Existential threats of immigration and terrorism predict voting for Brexit and Trump

Corresponding author:

Dr. Alyson E Blanchard[a] (alyson.blanchard@bishopg.ac.uk)
https://orcid.org/0000-0003-0449-0425

Affiliated authors:

Dr. Fraenze Kibowski[b]
Dr. Thomas J Dunn

[a]Department of Psychology
Bishop Grosseteste University
Longdales Road
Lincoln
LN1 3DY
UK

[b]Department of Psychology
Nottingham Trent University
Chaucer Building
Shakespeare Street
Nottingham
NG1 5LT
UK

Abstract

2016 witnessed historic political change with the ascension to power of Donald Trump and the UK's vote to leave the European Union (i.e., Brexit). Research has sought to explain these once-deemed unlikely events, yet an evolutionary theoretical account remains unexplored. From a life-history perspective, a rise in existential threat, potentially caused by increased media coverage of the War in Syria and immigration issues, may have prompted a shift to a faster life-history strategy (LHS)/pace of life syndrome (POLS). Immediate answers were sought despite long-term consequences. In this multiple study paper, we shed light on this thesis. Firstly, in establishing a perceived increase in existential threats between 2014 and 2016. Secondly, by examining if LHS/POLS and associated proxies, as well as fear of terrorism and immigration predicted voting for Brexit or Trump. Trump voters feared terrorism, and Brexit voters feared immigration, but LHS/POLS was not directly, nor ultimately influential in their vote choice, however, for those that did not vote, it was. Nevertheless, other life-history proxies were important factors in voting. Thus, the link between LHS/POLS and voting is complex but affords new insight into voter psychology during the EU referendum and US presidential election.

The U.K. vote to leave the European Union (E.U.) in the 2016 Referendum was unexpected. Politicians, journalists and financial markets, up until the exit polls, had predicted a safe win for remaining in the E.U. Also stupefying was the outcome of the U.S. Presidential Election the same year in which Donald Trump, a business man and celebrity with no previous political experience became the world's most powerful head of state. Seemingly, a seismic shift in public conscience had gone undetected. Explanations for this shift have since been attempted by commentators and researchers, citing terrorism and immigration as key determinants. Yet such existential threats had always permeated public awareness as menaces to life and resources, which leads to the question: what was different this time to prompt a change so considerably removed from the status quo? Many studies have examined factors such as personality traits and demographic profiles in voting behaviour, however what has yet to be considered is whether these factors can be contextualised with in an evolutionary perspective. Although not immediately apparent, an evolutionary theoretical framework might help to explain why outcomes previously thought unlikely became eventualities.

Life-history theory and pace of life syndrome

Life history theory (LHT), a mid-level evolutionary theory, describes how reproductive development and scheduling is shaped according to environmental conditions (Hill, 2005; Kaplan & Gangestad, 2004). LHT describes how organisms perform a series of resource allocation trade-offs. Only a finite amount of energy is available from the environment and so it is necessary to allocate this energy optimally either to somatic or reproductive effort (MacArthur & Wilson, 1967). In environments in which existential threats are high and long-term survival is unlikely, energy spent on mating effort and producing a high number of lower quality offspring is adaptive. In this case, a fast life history strategy (LHS) characterised by: faster maturation; earlier age of puberty and reproduction; more children; and reduced parental investment is the most adaptive phenotypic response to the environment (Pianka, 1970). Conversely, a slow LHS emerges in low existential threat environments that are safe and in which resources are reliably available. Slower maturation, decreased mating effort and increased parental investment producing less offspring but of better quality is optimal.

LHT was originally used to explain non-human animal behaviour, however more recently, it has been utilised in explaining human "bio-demographics" and psychology (for a review, c.f. Black, Figueredo, & Jack Jacobs, 2017). Research shows that stressful home environments are associated with earlier onset of puberty, sexual relationships and age at first child, and is mediated by further indicators of environment quality such as attachment type, maternal mental health and father absence, which would indicate a fast LHS (Belsky, Schlomer, & Ellis, 2012; Draper & Harpending, 1982; Dunkel, Mathes Kesselring, Decker, & Kelts, 2015;

Moffitt, Caspi, Belsky, & Silva, 1992; Simpson, Griskevicius, Kuo, Sung, & Collins, 2012; Szepsenwol, Simpson, Griskevicius, & Raby, 2015). The importance of these formative experiences is indicated by their long-reaching influence into adulthood. Low childhood socio-economic status predicts risk-taking and delayed gratification behaviours in adults, although this relationship is subject to current environmental circumstances such as mortality salience, resource scarcity, and the ability to control such factors (Griskevicius, Delton, Robertson, & Tyber, 2011; Griskevicius et al., 2013; Mittal & Griskevicius, 2014; Pepper & Nettle, 2013). Thus, individuals brought up in an environment where resources were scarce and unpredictable will favour short-term gains when they are faced with a similar scenario in adulthood.

Individual differences in LHS phenotypic variability beyond biological changes necessary for shaping an individual's reproductive scheduling are captured by pace of life syndrome (POLS), which describes the unique constellation of co-varying personality traits and behaviours that function together in facilitating a LHS (Dammhahn, Dingemanse, Niemelä, & Réale, 2018; Nettle & Frankenhuis, 2019). For example, personality traits such as conscientiousness, anxiousness, and fearfulness are associated with slow LHS. Conversely, expressiveness, enthusiasm, social aptitude, as well as being domineering, critical and neurotic are characteristic of fast LHS (Sherman, Figueredo, & Funder, 2013; Young, Simpson, Griskevicius, Huelsnitz, & Fleck, 2017). There is also a plethora of research that has examined the potential adaptive characteristics of traits usually associated with adverse outcomes such as psychopathy and borderline personality disorder, as in fact operating as fast LHSs in which being manipulative, impulsive or emotionally unstable foster multiple mating opportunities and resource acquisition at the expense of trusting conspecifics (Brüne, 2016; Mealey, 1995). As such, personality styles and their associated behavioural outcomes effectively function as an individual's psychological out-put of their LHS. From this it is possible to explain and predict personality and behaviour in reference to the status of the environment.

Considering the adaptive value of phenotypic plasticity, it is arguable that the ability to bet hedge in response to the environment retains fitness advantages beyond adolescence. Wilson & Daly (1997) suggest that "the human psyche produces what is in effect a semi-statistical apprehension of the distribution of local lifespans, based on the fate of other relevant people" (p. 1274). Such responsivity is crucial for optimal parental investment in which parents have to adaptively manage the demands of their offspring (Trivers, 1972). Parental care is adaptive when it increases offspring survivability and/or quality. However, in resource-challenged situations reducing or abandoning offspring duties altogether is adaptive in the face of diminished fitness payoffs. Pennington & Harpending (1988) describe this saturation point as the "S_{max}" and is demonstrated in a

number of studies. For example, animal studies show that in times of food scarcity parents engage in infanticide and cannibalism in favour of their own calorific needs or a stronger sibling who is more likely to survive (c.f. Hrdy, 1979 for a review). Mothers may abort pregnancy in resource challenged or dangerous situations (Hrdy, 1979). Similar outcomes are evidenced in human populations. For example, single young women are more likely to abort a pregnancy compared to older single women and married women because securing a partner who can provision and share child rearing responsibilities will likely increase the quality of her child (Lycett & Dunbar, 1999). Low socioeconomic status is associated with infanticide (Baek, Lim, Kim, & Yoon, 2019) and reduced parental care (Belsky et al., 1991; Belsky et al., 2012), whilst parental care decreases in response to pathogen stress (Quinlan, 2007). As originally demonstrated by Harlow's seminal experiments on rhesus macaques (c.f., Champagne, 2008), harsh parenting practices can arise in sub-optimal conditions (Pinderhughes, Nix, Foster, & Jones, 2001). Whilst the behavioural outcomes for the child developing in an environment of maternal deprivation may seem detrimental, anxious or avoidant attachments might be of advantage in hostile environments in which conspecifics cannot be trusted. Indeed, there is even evidence for "fetal programming" whereby testosterone levels in the womb fluctuate in response to maternal experience, prompting neurobiological development better suited to stressful environments (Barker, 1992). Thus, considering that children are dependent on parents for cues of environmental conditions then it is necessary for that parent to be responsive to the environment in the first instance. Even though there is a substantial genetic contribution to LHS (Figueredo, Vásquez, Brumbach, & Schneider, 2004; Figueredo & Rushton, 2009) and that the influence of the environment is greater in childhood, there is scope to consider that potentially some phenotypic plasticity perseveres into adulthood. That is, whilst LHS in terms of reproductive scheduling has already been determined before adulthood, an individual's POLS may adjust according to current environment conditions for the purpose of optimal child rearing.

Antecedent factors in voting for Brexit and Trump

Considering the unexpected wins for both leaving the E.U., and Trump and the preceding years of relative stability, raises the question as to what could have caused such a dramatic shift in people's political outlook? In ancestral times personal experience and communication with kin and conspecifics (Dunbar, 1998) provided a summary of existential threat, however people now rely on the media for this information. Crucially, in the lead up to the 2016 E.U. Referendum and U.S. Presidential Election there was considerable media coverage of the War in Syria and the terrorist organisation Islamic State (IS) (Satti, 2015; Zhang & Hellmueller, 2017), and in particular their propaganda videos utilising the "about to die" trope (Winkler, El Damanhoury,

Dicker, & Lemieux, 2016; Zelizer, 2018), which is considered particularly horrific in Western society (Tracy & Massey, 2012). The potential for psychological impact from such exposure is demonstrated in various studies evidencing the relationship between news coverage of terrorist attacks and anxiety (Ben-Zue, Gil, & Shamshins, 2012; Shoshani & Slone, 2008; Slone, 2000), distress (Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002), threat perception (Rubaltelli & Pittarello, 2018), reduced trust (Giordano & Lindström, 2016), support for military intervention (Soroka, Loewen, Fournier, & Rubenson, 2016; Gadarian, 2010), increased respect for authority (Tamborini et al., 2017), and outgroup prejudice (Das, Bushman, Bezemer, Kerkhof, Vermeulen, 2009). Furthermore, news coverage of the ensuing European "refugee/immigration crisis" channelled the same fears, contextualising the crisis in terms of socio-economic impact, cultural dilution, loss of border control and chaos (Balch & Balabanova, 2016, Lawlor, 2015, Pruitt, 2019). Images of over-crowded boats crossing the Mediterranean prompted analogies of water-related disquieting wording such as "flood", "wave", "tide", "stream" and "deluge" (Pruitt, 2019). Insect infestation and disease related metaphors (e.g., "swarms" (Esses, Medianu, & Lawson, 2013; Torkington & Riberiro, 2019)) also contributed to adversarial commentary, such as the "Breaking Point" poster of the UK Independence Party (UKIP) (Pruitt, 2019). The U.S. was not exposed to the Syrian refugee crisis, however the ongoing reporting of Mexican immigration was framed within the same political and economic issues and utilised the same infestation narratives (Fryberg, Stephens, Covarrubias, & Markus, 2012; Kinefuchi & Cruz, 2015; Korte & Gomez, 2018; Merolla, Ramakrishnan, & Haynes, 2013). Crucially then, from 2014 which marks the point at which the War in Syria and associated refugee/immigration crisis started receiving considerable media coverage and in the lead up over the next two years until the E.U. Referendum and U.S. Presidential Election in 2016 people were subjected to a "double whammy" of chronic existential threat-relevant information. It is possible that the extent of this exposure over the course of two years may have prompted personality and behavioural change in people indicative of a present-time orientated POLS. Essentially, people started to discount the future in favour of what promised to be the most immediate and simplistic solution to their problems, i.e. "Make America Great Again" and "Let's Take Back Control". Research even shows that people were aware of long-term costs of their vote choice. 61% of Brexit voters said that significant damage to the British economy was worth the cost of leaving the E.U., and 39% said that they were happy to lose, or for a family member to lose their job as a consequence of Brexit (Smith, 2017).

Furthermore, people who voted Brexit or Trump may have already been situated towards the fast end of the LHS/POLS spectrum. Brexit voting areas were characterised by low GDP, low education, strong net immigration and economic decline due to industrial globalisation (Ipsos MORI, 2016). The E.U. referendum

also allowed Brexiteers, disenfranchised by the U.K.'s "first past the post" electoral system, to use their vote as a one-time point of protest (Arnorsson & Zoega, 2016; Mason, 2016; Goodwin & Heath, 2016). Brexit voters were also low in European identity and high in British identity; reported greater "realistic" and "symbolic" threat; and viewed politicians as untrustworthy and the world as more dangerous and uncertain (Abrams & Travaglino, 2018; Swami, Barron, Weis, & Furnham, 2018; Van de Vyver, Leite, Abrams, & Palmer, 2018). Similarly, Trump voters were predominantly conservative; white; from rural areas or small cities; and were low educational achievers, anti-elitist and distrusting of experts, and high in American identity (Rahn & Oliver, 2016). They perceived the country to be in an economically poor state, with immigration and terrorism as the most important issues facing the U.S., and that Donald Trump was honest and trustworthy (Huang, Jacoby, Strickland, & Lai, 2016). Potentially, Brexit and Trump voters were already sensitive to existential threats and were thus predisposed to short-term answers to their problems.

The current study

The central research question for this study is whether people experienced a shift in POLS as a response to an increasingly uncertain and hostile environment that had advanced during the time period between 2014 and 2016, and if an outcome of this shift culminated in a vote to leave the E.U. in the U.K. or for Trump in U.S. To explore this research question, a preliminary study was run in order to establish that people had perceived an increase of existential threat between the period before 2014 and the period between 2014 and 2016 leading up to the E.U. Referendum and Presidential Election of 2016. The following predictions are proposed:

P1a: Individuals from the U.K. and U.S. will report an increase in existential threat in the specified time periods.

P1b: Individuals who voted Brexit and Trump will report more of an increase in existential threat in the specified time periods compared to those that voted Remain or Clinton.

In light of literature, the following further predictions are proposed:

P2: Faster LHS/POLS increases the likelihood of voting for Brexit and Trump compared to voting to remain in the E.U. and for Hilary Clinton (in the UK and US respectively).

P3: Individuals from the U.K. who voted Brexit and individuals from the U.S. who voted for Donald Trump will consider themselves under greater threat of terrorism and more vulnerable to disease compared to those who did not vote for Brexit or Trump. Here, considering how concepts of disease are associated with

immigration (Esses, Medianu, & Lawson, 2013; Torkington & Ribeiro, 2019), vulnerability to disease is considered as a proxy for fear of immigration.

P4: Brexit and Trump voters will also report being higher in characteristics proxy to a fast LHS/POLS (e.g., low childhood socio-economic standing, impulsiveness, sense of control, and sociosexuality).

Study 1

Method

Participants

Two hundred and thirty-six participants (139 women, 97 men; M_{age}:40.54, $SD = 13.00$) were recruited from two online crowd-sourcing websites (Crowdflower and Prolific) specifically targeted at individuals from either the U.K (122 participants) or the U.S (114 participants). 83% were White, 8% Mixed/Multiple ethnicity, 15% Asian/Asian American, 10% Black, 3% Native American, and 3% were Hispanic.

Measures

Existential threat. A measure consisting of 9 items was created to tap into participants' recollection of existential threat between 2014 and 2016. They were asked, using a seven-point Likert scale (*1* = "considerably less", *4* = "had stayed the same", *7* = "considerably more") "to compare the time before 2014 to the two years leading up to the 2016 E.U Referendum/U.S Presidential Election". Example items include "Your livelihood was under threat", "Your physical health was under threat" and "Your safety was under threat". Ratings were summed to produce an overall score ($M = 37.75$, $SD = 7.09$). The measure demonstrated good reliability ($\alpha =$ .83).

Results

The mean perceived change in existential threat in the sample reflects that of an increase from before 2014 to the two years leading up to the 2016 E.U. Referendum/U.S. Presidential Election ($M = 37.75$, $SD =$ 7.09). A one-sample t-test was used to compare the mean change score in the sample to a hypothetical population mean equivalent to 'no change' (i.e., the score expected if all items in the scale had been rated "Had stayed the same" [i.e., $M = 36$]). A significant difference was found between scores ($t (235) = 3.79$, $p < .001$) demonstrating that participants had rated existential threats to have increased between the time before 2014 and in the two years after, thereby supporting P1a. Furthermore, Brexit and Trump voters ($M = 39.04$, $SD = 7.22$) reported significantly more existential threat in the time period than those that voted to remain in the E.U. or Hilary Clinton ($M = 37.06$, $SD = 6.74$) ($t = 2.08$, $p < .05$), thereby supporting P1b.

Study 2

Method

Participants

Participants were recruited via Crowdflower, an online crowd-sourcing company, specifically restricted to the United Kingdom or United States accordingly and were paid $1 for their time.

One hundred and fifty-four participants (78 women, 75 men, 1 non-binary; M_{age}:40.50, $SD = 11.68$) took part in the E.U. Referendum study, of which 91% were White, 2.6% were Mixed/multiple ethnic, 3.8% were Asian/Asian British, .6% were Black/African/Caribbean/Black British, and .8% were non-specified. 10.9% were educated to GCSE, 32.1% to A-Level/BTEC, 50% to degree, and 6.3% to college level. 63.8% voted to remain in the EU, whilst 36.3% voted to leave the EU.

In the U.S. Presidential Election study, two hundred and eighty-nine participants (159 women, 128 men, 2 non-binary; M_{age}:37.91, $SD = 13.49$) took part, 79.6% of which were White, 8% Black/African American, 6.2% Asian/Asian American, 1.4% Native American, and 4.8% Hispanic. 1.7% were educated to below high-school, 15.9% completed high school, 29.8% achieved a college or associate's degree, 38.4% achieved a bachelor's degree, and 14.2% an advanced degree. 38.4% voted for Trump, 44.6% voted for Clinton and 17% voted for neither candidate.

Participants were asked for their postcode/zip code for the purpose of identifying the extent of deprivation in their local area (Index of Multiple Deprivation (U.K.)/Area Deviation Index (U.S.)), however for the UK sample insufficient accurate postcodes were provided and therefore deprivation was excluded from the EU Referendum data analyses. Higher scores reflect a higher percentage of people living in poverty in a given zip code.

Measures

The K-SF-42: Short form of the Arizona Life History Battery (Figueredo et al., 2017). The K-SF-42 is a self-report questionnaire consisting of 42 items that measure an individual's "behavioural and cognitive indicators of LH resource allocations among different domains of fitness" (p. 2) such as insight; planning and control; family social contact and support; general altruism; and religiosity. Items include "I'm a very religious person" that are rated on a 7-point Likert scale (3 = disagree strongly, $+3$ = agree strongly), and "How much did your biological mother teach you about life", rated on a 4-point Likert scale (0 = not at all, 3 = a lot). Higher scores indicate a slower life-history strategy. As per recent discussions in the literature (Nettle & Frankenhuis,

2019), in this context LHS as measured by the K-SF-42 will be subsequently referred to as LHS/POLS as it concerns the psychological and behaviour manifestations of LHS, rather than reproductive scheduling.

Perceived threat of terrorism (Bilali, 2015). A 6-item, self-report questionnaire in which higher scores indicate a higher perceived threat of terrorism. Items such as "I personally feel at risk for being a victim of a terrorist attack" and "Threats toward the U.K./U.S. from diverse groups are imminent" are rated on a 5-point Likert scale (*1* = disagree strongly, *5* = agree strongly).

Perceived vulnerability to disease (Duncan, Schaller, & Park, 2009). A 15-item, self-report measure in which items such as "My hands do not feel dirty after touching money", and "It really bothers me when people sneeze without covering their mouths" are rated on a 5-point Likert scale (*1* = disagree strongly, *5* = agree strongly). Higher scores indicate a greater vulnerability to disease.

Fear of crime (Callanan & Teasdale, 2009). Participants indicate their concerns about eight different crimes (e.g., car stolen, attacked with a weapon) on a Likert scale (*1* = not at all worried, *5* = very worried). Greater fear of crime is reflected in a higher score.

Barratt Impulsiveness Scale (BIS-11) (Patton, Stanford, & Barratt, 1995). Participants rate 30 items such as "I change hobbies" and "I concentrate easily" on a 4-point Likert scale (*1* = rarely, *4* = almost always/always) that are summed together whereby higher scores indicate greater impulsiveness.

Sense of control (Lachman & Weaver, 1998). A four-item, self-report measure consisting of a series of statements such as "I can do just about anything I really set my mind to" that participants rate on a 7-point Likert scale (*1* = strongly disagree, *7* = strongly agree). Greater sense of control is indicated by a higher score.

Childhood socioeconomic standing (Griskevicius et al., 2011). This self-report measure is rated on a 7-point Likert scale (*1* = disagree strongly, *7* = agree strongly), and consists of 3 items such as "I grew up in a relatively wealthy neighbourhood". Higher childhood socioeconomic standing is indicated by a higher score.

Revised Sociosexuality Orientation Inventory (SOI-R) (Penke & Asendorpf, 2008). The SOI-R is a self-report 9-item questionnaire that uses a 9-point Likert scale to measure willingness to engage in casual and uncommitted relationships. Participants are asked about past sexual behaviour (number of partners and one nightstands), sexual attitudes (e.g. enjoyment of casual sex) and sexual desire (frequency of arousal by strangers).

Results

Table 1 and Table 2 present the descriptive and reliability statistics, and zero order correlations for both the E.U. referendum and U.S. presidential election.

Table 1

Descriptive statistics for all variables

	E.U. Ref.		U.S. Pres. Elec.			
	M(SD)	α	*M(SD)*	α	*t*	*d*
Life history strategy (LHS/POLS)	-6.21(16.67)	.83	7.46 (20.24)	.89	-7.18***	.74
Threat of terrorism (TER)	27.9 (8.04)	.86	27.22 (8.19)	.85	.84	.08
Vulnerability to disease (DIS)	57.34 (12.48)	.76	60.52 (10.86)	.66	-2.79**	.27
Childhood socioeconomic standing (CSES)	23.5 (7.70)	.81	25.00 (8.18)	.84	-1.87	.19
Fear of crime (CRI)	18.44 (8.44)	.93	20.33 (8.35)	.93	-2.25*	.23
Impulsiveness (IMP)	62.52 (10.82)	.84	64.36 (12.12)	.86	-1.58	.16
Sense of control (SOC)	20.01 (4.96)	.90	20.96 (4.59)	.87	-1.86	.20
Socio-sexuality (SOS)	31.50 (13.08)	.85	33.24 (15.44)	.88	-1.19	.12

*p < .05

**p < .01

***p < .001

Table 2

Zero order correlations

	TER	DIS	CSES	CRI	IMP	SOC	SOS
LHS/POLS	.05/.32**	.06/.24**	.14/.23**	.14/.29**	-.07/.02	.32**/.39**	.05/-.01
TER		.25**/.36**	-.18*/.09	.41**/.46**	-.02/-.02	.01/.23**	-.09/.04
DIS			-0.3/.03	.46**/.38**	.22**/.12*	-.26**/.07	.02.17**
CSES				-.19*/.09	-.10/.16**	.14/.20**	.06/.21**
CRI					.09/.29**	0/.03	.10/.18**
IMP						-.28**/-.31**	.23**/.41**
SOC							.08/-.12

E.U. referendum results are above the slash, U.S. presidential elections are below the slash

*p < .05

**p < .01

**p < .001

EU Referendum

A binary logistic regression was run in SPSS with predictor variables LHS/POLS, threat of terrorism (TER), vulnerability to disease (DIS), childhood socioeconomic standing (CSES), fear of crime (CRI), impulsivity (IMP), sense of control (SOC), sociosexuality (SOS); control variables age, sex, and education, and binary outcome variable remain/leave vote for Brexit.

The overall model significantly predicted the remain/leave decision ($\chi2$ (12) = 35.322; $p < 0.001$). However, only individuals who felt that they were vulnerable to disease were more likely to vote leave compared to remain (thereby supporting P3 but not P2). Furthermore, age and education were significant control variables, with a higher age predicting a greater likelihood and a higher education predicting a lower likelihood of voting leave compared to remain (see Table 3 for all OR and standardised beta results for the model). Model fit was assessed using McFadden's (1974) R^2 index (which captures the ratio of fitted model maximum likelihood to null model maximum likelihood value). This resulted in an R^2 index of .16 which can be interpreted as a good fit of the data (values between .2 and .4 are considered excellent fit, Louviere, Hensher, and Swait, 2000). The predictive ability of the model was evaluated by counting instances of correct classification, using a subset of data not employed in model specification. The model allocated individuals (from the sub-sample) to the correct class 75% of the time. Lastly, a ROC curve of true-positive rate against false positive rate was plot. This resulted in an AUC of .76, suggesting good predictive ability of the model.

It was interesting to note that from the correlational analyses, some of the life history variables (TER, CRI, IMP, & SOC) were significantly related to vulnerability to disease suggesting an indirect effect of the non-significant life-history variables on the remain/leave vote through disease vulnerability. This path model (Table 4) was tested in Mplus (version 8) with N=154 and estimator WLSMV. Only CRI and SOC significantly predicted DIS, such that higher fear of crime led to increased perceived vulnerability to disease, and a greater sense of control led to a reduction in perceived vulnerability to disease. Higher perceived vulnerability to disease in turn led to a greater likelihood of voting leave compared to remain (Table 5).

Education and age were significant predictors as per the binary logistic regression above (higher age predictive of leave compared to remain, and higher education predictive of less likely to leave compared to remain) (Table 5). The variance explained in vulnerability to disease was 32.1% ($p < 0.001$), and in vote choice it was 27.0% ($p < 0.05$). Overall, the results partially provide support for P4.

Table 3

Odds ratios and standardised regression coefficients from logistic regression

	Brexit compared to remain					
	OR	*B*	*SE*	*p*	95% CI	
LHS/POLS	1.001	.001	.013	.916	-.024	.026
TER	1.056	.060	.029	.060	.003	.117
DIS	1.042*	.041	.021	.046	0	.082
CSES	0.995	-.005	.027	.845	-.058	.048
CRI	0.959	-.042	.030	.166	-.1	.017
IMP	1.001	.001	.020	.960	-.038	.04
SOC	0.964	-.037	.047	.430	-.129	.055
SOS	1.006	.006	.017	.733	-.027	.039
Deprivation	n/a	n/a	n/a	n/a	n/a	n/a
Education	0.509**	-.675	.194	.001	-1.055	-.295
Gender	0.967	0.113	0.084	.180	-.051	.278
Ethnicity	n/a	n/a	n/a	n/a	n/a	n/a
Age	1.060**	.058	.019	.003	.021	.095

*p < .05

**p < .01

***p < .001

Table 4

Indirect effects on vulnerability to disease in the E.U. Referendum

	B	*SE*	*p*	CI 95%	
LHS/POLS	.080	.074	.276	-.065	.225
TER	.123	.075	.101	-.024	.27
CSES	.087	.082	.288	-.074	.248
CRI	.411	.081	< .001	.252	.57
IMP	.140	.076	.065	-.009	.289
SOC	-.234	.076	.002	-.383	-.085
SOS	-.028	.084	.737	-.193	.137
Education	.088	.077	.254	-.063	.239
Gender	.023	.067	.729	-.108	.154
Age	-.030	.075	.689	-.177	.117

*p < .05

**p < .01

***p < .001

Table 5

Direct effects on voting Brexit after accounting for indirect effects

	B	SE	p	CI 95%	
DIS	.216	.093	.021	.034	.398
Education	-.380	.097	<.001	-.57	-.19
Gender	.051	.124	.677	-.192	.294
Age	.333	3.072	.002	-5.688	6.354

*p < .05

**p < .01

***p < .001

U.S. Presidential Election

A multinomial logistic regression was run in Mplus (version 8), with $N = 289$ and estimator MLR. The voting choices of Trump compared to Clinton, and neither compared to Clinton were regressed on the life history model (LHS/POLS, TER, DIS, CSES, CRI, IMP, SOC, SOS) with demographic variables controlled for (age, sex, education, ethnicity, deprivation). Model fit was assessed using McFadden's (1974) R^2 index. This resulted in an R^2 index of .28 which can be interpreted as a very good fit of the data (values between .2 and .4 are considered excellent fit, Louviere, Hensher, and Swait, 2000). The predictive ability of the model was evaluated by counting instances of correct classification, using a subset of data not employed in model specification. The model allocated individuals (from the sub-sample) to the correct class 63% of the time. The ROC curve of true-positive rate against false positive rate was estimated for multi-class logistic models (see Hand & Till, 2001) and resulted in an AUC of .71, suggesting good predictive ability of the model.

As per P3, people who perceive a high threat from terror were significantly more likely to vote Trump compared to Clinton. In addition and contrary to P2, people with a slower life-history strategy/pace of life syndrome were significantly more likely to vote Trump compared to Clinton, as well as people being less likely to vote neither compared to Clinton. The demographic variables deprivation, and age (older) made it more likely to vote neither compared to Clinton. Non-white ethnicity increased the likelihood of voting neither compared to Clinton. An increase in the education level decreased the likelihood of voting neither compared to Clinton. Table 6 reports all ORs and standardised beta results for the model.

In line with the posterior-formed hypothesis in the EU Referendum results, an indirect effect path analysis was carried out in which the life history variables predict LHS/POLS and TER, which then predict vote

choice, with demographic variables controlled for (Table 7). DIS, CSES, CRI and SOC significantly predicted LHS/POLS such that individuals who perceive themselves as being more vulnerable to disease, whose childhood socio-economic standing was higher, are more fearful of crime and have a greater sense of control reported a slower life-history strategy. Sex and ethnicity also predicted LHS/POLS demonstrating that women had a slower life-history strategy, and non-white individuals had a faster life-history strategy/pace of life syndrome. However, after accounting for indirect effects LHS/POLS no longer explained a significant amount of variance in voting Trump compared to Clinton (Table 8).

DIS, CRI and SOC significantly predicted TER such that individuals who perceive themselves to be at greater risk of disease, who are more fearful of crime and have a greater sense of control consider terrorism to be a greater threat. Similarly, people who are older, white, and less deprived also report increased threat of terrorism. Including the indirect effects, TER remained significant in predicting voting Trump compared to Clinton. A fast life-history strategy/pace of life syndrome remained a significant predictor of voting for neither candidate versus Clinton, as did being non-white and living in a more deprived area (see again Table 8). Thus, P4 is not supported.

Table 6

Odds ratios and standardised regression coefficients from multinomial regression

	Trump compared to Clinton						Neither candidate compared to Clinton					
	OR	B	SE	p	CI 95%		OR	B	SE	p	CI 95%	
LHS/POLS	1.018**	.378	.188	.004	.010	.746	0.976*	-.503	.230	.022	-.954	-.052
TER	1.076**	.632	.193	.001	.253	1.010	0.986	-.118	.220	.608	-.549	.313
DIS	0.990	.125	.183	.495	-.234	.483	0.987	-.153	.225	.496	-.594	.288
CSES	1.002	.020	.174	.908	-.321	.361	1.041	.341	.216	.115	-.082	.764
CRI	1.034	.279	.211	.186	-.135	.693	1.050	.400	.243	.101	-.076	.876
IMP	1.010	.129	.199	.517	-.261	.519	1.003	.038	.267	.886	-.485	.561
SOC	0.963	-.180	.201	.370	-.574	.213	0.972	-.135	.242	.578	-.609	.339
SOS	0.991	-.134	.192	.486	-.510	.242	0.980	-.304	.259	.241	-.812	.204
Deprivation	1.010	.103	.176	.557	-.242	.448	1.040*	.408	.168	.015	.079	.737
Education	0.846	-.173	.180	.337	-.526	.180	0.702*	-.359	.175	.040	-.702	-.016
Gender	0.914	-.047	.190	.803	-.419	.325	0.703	-.182	.222	.413	-.617	.253
Ethnicity	0.409	-.368	.188	.050	-.736	.368	2.602*	.385	.178	.031	.036	.734
Age	1.008	.112	.182	.538	-.245	.469	1.030*	.425	.210	.043	.013	.837

*$p < .05$

**$p < .01$

***$p < .001$

Table 7

Indirect effects on life-history strategy and terrorism in the U.S. presidential election

	LHS/POLS					TER				
	B	*SE*	*p*	95% CI		*B*	*SE*	*p*	95% CI	
CRI	.152**	.058	.009	.038	.266	.480***	.056	< .001	.370	.590
DIS	.167**	.057	.003	.055	.279	.147*	.060	.014	.030	.265
CSES	.108*	.108	.049	-.104	.320	.081	.081	.179	-.078	.240
IMP	.063	.061	.306	-.057	.183	-.094	.068	.165	-.227	.039
SOC	.418***	.050	< .001	.320	.516	.139*	.067	.039	.008	.270
SOS	-.086	.060	.152	-.204	.032	-.032	.066	.625	-.161	.097
Deprivation	.015	.053	.784	-.089	.119	-.102*	.042	.016	-.184	-.0120
Education	.053	.052	.307	-.049	.155	-.093	.054	.085	-.110	.0128
Gender	-.152**	.058	.009	-.266	-.038	-.100	-1.797	.072	3.422	-3.622
Ethnicity	.104*	.048	.031	.010	.198	-.134*	-2.254	.024	4.283	-4.552
Age	.077	.061	.205	-.043	.197	.179**	3.061	.002	-5.821	6.179

*p < .05

**p < .01

***p < .001

Table 8

Direct effects after accounting for indirect effects in the U.S. presidential election

	Trump compared to Clinton						Clinton compared to neither candidate					
	OR	B	SE	p	CI 95%		OR	B	SE	p	CI 95%	
LHS/POLS	1.015	.341	0.150	.082	.047	.635	0.976**	-.581	0.228	.005	-1.028	-.134
TER	1.085*	.787	0.196	<.001	.403	1.171	1.002	.015	0.206	.947	-.389	.419
Deprivation	1.010	.115	0.195	.555	-.267	.497	1.039*	.468	0.183	.010	.109	.827
Education	0.854	-.183	0.194	.344	-.563	.197	0.742	-.355	0.188	.060	-.723	.013
Gender	0.928	-.044	0.184	.812	-.405	.317	0.848	-.099	0.232	.668	-.554	.356
Ethnicity	0.487	-.331	0.208	.111	-.739	.077	3.294**	.563	0.165	.001	.240	.886
Age	1.002	.035	0.184	.849	-.326	.396	1.025	.418	0.225	.640	-.023	.859

*p < .05

**p < .01

***p < .001

Discussion

Previous research has investigated the motivations, demographic profiles and personality traits of individuals who, in the U.K. voted Brexit., and in the U.S., voted for Donald Trump. However, to the authors' knowledge, this is the first study that has framed voting behaviour within an evolutionary, LHT and POLS perspective. We wanted to investigate whether in the lead up to the E.U. Referendum and U.S. Presidential Election, people had perceived themselves to be at greater existential threat which consequently prompted a shift to a present-orientated LHS/POLS and a vote for Brexit or Trump as the most immediate and accessible solutions to the problem of terrorism and immigration. As predicted, people reported an increase in perceived existential threat between 2014 and 2016 in comparison with the time period before, thereby indicating a shift in environmental conditions to those considered more uncertain and hazardous. Furthermore, this increase was significantly more for people who voted Brexit or for Trump compared to those that did not. In the second study, as in line with earlier research (Abrams & Travaglino, 2018; Swami et al., 2018; Van de Vyver et al., 2018), Brexit voters were older, less educated, felt more vulnerable to crime and less in control of their life, resulting in feeling more vulnerable to disease, and therefore by proxy, immigration. However, LHS/POLS did not predict voting for Brexit. In contrast, voting in the U.S. presidential election was subject to other factors. Again, as per previous research (Huang et al., 2016), feeling under more threat from terrorism, but also a slower LHS/POLS initially predicted voting for Trump compared to Clinton, however after controlling for indirect effects only fear of terrorism remained the significant predictor in voting for Trump. Fear of crime and disease (immigration), as well as a greater sense of control over one's life in turn predicted fear of terrorism.

It is interesting that immigration posed a bigger threat to Brexit voters than terrorism. Brexit voters tend to be from more deprived areas (Arnorsson & Zoega, 2016; Mason, 2016; Goodwin & Heath, 2016) and are more vulnerable to the negative economic outcomes of immigration because their educational achievement might only be sufficient for low-skilled occupations that immigrants also have access to (Fernández-Reino & Rienzo, 2020), which would be expected to feed into feelings of low sense of control. Effectively, they have few alternatives to pursue when immigrants move to their area and are perceived to take jobs that the local population consider that they should be entitled to. This might explain the reason that LHS/POLS did not predict voting for Brexit, such that Brexit voters had already been subject to socio-economic decline to the extent that a threshold of adverse circumstances had already been reached, and no further signalling from the environment would prompt change in LHS/POLS. Brexit voting areas had already experienced Eastern

European immigration and may have acclimatised to this effect. Individuals from these areas may also perceive themselves to be at less risk, if any, from terrorism in view of the fact that attacks occurred almost exclusively in London (albeit not forgetting the Manchester Arena suicide bombing attack) and the economic challenges they face are more pressing and experienced on a daily basis. Indeed, Brexit voters felt more at risk from crime and less in control of their life.

The Brexit voter profile as evidenced in the current study partly dovetails with those who voted for neither Trump nor Clinton in the U.S. Presidential Election. These individuals also came from more deprived areas, were less educated, less likely to be white and were older. Furthermore, these individuals also reported a fast LHS/POLS, that was in turn predicted by fear of disease (immigration) but not terrorism. Thus, it is possible that ongoing concerns about immigration and its economic impact did cause a shift to a faster LHS/POLS, but to the extent that voting in the presidential election was rejected because increased focus was given to addressing daily concerns such as food and security that neither Clinton nor Trump could offer immediate and effective solutions for. Essentially, the presidential election campaigns did not have direct relevance for these individuals. Indeed, terrorism was not considered a threat potentially due to the much greater likelihood of being a victim of localised crime compared to being a victim of terrorism. Threats from IS would probably be considered highly marginal to people from deprived backgrounds. Alternatively, individuals who voted for neither candidate may have pursued a fast LHS/POLS in the first instance.

In contrast, Trump voters were more fearful of terrorism, as part of a wider constellation of other existential threats from crime and disease, but this did not relate to feeling less in control of their life, nor a faster LHS/POLS. Potentially, an individual must perceive some civic empowerment in exercising their right to vote, and in believing that their vote matters. Overall, Trump voters could feel more in control of, and be aware of the ability to change their circumstances, which partly addresses why ultimately, LHS/POLS did not predict voting for Trump. Existential threat and uncertainty may have increased, but Trump voters, compared to those that voted for neither candidate, felt that they *could* take action. Furthermore, by voting for Trump, they were voting for someone who *would* and could be trusted to take action on their behalf (i.e., "Make America Great Again"). Indeed, Trump voters considered Trump as a trustworthy figure (Huang et al., 2016). Thus, even though fast LHS/POLS factors such as level of education and economic dissatisfaction were characteristic of Trump voters (Schaffner, MacWilliams, & Nteta, 2017), they were not as pronounced as in those who did not vote for neither candidate, and were counterbalanced by feeling greater control over personal circumstances.

It was interesting to note that expected proxies of LHS/POLS (e.g., sex, high childhood socio-economic standing, ethnicity, fear of crime and disease) predicted LHS/POLS, although for the American sample only. The K-SF-42 is a relatively new measure (Figueredo et al., 2017), and was originally tested in a ranges of countries, although not the U.K. Subsequent studies that have used the K-SF-42 have not included U.K. populations. Furthermore, its predecessor, the Arizona Life History Battery (Figueredo, Vásquez, Brumbach, & Schneider, 2004) has had limited application in the U.K. It is possible that religiosity and community-orientated behaviours may function to a less of a degree in the U.K. considering declining rates of religion (Office for National Statistics, 2013) and how this detrimentally impacts on opportunities for community engagement that otherwise would have been facilitated through church activities. Furthermore, it is possible that there is a currently unknown factor that taps into LHS/POLS in U.K. samples. This presents an interesting avenue for future research.

There are several limitations to the study. Firstly, a longitudinal design would have been advantageous in observing directly whether there was an actual shift in LHS/POLS before and after 2014. It may be the case that a time period must elapse before a shift in LHS/POLS can be detected in a psychometric measure. Furthermore, focusing on direct proxies of behaviours associated with LHS/POLS rather than LHS/POLS directly could provide insight. For example, those associated with resource acquisition and storage (i.e., purchasing and storing more food), measures taken to protect oneself from terrorism and related threats (e.g., avoiding cities and public transport, suspicion of ethnic minorities etc.), and crucially, family planning (both actual and desired). Considering that the U.K. has only recently left the E.U., a comparison between this time and time after Brexit would be helpful to observe whether that would also prompt a shift in LHS/POLS.

A truly representative sample (i.e., rather than opportunity) would be preferential. Indeed, whilst a notable number of Brexiteers fit the demographic profiles as discussed previously in this paper, those of the "baby boomer" generation who were over 65 and Conservative voters also voted Brexit and were differentially motivated in their voting behaviour (e.g., nostalgia for times previous to joining the European Commission in 1972) (Barber, 2018). Similarly, it would be interesting to explore why individuals with slower LHS/POLS voted Trump. It could be that they were are more sensitive to threats from the environment, or that they consider a vote for Trump as a long-term option.

Evidently, people's voting behaviour is complex and varied, therefore without deeper analysis, only broad explanations can be offered at this point. However, the current study has provided an alternative framework of evolutionary theory to explain voting behaviour in this current age of politics.

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