social rules – referring to the acknowledged role of such adherence for coordination purposes (Rodríguez-Pose & Storper, 2006) but also noting that it may constrain creative and innovative behavioural intentions; and (5) collective action (cf. individual action) – referring to the extent to which regions and localities adopt equity-driven cooperative action approaches as opposed to more individualistic action approaches (Johnstone & Lionais, 2004).

As with the creation of the COE personality profile above, Obschonka et al.'s (2020) approach is used, and following Huggins and Thompson (2021b), it is proposed that a culture supportive of entrepreneurial and innovative activities is one that is high in cultural traits related to (i) engagement with education and employment; (ii) social diversity; (iii) and preferences for individual activities (EDI cultural profile). Therefore, we label this local behavioural profile measure as the EDI Cultural Profile.

The EDI Cultural Profile measures what might be regarded as the contemporary 'living culture' of a locality. As indicated by Figure 1, it is also possible to consider measures of 'cultural heritage'. Therefore, within our analysis we follow Tubadji and Pelzel (2015) by including a measure of such cultural heritage. Their approach, applied to the German context, is to consider the presence of city walls and historic gardens as reflecting greater cultural heritage. To generate similar measures for England we use the approach of Huggins and Thompson (2021b) by drawing on the National Heritage List of structures for preservation in England. Listed buildings and other structures are those identified as requiring protection against destruction or modification as they are of architectural or historic special interest. Structures chosen to be included on the listing in part reflect the presence of historical artefacts but also the willingness of the local population to apply to have them protected.

The list includes a total of 379,064 listed buildings. The entries provide coordinates for each listed building, which were then mapped onto the English local authority areas. A small number of entries were associated with local authority areas in Wales and Scotland and were removed from the data. This varies from 35 listed buildings in Castle Point in the East of England (Essex) to 12,586 in Cornwall. We consider the listed buildings per head in each area of England to reflect the amount of cultural heritage available per person. This varies from 2.46 per 10,000 people in Barking and Dagenham to 606.19 per 10,000 people in Cotswold in the southwest of England.

Finally, within our analysis we utilize a measure of Local Competitiveness. Such competitiveness can be considered from an 'input competitiveness' perspective in terms of considering those knowledge resources required by firms to achieve stable and growing market shares, or as 'outcome competitiveness' in terms of capturing the extent to which competitiveness has been achieved (Aiginger & Firgo, 2017; Huggins & Thompson, 2017). Given the focus of this paper on competitiveness as a concept for establishing the potential for localities to be 'levelled up', both are relevant. Input competitiveness is relevant as those localities lacking the relevant knowledge inputs will need assistance to create and attract inputs either directly or indirectly through the generation of the infrastructure and



amenities they require (Garretsen & Marlet, 2017). There is also a need to consider the capability of the locality to convert inputs into high value outputs and ultimately high standards of living for residents (Pike et al., 2007). Indeed, it is unwise to assume that greater input competitiveness will automatically lead to improved outcome competitiveness, as studies have suggested that government interventions have been relatively ineffective in promoting local or regional convergence (McGuinness & Sheehan, 1998; Petrakos et al., 2011; Rodríguez-Pose & Fratesi, 2004).

To measure the relative competitiveness of localities across the United Kingdom, we draw on data from the UK Competitiveness Index (UKCI), which is published every 2 or 3 years and covers the localities of Great Britain measured at the local authority district level, with the exceptions of very small (area and population) atypical localities of the City of London and the Isles of Scilly. It is a three-factor measure of competitiveness that has been published since 2000 and accounts for both input and outcome competitiveness (Huggins, 2003; Huggins, Prokop, & Thompson, 2021). The three component indices (inputs, outputs and outcomes) are measured compared with the UK average and combined with an equal weighting to give the overall competitiveness score for each locality (see Table A2 for details of the components included in the UKCI).

As previously indicated, we undertake both correlation analysis and regression analysis. The correlations are based on a Pearson analysis. The analysis considers the relationships between the COE personality profile and EDI cultural profile with not only the overall UKCI, but also the component input, output and outcome competitiveness indices to provide some insight into whether there is evidence of their proposed impact through both input and outcome competitiveness. As previously discussed and outlined in Figure 1, cultural heritage is also predicted to have a role in determining competitiveness, so correlations are also examined for listed buildings per capita.

The regression analysis is conducted using the overall UKCI, as our expectation is that for personality and culture to have an influence on levelling up, competitiveness in all its components will require addressing. Ordinary least squares (OLS) regressions are used to estimate the relationship between competitiveness, personality (COE personality profile) and community culture, both in terms of living culture (the EDI cultural dimension) and cultural heritage (listed buildings per capita), so the estimated equation takes the following form:

$$Comp_i = \alpha_0 + \beta_1 Pers_i + \beta_2 LivCult_i + \beta_3 CultHerit_i + \gamma Controls + \varepsilon_i \quad (1)$$

where $Comp_i$ is the competitiveness of locality i as measured by the UKCI and $Pers$ is the COE personality profile. The two cultural measures as reflected by $LivCult$ and $CultHerit$ are captured by the EDI cultural profile and listed buildings per capita, respectively. Given that other factors are likely to influence competitiveness, we include a number of controls ($Controls$), which are discussed below, and ε is the error term. As cultural heritage is only available for the sub-sample of 307 English localities, rather than all 357 localities in Britain, the regressions are run both with cultural heritage included and excluded from the specifications.

Other influences on competitiveness are likely to be associated with population distribution, industry structure, infrastructural and institutional factors. Table A3 provides the details of these controls. To account for any omitted influences from the wider regional context, which may be important due to commuting patterns between localities, we also include dummies for NUTS1 regions.

4 | ANALYSING THE RELATIONSHIP BETWEEN BEHAVIOURAL PROFILES AND COMPETITIVENESS

In this section we empirically analyse the relationship between the behavioural profile measures and competitiveness of localities. Tables 1 and 2 present the correlation coefficients for the behavioural profiles and competitiveness, with Table 1 relating to British local authorities areas and Table 2 concentrating on those in England (due to the cultural heritage measure only being available for English localities). Regardless as to whether considering the localities of Great Britain or England alone, it is clear that there is a positive relationship between both the COE


TABLE 1 Correlation matrix of competitiveness, COE personality profile, EDI cultural profile and local characteristics for Great Britain.

	1. UKCI	2	3	4	5	6	7	8	9
2. COE personality profile	0.593 (0.000)								
3. EDI cultural profile	0.628 (0.000)	0.405 (0.000)							
4. Population density	0.529 (0.000)	0.359 (0.000)	0.705 (0.000)						
5. Industrial diversification	-0.295 (0.000)	-0.315 (0.000)	-0.334 (0.000)	-0.491 (0.000)					
6. Industrial specialization	0.265 (0.000)	0.147 (0.005)	0.123 (0.020)	0.314 (0.000)	-0.473 (0.000)				
7. Major airport	0.373 (0.000)	0.205 (0.000)	0.364 (0.000)	0.330 (0.000)	-0.133 (0.012)	0.049 (0.352)			
8. Port	0.050 (0.347)	0.065 (0.221)	0.028 (0.592)	0.220 (0.000)	-0.283 (0.000)	0.155 (0.003)	0.015 (0.775)		
9. Rail connections	0.645 (0.000)	0.405 (0.000)	0.514 (0.000)	0.571 (0.000)	-0.421 (0.000)	0.286 (0.000)	0.264 (0.000)	0.197 (0.000)	
10. Institutions	0.287 (0.000)	0.244 (0.000)	0.469 (0.000)	0.268 (0.000)	-0.177 (0.001)	-0.032 (0.543)	0.053 (0.319)	0.167 (0.002)	0.280 (0.000)

Note: *p*-Values in parentheses; *N* = 357.



TABLE 2 Correlation matrix of competitiveness, COE personality profile, EDI cultural profile and local characteristics for England.

	1. UKCI	2	3	4	5	6	7	8	9	10
2. COE personality profile	0.591 (0.000)									
3. EDI cultural profile	0.614 (0.000)	0.370 (0.000)								
4. Cultural heritage	−(0.060) (0.291)	(0.289) (0.000)	−(0.320) (0.000)							
5. Population density	0.514 (0.000)	0.356 (0.000)	0.745 (0.000)	−0.383 (0.000)						
6. Industrial diversification	−0.363 (0.000)	−0.373 (0.000)	−0.475 (0.000)	0.226 (0.000)	−0.551 (0.000)					
7. Industrial specialization	0.352 (0.000)	0.207 (0.000)	0.277 (0.000)	−0.130 (0.023)	0.384 (0.000)	−0.466 (0.000)				
8. Major airport	0.375 (0.000)	0.207 (0.000)	0.355 (0.000)	−0.332 (0.000)	0.341 (0.000)	−0.166 (0.004)	0.104 (0.070)			
9. Port	0.083 (0.146)	0.111 (0.053)	0.148 (0.010)	−0.210 (0.000)	0.262 (0.000)	−0.322 (0.000)	0.166 (0.003)	0.015 (0.797)		
10. Rail connections	0.651 (0.000)	0.417 (0.000)	0.554 (0.000)	−0.114 (0.045)	0.565 (0.000)	−0.457 (0.000)	0.333 (0.000)	0.255 (0.000)	0.220 (0.000)	
11. Institutions	0.226 (0.000)	0.189 (0.001)	0.316 (0.000)	−0.152 (0.008)	0.227 (0.000)	−0.241 (0.000)	0.057 (0.316)	−0.051 (0.377)	0.304 (0.000)	0.269 (0.000)

Note: *p*-Values in parentheses; *N* = 307.



TABLE 3 Regression of competitiveness on the COE personality profile and EDI cultural profile for localities of Great Britain.

	Model 1	Model 2	Model 3
COE personality profile	5.193 (0.000)	5.451 (0.000)	5.613 (0.000)
EDI cultural profile	5.019 (0.000)	4.826 (0.000)	4.732 (0.000)
Cultural heritage			-0.003 (0.698)
Population density	0.134 (0.759)	0.021 (0.965)	-0.030 (0.951)
Industrial diversification	55.388 (0.000)	54.966 (0.001)	55.889 (0.001)
Industrial specialization	25.838 (0.000)	29.271 (0.000)	29.391 (0.000)
Major airport	4.023 (0.001)	4.223 (0.003)	4.057 (0.006)
Port	-2.786 (0.049)	-3.891 (0.016)	-4.007 (0.015)
Rail connections	0.104 (0.000)	0.102 (0.000)	0.102 (0.000)
Institutions	-1.847 (0.026)	-1.632 (0.090)	-1.620 (0.093)
Constant	114.775 (0.000)	115.890 (0.000)	116.304 (0.000)
Region dummies	Yes	Yes	Yes
Geographical coverage	GB localities	English localities	English localities
N	357	307	307
F-test	37.395 (0.000)	34.980 (0.000)	32.948 (0.000)
R ²	0.678	0.673	0.673

Note: *p*-Values in parentheses.

personality profile and EDI cultural profile with competitiveness. This fits with arguments suggesting that places with more people possessing entrepreneurial personalities are likely to undertake more entrepreneurial endeavours (Obschonka et al., 2013) and achieve higher levels of innovation (Lee, 2017). This might happen at the individual level, so that places high in personality profiles associated with COE will have higher levels of those people engaging in entrepreneurship (Obschonka et al., 2021; Rentfrow et al., 2008). However, it is also likely that in places where more entrepreneurial individuals are present, entrepreneurial and innovative endeavours and activities are legitimized through shared mental models (Denzau & North, 1994; Obschonka et al., 2015). Therefore, an EDI cultural profile would further enhance these activities and potentially overall competitiveness, and it is no surprise that the UKCI measure is also positively related to both the COE personality profile and the EDI cultural profile.



The COE personality profile is positively correlated with the UKCI Input Index ($\rho = 0.655$, $p = 0.000$), the UKCI Output Index ($\rho = 0.419$, $p = 0.000$) and the UKCI Outcome Index ($\rho = 0.361$, $p = 0.000$) in 2021. Similarly, the EDI cultural profile is correlated with the UKCI Input Index ($\rho = 0.632$, $p = 0.000$), the UKCI Output Index ($\rho = 0.519$, $p = 0.000$) and UKCI Outcome Index ($\rho = 0.422$, $p = 0.000$) in 2021. This fits with the proposition that the psychocultural foundations of localities do not only directly impact outcome competitiveness, but also impact on the knowledge-based inputs required for a locality to remain competitive. Such inputs include skilled and creative labour (Florida, 2002) and knowledge-based businesses seeking to locate in places where their activities are legitimized and supported, such as through access to venture capital (De Priecker et al., 2019).

Cultural heritage shows no significant relationship with the overall UKCI. This means that, in general, there is no evidence to support the argument that the presence of cultural heritage constrains development paths (Tubadji & Pelzel, 2015) and therefore the overall competitiveness of localities. However, those localities with the highest levels of cultural heritage are found to be associated with lower UKCI Outcome Indices ($\rho = -0.162$, $p = 0.004$), suggesting that the legacies of the past may impinge on contemporary development (Huggins, Stuetzer, et al., 2021). Tables 1 and 2 also indicate that the COE personality profile and EDI cultural profile are positively correlated, with cultural traits being likely to influence geographical differences in personality patterns (Rentfrow et al., 2008), and similarly with particular personalities reinforcing cultural patterns already present in localities (Huggins et al., 2018). Both are also likely to reflect the imprints left by historical development patterns (Holmes, 2006; Huggins, Stuetzer, et al., 2021; Stuetzer et al., 2016; Tabellini, 2010).

Following the correlation analysis, we regress the UKCI measures on the COE personality profile, EDI cultural profile and cultural heritage measures as well as controlling for other factors that might affect competitiveness. This indicates as to whether those localities with particular psychocultural patterns are more competitive and therefore better placed to grow economically in the future. As indicated by Table 3, the results again show positive relationships with the COE personality profile and EDI cultural profile. These relationships are significant for both the British localities (model 1) and the subset of English localities (model 2), and is unaffected when cultural heritage is controlled for (model 3). Other influences associated with competitiveness include both industrial diversification and specialization, highlighting the need for an exchange of ideas (Pede, 2013), the benefits of associated industrial clusters (Ascani et al., 2020; Porter, 2003), and related diversification (Balland, 2016; Balland et al., 2019; Kronenberg, 2012).

From an institutional perspective, better quality formal institutions at the local or regional level have been found to be positively related to entrepreneurship (Nistotskaya et al., 2015) and innovation (Rodríguez-Pose & Di Cataldo, 2015). Therefore, they would be expected to determine both past growth (Rodríguez-Pose, 2013) and future potential growth in terms of competitiveness (Annoni & Dijkstra, 2017). However, the results here suggest that after controlling for personality psychology and community culture, a negative relationship is found between formal institutions and competitiveness in Great Britain. This suggests that once the behavioural profile of a locality is considered, variation in the perceived efficiency of local public services is not positively related to competitiveness. Finally, transport links both nationally (rail connections) or internationally (airports) are significantly associated with competitiveness, suggesting that connecting people across places is an important contributor to local competitiveness.

5 | PUBLIC POLICY AND THE IMPLICATIONS OF BEHAVIOURAL THEORIES OF ECONOMIC DEVELOPMENT

From a policy perspective, the findings presented above strongly indicate that governments looking to 'level up' local and regional economies should pay greater attention to understanding the behavioural profiles of the localities and regions they are seeking to assist. The incorporation of behavioural theories of economic development are likely to yield a better understanding of the most effective mix of policies that will not just provide a short-term boost, but



will also help to limit any economic divergence both at the regional and local levels. Furthermore, given the persistence of the psychocultural foundations of a locality or region, policymakers also need to be realistic as to the extent to which levelling up is achievable, and to ensure that limited resources are deployed in an effective manner. It would appear that integrating behavioural thinking can play a role in this regard.

In general, public policies aimed at facilitating behavioural changes have become an increasingly marked feature across many nations, targeting a number of areas, especially health and wellbeing (Straßheim & Beck, 2019). Such behavioural public policy has the aim of influencing either individual or collective behaviour, particularly through insights from behavioural economics, behavioural sciences, psychology or neurosciences. This largely occurs through designing or re-designing the decision-making environment, which is commonly referred to as the ‘choice architecture’ (Straßheim & Beck, 2019). However, despite the adoption of a behavioural approach to policy in many areas, there has been little discussion of its role in the field of economic development, with the exception of certain policies in the Global South, and even less so in a local or regional context (Berndt, 2019; Lourenço et al., 2016). In terms of the analysis above, it can be argued that engendering and reproducing particular types of behaviour associated with the EDI cultural and COE personality profiles is likely to enhance local and regional competitiveness and economic development. To promote such behavioural change it is worthwhile to begin to consider those behavioural public policies closely associated with Thaler and Sunstein’s (2008) ‘nudge’ concept. Here the choice architectures people face are altered so that they are ‘nudged’ into selecting particular actions/behaviours. These are regarded as being preferable, either for the individual or for society at large, but at the same time do not prevent individuals from selecting their previous choices or altering the rewards associated with them (Thaler & Sunstein, 2008).

Prior to the prominence of nudges, the role of regulation and the provision of information were the foundations of behavioural public policy, and still play an important role. Regulation, as captured by research on institutions, functions by incentivizing or constraining particular forms of behaviour (North, 2005). Instead, nudges are focussed on how information is presented, while the provision of information itself remains within the remit of education, training and other learning environments (Berndt, 2019). This suggests that a suite of three levers is available from which to build behavioural public policies: (1) behavioural nudges; (2) institutional change; and (3) education systems. This raises the question: is it possible to provide local and regional development public policy interventions incorporating these three potential levers? We address each of them below.

5.1 | Behavioural nudges

So how can ‘nudges’ be conceptualized within this behavioural policy framework? One area clearly concerns policies that fall short of institutional changes but nevertheless seek to influence the attraction, selection, migration, sorting and matching of people and jobs. As behavioural economics suggests, many localities and regions, especially those with a legacy of evolutionary outcomes such as post-industrialism, need to redesign their choice architecture to ensure more high-quality matches in terms of the individuals and firms they are able to attract to boost competitiveness (Banczyk et al., 2018). For example, the role and use of individual regional champions and exemplars can be considered as nudge strategies as they make information available, personalize this information, and frame choices and options (Engelen et al., 2018).

In the context of local competitiveness and economic development, these agents of change can influence norms and standards and develop critical and creative capacities by forging new institutions and networks and catalysing the agency of others. In many contexts this has been shown to be instrumental in establishing the conditions for innovation and economic development by improving the use of knowledge inputs to boost competitiveness (Feldman, 2014; Wyrwich et al., 2019). Furthermore, nudges may come in the form of localities and regions accommodating and promoting disruptive agents who work against the underlying accepted psychoculture, with this dissonance engendering the forms of creativity, entrepreneurship and innovation that sparks productivity growth and economic development.



More generally, policies that do not consider the need for the presence of the COE personality and EDI cultural profiles run the risk of wasting public money. Institutional changes may consist of changes to the availability of and access to high-quality hard and soft infrastructure. In most cases, however, they should form part of a holistic policy framework that gives due consideration to behavioural policies related to nudge strategies and educational policies. To illustrate this, we draw on the example of investments made to foster entrepreneurship through the establishment of a series of business incubation facilities across the region of Wales in the United Kingdom, known as ‘Techniums’.

The Technium initiative can be considered as a laudable form of public policy initiative to promote the entrepreneurship and innovation that drives local and regional development. However, these investments appear to have been approved by public policy decision-makers with little regard to the behavioural profile of the places where they were built, or of the need for associated forms of support to ensure the success of these potentially valuable assets. As a result, there was little demand for many of these facilities, resulting in a number being closed down, and they are somewhat caustically labelled ‘Emptiums’ (Pugh et al., 2018).

A behavioural profile at the outset of the due diligence process for the Technium initiative would have given an indication that the doctrine of build and they will come is likely to have encountered significant challenges. Indeed, a deeper analysis of the type undertaken in the previous section of this paper would indicate a lack of individuals with a motivation or aspiration to engage in the type of entrepreneurship in the localities being promoted by the Techniums. In addition, the cultural histories of the areas where the Techniums were located made them unlikely to be able to quickly adapt to the new forms of innovation-based development they were seeking to enable (Huggins & Thompson, 2016). Therefore, Techniums were the type of hard infrastructure investment that might be envisaged as part of levelling up policies, but they are unlikely to boost competitiveness in any long-term or meaningful manner unless they form part of a more holistic series of investments and policy interventions that support the type of behavioural change required to stimulate demand for these facilities.

More detailed thought should have been undertaken of the processes required to engage local individuals in establishing the types of start-up businesses that Techniums were presumably seeking to have as tenants. Although these developments occurred some years ago, with many Techniums closing their doors in 2010, a behavioural lens on this form of public policy provides significant lessons and a warning for those leading the current charge for levelling up. In respect of these types of policies, Potts and Morrison (2009) have analysed the role of nudges in the form of one-off initiatives such as innovation vouchers and the like as a means of overcoming issues of risk and loss aversion – and in effect, bounded rationality – when individuals consider engaging with innovation services and infrastructure. This work, therefore, similarly indicates the value of a behavioural lens on development policy.

5.2 | Institutional change

Institutional changes are adaptations to the humanly devised constraints, both formal (*de jure*) – rules, laws, constitutions – and informal (*de facto*) – norms, behaviour, conventions – constraints and their enforcement, which then define the incentive structure of societies and their economies (North, 2005). In effect, institutions, in the shape of both the tangible and intangible characteristics constituting the functioning of places, are either enablers or constrainers on development. As Glückler and Lenz (2016) outline, institutional changes can have a number of differing effects, such as reinforcing, circumventing, or substituting existing rules, as well as the generation of competing rules. Regions and localities with institutions conducive to enabling economic development are likely to increase their growth by attracting investment, skills and talent. Some examples include: local business regulations that allow commercial activity to be efficient; the ease of doing business; local government initiatives; and ultimately the behavioural perceptions of businesses and individuals (Crouch et al., 2009; Rodríguez-Pose, 2013).

As previously indicated, many studies on the impact of institutions on local and regional development have focussed on their formal elements (Rodríguez-Pose, 2020). However, it may be through more informal institutions in



localities and regions whereby the most radical changes can be levered and triggered (Rodríguez-Pose, 2013). In this sense, local and regional institutions impacting upon competitiveness consist of the underlying rules of the game relating to factors such as the incentives to save and invest; embrace competition, innovation and technological development; engage in entrepreneurship; and participate in networks. In summary, institutional changes may have significant impacts on behavioural choice architectures through adaptations to the incentives and constraints to engage in particular forms of activities.

5.3 | Education systems

Education systems refer to the way in which learning environments are attuned to create long-term behavioural changes within regions and localities. These systems can be used to encourage the development of individuals who are more willing to express themselves, question rules and be open to new ideas. Such programmes should be embedded within the citizenship and creativity elements of the curriculum (Tonge et al., 2012). Studies of entrepreneurship education have often advocated the use of entrepreneurs to act as role models (Kwong et al., 2012). An important behavioural concept in this respect is the notion of 'locus of control'. This refers to the extent to which individuals consider that their own decisions control their lives – internal locus of control – or in the hands of external factors relating to chance, fate or the wider environment (Kerr et al., 2018). Therefore, the locus of control is likely to be a psychoculturally dependent trait (Kerr et al., 2018). This indicates that the actualization of potential agency will only be significantly mobilized if certain psychocultural conditions are in place. Whitehead et al. (2014) suggest that such conditions are related to the nature of the 'psychological capital' contained within a place. This comes in the form of key personal attributes including confidence, optimism, perseverance and resilience, coupled with a better sense of appreciation and understanding of the actions and agency of others. Given this, the nature of local and regional education systems is undoubtedly likely to be an important determinant of long-term competitiveness (Gorodnichenko & Roland, 2017; Martin & Sunley, 2015).

In localities and regions that possess relatively low levels of the COE personality profile and/or EDI cultural profile, assignment projects for young people associated with commercializing innovative and entrepreneurial ideas would provide a legitimizing environment. Furthermore, changes that reduce the costs of education or increased provision of free support for students would only be beneficial to long-term development. Although universities have a relatively successful record in embedding enterprise support functions in their activities, government at all levels should play a more proactive role in generating the supportive culture that is lacking in many localities and regions.

6 | CONCLUSIONS

No one can fault the ambition of levelling up policy agendas in assisting left-behind localities and regions and seeking to improve the quality-of-life of the future generations living in these places. However, there is a very strong possibility that these policies may fail to fulfil their potential if the fundamental behavioural foundations of economic development are ignored. Clearly, the key levers of economic development consist of factors such as skills, infrastructure, machinery, equipment, research and development, the leadership and managerial capability of firms, and the role of policy at multiple levels in shaping the capacities associated with each lever (McCann, 2016; McCann & Vorley, 2020). While this is undoubtedly the case, this article argues that differences in human behaviour across places, based on the psychological and cultural profiles of these places, play a complementary role in understanding uneven development and the means of addressing it. The determination of spatial economic divides is a highly complex area that a myriad of scholars continues to explore. Within this framework, a greater appreciation of the human behavioural profile of a place can potentially provide a vital cog in stimulating local and regional economic



development through a more integrated series of investments and policy interventions compared with the more fragmented approaches of the past.

From a scholarly perspective, the adoption of a behavioural approach to regional analysis may provide a powerful means of addressing a number of the often unknowns within explanations of uneven development across localities, cities and regions. Such a behavioural approach can encompass some of the hidden, yet embedded, cultural factors that can either facilitate or constrain contemporary local and regional development. Furthermore, it can help account for the influence of the movement of individuals possessing certain personality traits from one location to another on such development. Regional analysis has begun to take seriously the impact of differences in institutional factors on differing rates of local and regional development. This is a significant step forward, but it should be remembered that institutions, be they formal or informal, are all humanly devised. Therefore, the inclusion of a behavioural examination of regions and localities is likely to provide insights on the types of institutions that are likely to originate, endure and prove effective in particular locations. Finally, it is clear that such insights can only be generated if there are robust data on human behaviour at a sub-national level. Therefore, our plea to policymakers is to support the research community in developing such datasets that will provide a rich basis for addressing growing rates of uneven development and helping nations truly 'level-up'.

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APPENDIX A

TABLE A1 Underlying data for measures related to the local cultural profile.

Variable	Description and source
Engagement with employment and education	<ul style="list-style-type: none"> Male economic activity rates from the 2010 Annual Population Survey (APS) Inverse of the proportion of the population with no education 2010 (APS) Days of absenteeism at primary and secondary schools in 2009 (Schools' Statistics)
Social cohesion	<ul style="list-style-type: none"> Measures of homogeneity in terms of ethnic similarity and religious similarity in 2011 (Census data) Gross migration in 2010 (National Health Service Central Register) Proportion of the population born abroad in 2010 (APS) Proportion perceiving themselves to be of the nationality of the resident country (for example, English in English localities) (APS)
Feminine and caring	<ul style="list-style-type: none"> Female economic activity in 2010 (APS) Proportion of female employment that is part time in 2010 (APS) Proportion of population undertaking caring activities that are unpaid in 2011 (Census)
Adherence to social rules	<ul style="list-style-type: none"> Age-adjusted alcohol related deaths in the period 1998–2004 (Health Statistics Quarterly) Younger age conceptions in 2009 (Health Statistics Quarterly) Reported nonsexual violent crimes per capita in 2009 (notifiable crimes recorded by the police) Reported crimes by deception per capita in 2009 (notifiable crimes recorded by the police)
Collective action	<ul style="list-style-type: none"> Trade union membership in 2010 (APS) Proportion voting for parties with left of centre leanings in 2010 (Electoral Commission)

TABLE A2 UK competitiveness indicators included in the analysis.

Input factors
Business start-up rates per 1,000 inhabitants
Number of business per 1,000 inhabitants
Proportion of working-age population with National Vocational Qualification (NVQ) level 4 or above
Proportion of knowledge-based businesses
↓
Output factors
Gross value added per head at current basic prices
Productivity – output per hour worked
Employment rates
↓
Outcome factors
Gross weekly pay
Unemployment rates



TABLE A3 Controls included in the regression analysis.

Type of control	Variable	Description	Data source	Inspiration for control
Population distribution – capturing market size and distribution and access to knowledge sources	Population density	1,000 population per square km	NOMIS Mid Year Population Estimates (2010)	Kitsos and Bishop (2018); Garcia-Alvarez-Coque et al. (2021)
Industry structure – capturing the influence of clustering and related diversity effects.	Industry diversification Industry specialization	Theil's (1972) entropy measure is generated from four-digit SIC07 employment data. Relative specialization index generated from four-digit SIC07 employment data	Annual Business Inquiry (2010) Annual Business Inquiry (2010)	Pede (2013); Fotopoulos (2014); Balland et al. (2019) Fotopoulos (2014); Ascani et al. (2020); Balland et al. (2019)
Transport connections/ infrastructure – capturing flows of people embodying aggregate demand and knowledge	Major airport Port Rail connections	Close proximity (25 miles) to a major airport (serving at least 4 million passengers in 2008) Primary maritime port (handling at least 1 million passengers or 25 million tonnes of freight in 2002) Gross number of train journeys (both inbound and outbound) scaled by the population	Department for Transport (2008) Department for Transport (2002) Department for Transport/Office of Rail Regulation (2010)	Bathelt et al. (2004); Cox and Davies (2013); Martin et al. (2016) Bathelt et al. (2004); Cox and Davies (2013); Martin et al. (2016) Bathelt et al. (2004); Cox and Davies (2013); Martin et al. (2016)
Institutional environment – capturing support for formal institutions for transactions and interactions	Institutions	NUTS1 Quality of Government index adjusted for local factors. Originally based on surveys of satisfaction with health care, education and law enforcement, these are adjusted using performance measures from a number of UK sources to provide local measures.	Quality of Government Index; Home Office Statistics and Scottish Policing Performance Framework; NHS (National Health Service) England, National Survey for Wales, 2013–14—Health—experience of GP services and Scottish Health and Care Experience Survey; Her Majesty's Inspectorate of Constabulary and Scottish Policing Performance Framework; Department for Education, Schools Census results; Summary Statistics for Schools in Scotland; Office for Standards in Education, Children's Services and Skills (Ofsted), Estyn and School Estate Statistics	Charron et al. (2014); Nistotskaya et al. (2015); Rodriguez-Pose and Di Cataldo (2015); Huggins and Thompson (2016)