

Personality Traits and Social Structure

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Abstract

This chapter draws together and reviews existing evidence on the relationship between personality traits and social structure. It is argued that broad influences in the social environment play an important, yet often neglected, role in shaping patterns of thoughts, feelings, and behavior across life. For example, recent research has utilized representative samples to demonstrate that commonly experienced life events including adopting adult roles may induce personality change, as conceptualized within the Big Five hierarchical framework. Conversely, early-emerging differences in personality have been shown to forecast subsequent social outcomes and contribute to socially patterned differences between individuals. To provide an ordered approach to understanding the current state of knowledge on the relationship between personality and social change the chapter is structured as follows: First, it overviews the nature of the Big Five trait dimensions and how personality may change, particularly in response to “the settings and conditions of our lives” as gauged by social indicators (e.g. employment and marital status, parenthood, income, and education) (MacLachlan, 2014). Then it switches focus to findings elucidating how personality shapes social circumstances. Finally, drawing on socioecological and geographical psychology it examines the macro-level relationship between personality and social structure and the implications of this relationship for informing intervention and policy design. Key methodological challenges and limitations of existing studies are elucidated throughout and future directions highlighted.

Key words: personality; social structure, socioeconomic status, social outcomes, geographical psychology

Personality traits are potentially malleable predictors of lifelong social outcomes and for this reason warrant consideration in policy planning. For instance, the Sustainable Development Goals propose that countries seek to accomplish major societal advances in the areas of economic development and social inclusion. These include achieving high quality education and adequate income, decent work for all, economic success, and good health and well-being (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). Achieving these ambitious policy goals requires a “leave no one behind” approach (Watkins, 2014) and personality and individual differences research can assist in identifying those at particularly high risk of adverse outcomes (Caspi et al., 2016; Moffitt et al., 2011). Further, understanding the traits most closely related to life outcomes can also inform interventions that: (i) directly target the development of personality traits (Pandey et al., 2018; Roberts et al., 2018), (ii) are tailored to specific personality traits (Chapman, Hampson, & Clarkin, 2014), or (iii) aim to modify contexts within which personality is expressed.

It is also important for discussions of social change at the macro-level to consider how personality traits become represented as aggregate-level psychological and behavioral tendencies. For instance, where psychological traits are common in regions (e.g. openness to experience – associated with imagination and artistic interests) the collective behavior that follows (e.g. attendance at artistic and cultural events) may inform the formation or expansion of social institutions (e.g. universities, cultural spaces) (Rentfrow, Gosling, & Potter, 2008). These institutions, in turn, may have “top-down” effects on the spatial distribution of personality traits by attracting (or repelling) individuals with different personality traits (e.g. more open individuals attracted to areas with greater access to cultural experiences). Further, extensive evidence indicates that personality traits are changeable (e.g. Roberts, Walton, & Viechtbauer, 2006) and macro-level influences including the spatial clustering of social institutions and the behavioral tendencies of large concentrations of

people may shape the enduring cognitions, emotions, and actions of individuals. Whilst research examining potential macro => micro personality effects has been rare, a rapidly growing empirical literature has generated prospective evidence detailing the role of social circumstances in inducing personality change. This work will be overviewed in this chapter and organized in terms of the widely accepted hierarchical Big Five framework, which warrants introduction before turning to the relationship between personality and social structure.

Personality traits and the five-factor model

Whilst a wide array of accounts of personality were proposed over the 20th century, contemporary personality psychologists and those integrating personality research into other disciplines have adopted an account of personality where traits are the defining feature (Borghans, Duckworth, Heckman, Ter Weel, 2008; Costa, McCrae, & Löckenhoff, 2019). Personality traits are characteristic patterns of thoughts, feelings, and behavior that distinguish individuals from one another (Roberts & Mroczek, 2008). Traits are relatively consistent across situations and contexts, reflecting the enduring and often automatic ways in which people respond to environmental cues. Although there is a myriad of ways in which individuals may differ from one another, an accumulation of evidence indicates that five broad dimensions can capture how people tend to vary on specific traits. Individual differences are frequently viewed through the lens of the hierarchically structured Big Five or five factor taxonomy. Within this widely used personality hierarchy, the traits conscientiousness (e.g. the tendency to be organized, responsible, and hardworking), extraversion (e.g. outgoing, sociable, energetic), neuroticism (e.g. characterized by proneness to worry, pessimism and emotional instability), openness (e.g. tendency to be open to imaginative, cultural, intellectual experiences), and agreeableness (e.g. co-operative, compassionate, and trusting), occupy the highest level (Digman, 1990; Goldberg, 1993;

McCrae & Costa, 1987). This small set of very broad dimensions (e.g. agreeableness) captures meaningful overlap in subordinate narrow, specific traits (e.g. altruism, trust, modesty, cooperation, sympathy) that are composed of more specific responses (e.g. giving money to charity, donating blood).

Evidence for the five factor structure emerged from lexical research where individual differences were hypothesized to have become “encoded” into everyday language terms that individuals use to describe their own and others’ personalities (Goldberg, 1993). Thousands of personality-descriptive adjectives across the world’s languages can be conceptualized in terms of the five-factor model. Factor analysis has also shown that other personality inventories (e.g. the Eysenck Personality Inventory, the Myers-Briggs Type Indicator, the Minnesota Multiphasic Personality Inventory) can be organized in terms of the Big Five (Digman, 1990). In terms of measurement, traits are conceptualized as dimensions where individuals can score from very low to very high. Personality is measured in most studies using easily administered, reliable self-report questionnaires where individuals rate the accuracy of trait descriptors designed to capture their position on a given personality trait dimension. Factor analysis of such self- or peer- ratings of personality-descriptive terms indicates that the five-factor model provides an adequate account of structural variation in human personality in studies conducted across several decades and a broad set of nations and languages (Fiske, 1949; McCrae & Costa, 1987; McCrae & Terracciano, 2005).

Beyond concerns about taxonomy and personality structure, two fundamental questions of key relevance to this chapter remain: what are the causes of personality variation and how do individual differences influence important life outcomes? There is growing evidence that, rather than being static, personality traits may change in response to environmental circumstances. As such, traits may represent promising malleable characteristics that are influenced by social structures and can be enhanced through

intervention programs, potentially generating important societal benefits (Bleidorn et al., 2019). A key initial aim of this chapter is therefore to: (i) overview research on the role of social circumstances in shaping personality levels, and (ii) examine the prospective relationship between personality traits and life outcomes that may contribute to social stratification and social institutions (e.g. educational attainment, income, employment and marital status).

Social factors as causes of personality traits

Environmental influences have long been recognized in psychology as determinants of how people tend to think, feel, and behave. However, the study of the environment has focused primarily on proximal social or physical influences and how such factors are perceived or represented by individuals. Understanding how the immediate context impacts emotion, cognition, and behavior has shed crucial light on psychological processes and their physiological correlates. Yet, to date, the potentially crucial role of broader life circumstances, social settings, and the macroenvironment has been largely neglected (Oishi, 2014).

This point applies within personality psychology where research has focused on important foundation issues such as how individual differences should be conceptualized and classified and whether a universal system for construing and measuring stable differences between people can be established. More recently, extensive research has sought to uncover the cause of variation in personality chiefly by examining the biological foundations of personality traits. Twin and genome wide association studies have linked genetic and personality variation (Okbay et al., 2016) and identified specific genetic loci associated with personality traits (Luciano et al., 2018). Estimates from this work suggest that approximately half of the variation in the Big Five personality traits can be accounted for by genetic factors

(Vukasovic & Bratko, 2015). Efforts to elucidate the heritable component of personality traits suggest that this reflects the contribution of thousands of genetic variants each accounting for a minuscule portion of personality differences (Chabris et al., 2015; Okbay et al., 2016). Others have drawn on neuroimaging techniques to correlate personality traits with brain structure and the functioning of relevant brain systems (DeYoung et al., 2010). Capitalizing on technological innovations and large-scale surveys to examine the heritability and neurobiological correlates of human traits represents an important advancement in personality research. However, this approach is limited in its scope perhaps because personality traits have been conceptualized as “basic tendencies” that follow intrinsic development paths rooted in unchanging biological systems (McCrae & Costa, 2008).

From this traditional ontogenetic perspective personality traits have been considered to be relatively fixed (“set like plaster”) in early adulthood following a period of maturation influenced primarily by genetic factors (McCrae & Costa, 1994). Indeed, substantial stability in personality traits has been documented across adulthood (Cobb-Clark & Schurer, 2012; Costa et al., 2019). Further, evidence that family socioeconomic status may meaningfully impact the emergence of differences in the Big Five personality traits has been mixed (e.g. Ayoub, Gosling, Potter, Shanahan, & Roberts, 2018; Strickhouser & Sutin, 2019). Yet, it is clear that personality traits show important patterns of change, particularly when examined over the long-term (e.g. Damian, Spengler, Sutu, & Roberts, 2019).

An extensive literature has now documented personality change throughout life, as gauged by mean-level changes or how average trait levels of those of the same age change over time. For instance, meta-analytic research suggests that as people age they generally become more agreeable, conscientious, and emotionally stable (Roberts et al., 2006). These changes are in line with the maturity principle, whereby personality increases in an adaptive manner as people age and become more capable of performing tasks associated with adult-

role responsibilities and successfully negotiating social relationships (Roberts, Caspi, & Moffitt, 2001). Individuals of similar age also tend to change in their relative ordering on trait dimensions across fixed-term longitudinal assessments. Rank-order stability in personality traits is greater in mid-life than in young adulthood, which may partly reflect the presence of a stabilizing environment because work, family, and other social roles are typically established at this point (Briley & Tucker-Drob, 2014; Roberts & DelVecchio, 2000).

Importantly, the magnitude of personality change has been found to be meaningful, and equivalent or greater to fluctuations in “variable” socioeconomic factors such as income or unemployment (Boyce, Wood, & Powdthavee, 2013). Further, personality stability and change can be attributed not only to biological maturation processes, but also to environmental influences which have been found to shape personality development across life (Briley & Tucker-Drob, 2014; Kandler, 2012). Personality development researchers have therefore sought to develop theoretical approaches that incorporate the impact of contextual influences and socialization on the Big Five. In particular, the Neo-Socioanalytic Model (Roberts & Nickel, 2017; Roberts & Wood, 2006) moves beyond the assumption that personality is unaffected by experience. A primary prediction of the model, based on the social investment principle, is that the expectations and demands of age-graded social roles may be a central mechanism driving personality change. This is proposed to be a normative process evident across societies where people “commit themselves to the adult roles found in the social structures of family, work, and community” (Roberts & Nickel, 2017).

Shifts in social roles such as becoming an employee, investing in a romantic relationship, and starting a family may invoke personality change and underpin normative patterns of personality maturity. This idea is in line with bottom-up perspectives on personality development suggesting that prolonged changes in life circumstances may alter how people think, feel, and behave. When aggregated, such changes in personality states may

lead to mean-level changes in personality traits (Fleeson, 2004). But what are the operative social factors that make personality susceptible to change? Research on this topic has focused primarily on the role of educational, occupational, and relationship-related life events.

For instance, graduating from high school is one of the first major role transitions that adolescents experience and has been shown to forecast increases in conscientiousness, agreeableness, and openness, and decreases in neuroticism (Bleidorn, 2012; Ludtke, Roberts, Trautwein, & Nagy, 2011). Similarly, choosing a vocational rather than academic educational path predicts increases in conscientiousness (Golle et al., 2019), suggesting that the demands associated with early entry into work may induce personality maturation. Studies within economics suggest that education may have a positive impact on extraversion, a trait associated with an outgoing and energetic approach to life (Schurer, 2017). However, this research yielded mixed and inconsistent findings in relation to education-induced change in other personality traits. Retirement represents a major life event that may have an enduring effect on people's patterns of thoughts, feelings, and behavior. This transition is characterized by the removal of well-defined career expectations and goal pursuits and the onset of a more affiliative role and more harmonious social relationships given the increased opportunity to spend time with family and friends. Perhaps for these reasons, retirement has been linked to increases in agreeableness – after leaving work participants were less argumentative and competitive, traits that may be less advantageous outside of work settings (Löckenhoff, Terracciano, & Costa, 2009; Schwaba & Bleidorn, 2019).

In the relationship domain, entering a stable romantic relationship has been linked to positive personality changes including reduced levels of neuroticism and raised levels of extraversion and conscientiousness (Lehnart, Neyer, & Eccles, 2010; Neyer & Asendorpf, 2001; Wagner, Becker, Lüdtkke, & Trautwein, 2015). In contrast, divorce has not been found to demonstrate a consistent impact on personality trait change (Bleidorn, Hopwood, & Lucas,

2018). Similarly, the transition to becoming a parent has not been found to induce a clear pattern of personality change (Specht, Egloff, & Schmukle, 2011; van Scheppingen et al., 2016). This finding is at odds with the social investment principle, and may suggest that it is the successful mastery of social roles that is crucial for personality change than simply acquiring a new role (Roberts & Nickel, 2017). Overall, whilst relatively little research has examined the impact of normative life events on personality, research to-date suggests that such events may bring about change in personality traits (Bleidorn et al., 2018).

Many existing studies investigating the effects of normative events on personality have important methodological strengths including drawing on national samples, utilizing longitudinal designs, accounting for measurement error in the assessment of personality, and taking steps to overcome selection effects such as accounting for the role of pre-event personality traits and a wide range of covariates that may influence life events (Bleidorn et al., 2018; Specht et al., 2011). However, establishing the impact of normative life events (e.g. graduating from school, entering the workforce, getting married) is difficult because personality may change in anticipation of each of these events. Normative events also occur at relatively similar points in the life cycle for most people, making it difficult to attribute personality change to the event rather than maturation that would have occurred in their absence. For these reasons, researchers have sought to examine non-normative events associated with marked unexpected changes in life circumstances than may render personality change.

For instance, exposure to adverse life events (e.g. death of a loved one, life-threatening illness) has been shown to produce shifts in personality traits, increasing neuroticism and decreasing aspects of agreeableness and openness (Löckenhoff, Terracciano, Patriciu, Eaton, & Costa, 2009). Unemployment is an extreme and undesirable acute change in life circumstances that is experienced by a substantial portion of people at some stage in

their working lives. Job loss removes time structure, severs social contact and support, and reduces opportunities to express personality traits relevant to the work context. In a recent longitudinal study, unemployment was associated with adverse changes in agreeableness, conscientiousness, and openness, with its influence depending on the number of years the person was unemployed (Boyce, Wood, Daly, & Sedikides, 2015). In particular, conscientiousness appeared to decline in the medium term following unemployment, perhaps due to the removal of job-related situational pressures to display competence, follow rules, avoid mistakes, and behave in a generally conscientious manner. However, more recent studies examining this topic have yielded conflicting or null findings (Anger, Camehl, & Peter, 2017; Denissen, Luhmann, Chung, & Bleidorn, 2019; Gnambs & Stiglbauer, 2019), suggesting that the relationship between unemployment and personality change may be complex and potentially contingent on factors such as the duration of the job loss experienced and the characteristics of those experiencing unemployment.

Research on this topic highlights the challenges involved in attempting to identify the role of social factors in shaping personality traits. Leading commentators have suggested that the complex and potentially transient nature of such measurable environmental influences make them particularly difficult to “pin down” through scientific inquiry (Costa & McCrae, 2008; Turkheimer, 2000). For instance, by relying on non-experimental data, the studies discussed here cannot rule out: (i) that the psychological impact of life events may come through anticipation of those events (e.g. becoming less emotionally stable before losing one’s jobs, becoming more conscientious before having a baby), (ii) that pre-event personality changes may lead to the event of interest (e.g. becoming unemployed because of a decline in conscientiousness), and (iii) that personality changes may reflect the influence of other changes in life circumstances occurring in parallel with the event of interest (e.g. becoming unemployed because of a recession that may have wide-ranging societal and

personality effects). As such, evidence for the extent and form of personality change following life events has been described as being at a preliminary stage, with stringently controlled research drawing on multiple assessment methods and waves now needed (Bleidorn et al., 2018).

In contrast, the stability evident in personality assessments, as anchored within the five factor model, has already made the examination of traits as “inputs” to life choices and social factors a rich area of investigation (Cobb-Clark & Schurer, 2012; Costa et al., 2019). In particular, the recent rapid increase in the availability of measures of personality and individual differences in large surveys has enabled researchers from a wide range of disciplines to uncover the predictive power of personality across major life domains.

Social factors as consequences of personality traits

Research from within psychology, economics, sociology, and epidemiology has established that personality differences reliably forecast consequential social outcomes that may shape social stratification, social institutions, and social structure. These include educational attainment, employment status, residential and social mobility, relationship success, childbirth, risky behaviors and violence (Borghans et al., 2008; Krueger, Caspi, & Moffitt, 2000; Roberts et al., 2007). Further, the long reach of personality traits has been found to be independent of intelligence, a well-recognized determinant of consequential life outcomes. It is necessary to separate the potential contributions of intelligence and personality because both display empirical overlap (e.g. intelligence correlates positively with openness to experience and negatively with neuroticism) and are thought to be closely related to life success, particularly in education and work (Ackerman & Heggestad, 1997). As such, prior to addressing the role of personality in forecasting life outcomes it is important to highlight the nature of human intelligence and its potential role in shaping life outcomes.

To summarize, general intelligence (g) describes the common or shared variance between broad domains of cognitive functioning (e.g. working memory, processing speed, reasoning), which in turn capture overlap in specific cognitive subtests. This implies that those who perform well on an individual cognitive test tend to do well on others, a key finding that has been replicated across hundreds of datasets (Carroll, 2003). Psychometric tests assessing cognitive ability were first developed to predict educational outcomes, and large-scale estimates indicate that they do this extremely well. Intelligence has been shown to explain over 30% of the variance in educational achievement (Strenze, 2007), with this estimate rising to over 60% when overlap in latent general intelligence and a latent educational achievement factors is examined (Deary, Strand, Smith, & Fernandes, 2007).

Educational attainment generates substantial financial returns (Card, 1999) and may partly explain why high-IQ children access prestigious occupations, avoid unemployment, and rise up within company ranks (Daly, Egan, & O'Reilly, 2015; Strenze, 2007). Evidence on this topic suggests that those with higher levels of general intelligence will tend to possess a range of cognitive strengths including strong reasoning skills, the ability to process large amounts of information quickly and to retain and manipulate that information in working memory. In contemporary meritocratic societies, abilities such as these may foster examination performance and facilitate access to competitive universities and cognitively demanding high paying professions (Egan, Daly, & Delaney, 2017). In contrast, low cognitive ability is associated with a range of unfavorable outcomes that generate costs to society including increased antisocial and risky behavior, greater prejudice, and an elevated likelihood of engagement in criminality (Dhont & Hodson, 2014; Schwartz et al., 2015).

Yet, intelligence represents just one domain of human talent that is associated with meaningful life outcomes. For example, a recent study examining a high-IQ U.S. sample, showed that high levels of conscientiousness and extraversion in early adolescence were

associated with notable increases in lifetime earnings (Gensowski, 2018). These increases were independent of variation in intelligence levels within the sample and were most pronounced among men with a graduate degree and during the “prime working years” of age 40-60. Thus, even for those with exceptional intelligence (the top 0.5% of the IQ distribution), educational and labor market benefits may arise from personality traits. These findings are in line with the observation of Heckman and Rubinstein (2001) who noted that “numerous instances can be cited of people with high IQs who fail to achieve success in life because they lacked self-discipline and of people with low IQs who succeeded by virtue of persistence, reliability and self-discipline” (p. 145).

Indeed, there is particularly robust evidence documenting the long-term societal benefits associated with conscientiousness, as observed in the general population (Almlund, Duckworth, Heckman, & Kautz, 2011). This is perhaps unsurprising considering conscientious individuals tend to be disciplined and well organized, to strive for excellence, and persevere when confronted with difficulties. Conscientiousness forecasts increased academic achievement (Poropat, 2009), productivity (Cubel, Nuevo-Chiquero, Sanchez-Pages, & Vidal-Fernandez, 2016) and earnings, less cumulative unemployment across working life and better health (Egan, Daly, Delaney, Boyce, & Wood, 2017). In contrast, low conscientiousness has been consistently associated with divorce, substance abuse and antisocial and criminal behavior (Ozer & Benet-Martinez, 2006; Roberts et al., 2007).

Major reviews of the personality-outcome literature (e.g. Almlund et al., 2011; Ozer & Benet-Martinez, 2006; Roberts et al., 2007) have provided evidence linking all Big Five traits to family relations and social institutional outcomes including marital outcomes, occupational choice, socioeconomic status, and financial security. For example, across existing review articles, neuroticism has been related to relationship conflict, divorce, and reduced occupational commitment and extrinsic success. Extraversion has been highlighted

as a dispositional source of relationship success, job performance and shown to predict social and enterprising occupational interests, and increased income, leadership capacity, and wealth accumulation (Judge, Bono, Ilies, Gerhardt, 2002; Mosca & McCrory, 2016; Sutin, Costa, Miech, & Eaton, 2009). Agreeableness tends to predict greater marital stability and relationship satisfaction and reduced criminal behavior, but also reduced income, particularly among the less affluent (Matz & Gladstone, 2018). Finally, research has linked openness to experience with academic performance, entrepreneurial status, and political liberalism (Poropat, 2009; Zhao & Seibert, 2006).

Taken together, the magnitude of these associations has led reviewers of the personality-outcome literature to conclude that the predictive validity of personality traits for marital, educational, and occupational outcomes could not be distinguished from the impact of socio-economic status and intelligence on the same outcomes (Roberts et al., 2007). These linkages are evident when evidence from prospective longitudinal studies is examined and also appear to be highly replicable. A recent high-powered (N = 1504) pre-registered study showed that 87% of previously identified linkages between personality traits and life outcomes (drawn from Ozer & Benet-Martinez, 2006) could be replicated with effects similar in magnitude (77% as strong) to those identified in the original studies (Soto, 2019).

Despite these apparently robust findings, research within personality psychology has tended to focus on implications for individuals, and integrative accounts that consider personality-outcome associations at the macro-level have been rare. Further, the possibility that the prospective association between personality traits and social outcomes may be modified by the social contexts that people are born into and develop through has been largely neglected. We now turn to these questions and theoretical accounts of the bidirectional “co-construction” of personality and social circumstances.

Macro perspectives on personality and social structure

The study of the relationship between macro-social conditions and personality stretches back several decades in the social science literature (see Ryff, 1987, for a detailed overview).

Historically, the idea that the sociocultural environment may be internalized through socialization to influence personality was explored through the lens of psychodynamic theory (Parsons, 1958). Subsequently, House (1977) proposed the study of social structure and personality as a core area of social psychology that would draw on survey data to produce quantitative estimates of how major societal phenomena relate to individual personality characteristics. In defining this field of research, House (1981) proposed a focus on investigating the “relation of macro-social structures (for example, societies, organizations, communities, social classes, racial or ethnic groups, and so forth) or processes (industrialization, urbanization, social mobility) to individual psychological attributes and behavior”. House (1981) suggested that psychologists broaden their remit of investigation to: (i) draw more heavily on conceptualizations of macro-level structures and social systems developed by sociologists, (ii) identify how interpersonal interactions in work, family, and community contexts, connect individuals to social structures, and (iii) understand “when, how, and to what extent macro-social phenomena” have effects on individuals’ characteristic patterns of cognitions, affect, and activity (House, 1981; McLeod, Hallett, & Lively, 2015).

However, in the intervening period, attention to the connection between the macro-social environment and psychological processes has been limited. This is despite calls for greater integration from researchers within psychology and sociology (e.g. Ryff, 1987; Schnittker & McLeod, 2005). Perhaps an exception has been the influence of ecological accounts of human development (Bronfenbrenner, 1977), which helped widen the scope of investigation within developmental and educational psychology. In these areas, it became increasingly common to move beyond the immediate situation to consider broader

sociocultural influences such as how family structure, and school and neighborhood environments shape cognitive and emotional development, aspirations and status attainment (Ryff, 1987; Sewell & Hauser, 1980).

Only in recent years has personality psychology seen a resurgence of interest in the macro-social environment and theoretical development and empirical research linking individuals and social structures. Oishi and Graham (2010) draw on previous ecological accounts including Bronfenbrenner's to outline a "socioecological" approach to psychological research that incorporates physical, societal, and interpersonal environments. The authors advocate for a renewed interest in sociocultural influences and a reawakening of the "sociological imagination" among psychologists. They propose that mainstream empirical research can uncover the psychosocial channels that translate the impact of distal social contexts and objective environments on individuals' emotions, cognitions, and actions. Specifically, Oishi (2014, p. 599) argues for a shift from a subjectivist to an objectivist approach where the impact of "objective physical environments (e.g., green space, climate, pathogen prevalence), interpersonal environments (e.g., sex ratio, population density, residential mobility), economic environments (e.g., wealth, income inequality, dominant economic activities), and political environments (e.g., democracy, welfare spending)" is considered, rather than individuals' perceptions of these environments.

However, socioecological psychology currently lacks a unified theory and is perhaps best characterized as an approach to psychological science where links between macro-environmental factors and cognitive/emotional/behavioral factors are explicitly modelled and intervening psychosocial processes investigated (Oishi, 2014). Instead of an overarching unified theory, a set of "mid-range" theories have been proposed that aim to construct more sophisticated explanatory accounts of the psychological impact of specific aspects of social ecology (e.g. residential mobility theory, pathogen prevalence theory) (Oishi, 2014; Oishi &

Talhelm, 2012). For example, pathogen prevalence theory would suggest that those living in areas with a high historical prevalence of infectious disease would be more cautious in their sexual behavior, tend to have fewer novel social interactions, and be less open to new experiences, findings that are supported by large-scale cross-national research (e.g. Schaller & Murray, 2012). Theoretical approaches from within geographical psychology, a subarea of socioecological research, have perhaps come closest to proposing a framework that begins to account for the macro-level causes of personality differences and how such individual differences manifest at the societal level (Rentfrow et al., 2008).

Macro level clustering of personality traits

Examining geographical variation has been a core approach to answering empirical questions in economics (e.g. by drawing on regional labor statistics), epidemiology and public health (e.g. by examining the clustering of disease incidence), and political science (e.g. by charting regional variation in voting patterns). Yet, this has not traditionally been the case within psychology. Geographical psychology aims to address this gap by understanding how psychological phenomena are spatially distributed and related to macro-level aspects of the environment (e.g. political, economic, social contexts). Crucially, a set of mechanisms have been suggested to underpin the systematic clustering of personality traits and the implications this may have for social structure (Rentfrow et al., 2008).

First, *selective migration* may be a key cause of the emergence and persistence of spatial clustering of personality differences. For example, conscientiousness people are goal motivated and strongly value paid employment and are particularly impacted by income losses (Boyce, Wood, & Brown, 2010; Boyce, Wood, & Ferguson, 2016). For these reasons, such individuals may seek out cities or regions with stable employment prospects. Those high in openness may gravitate to areas rich in cultural heritage, diversity, and intellectual stimulation where their personality and creativity can be expressed. Extraverts may tend to

migrate to areas where social and enterprising occupations are prevalent and their needs for social interaction and stimulating activities can be met. Residential mobility can be stressful and may provoke uncertainty, anxiety and loneliness, and as such may be avoided those with higher levels of neuroticism who are more vulnerable than others to such negative feelings (Oishi & Talhelm, 2012). Migration patterns may therefore have the effect of causing imbalances in the dispositional makeup of regions where certain traits become over- or under-represented as people move to areas that best satisfy their psychological needs (Rentfrow & Jokela, 2014).

Second, *social influence* may contribute to explaining differences in the personality traits of large concentrations of people. The actions of other people as captured by regional characteristics (e.g. college graduation rates, unemployment levels, occupational sectors, rates of divorce and criminal behavior) may produce personality differences. For instance, although unemployment may not reliably induce changes in neuroticism at the individual level (Bleidorn et al., 2018), the social norm of unemployment in one's local area has been shown to adversely impact well-being (Clark, Knabe, & Ratzel, 2010) and could impact neuroticism. In areas where criminal behavior is common, individuals may become less trusting and by persistently altering their responses to the social environment in this way they may become less agreeable over time (Fleeson, 2004; Rentfrow et al., 2008).

Further, where personality trait clustering already exists at the regional level, the behavioral expression of those traits may have an enduring impact on the cognitions, emotions, and actions of those within the region. For instance, people may tend to adopt cooperative behaviors in response to social environments where others tend to also cooperate, which may foster greater agreeableness over time. Research examining emotional contagion (e.g. Kramer, Guillory, & Hancock, 2014) suggests that residing in areas where neuroticism is common may lead to the transfer of negative emotions, potentially producing further

increases in neuroticism. Finally, *environmental influence* in the form of features of the natural and built environment such as climate, population density, soil quality, and green space, may also affect geographical variation in personality traits (Rentfrow & Jokela, 2014; Talhelm et al., 2014).

How patterns of selective migration and the impact of external social and environmental influences may combine to cause regional differences in personality traits to arise and endure over time is an open question. It is likely that the impact of these mechanisms is highly complex and dependent on historical and economic contexts and the existence of idiosyncratic social structures and contexts that must be considered. For example, Talhelm and colleagues (2014) explored the possibility that psychological differences between those living in the north and south of China arose from environmental influences that facilitated different systems of agricultural production. Specifically, the authors found that those living in southern areas where the climate has historically been most suitable for rice production showed a higher prevalence of holistic and interdependent thinking than those living in northern areas more suited to growing wheat. The authors suggest these differences emerged as a result of the cultural legacy of the highly cooperative work conditions of rice cultivation, which is associated with practices such as labor cooperation and the management of coordinated irrigation systems.

In another example, Obschonka et al. (2018) draw on fine-grained historical data and large-scale personality survey data (N = 381,916) to show that contemporary regional variation in personality traits in England and Wales can be traced back as far as the Industrial Revolution. Those living in areas once central to the Industrial Revolution in the 18th and 19th centuries experienced economic downturn and adversity following the decline of dominant large-scale coal-based industries throughout the 20th century. The authors show that the selective migration of more resilient individuals away from these old industrial regions and

the influence of persistent economic hardship may have produced a clustering of high levels of neuroticism and reduced conscientiousness in these regions. This study provides further evidence that the social legacy of work conditions may affect personality change. Further, in a follow-up study, Daly and colleagues (under review) demonstrate that the impact of the Industrial Revolution on the regional neuroticism levels of industrial areas may have contributed to the recent growth of obesity in these regions. As such, this research suggests that historical conditions may cause personality differences to become expressed at the macro-level with potential health implications.

Macro level expression of personality traits

To further develop understanding of the macro-level implications of the expression of personality, Rentfrow and colleagues (2008) propose a set of mechanisms underlying relationships between personality and social structure at the regional level. First, the authors propose that regions where a certain trait is prevalent will be disposed to make choices and engage in behaviors linked to that trait. For example, research on the predictive power of personality would suggest that in areas where extraversion is prevalent people may tend to socialize more frequently and work in enterprising occupations. People may be healthier in conscientious and less neurotic regions and be more creative and report more liberal attitudes in regions made up of a large portion of individuals who are open to experience. Further, in areas where people tend to be agreeable there may be a lower rate of criminality.

Interestingly, these intuitions are supported in both the individual-level literature and by large-scale estimates of the relationship between state-level personality and social indicators (Rentfrow et al., 2008).

However, it would be a mistake (known as the *individualistic fallacy* or *reverse ecological fallacy*) to assume that individual-level relationships can be aggregated to the regional or population level (Rentfrow, 2010). For instance, while conscientiousness reliably

predicts productivity and reduced criminal behavior at the individual-level, there is evidence that this may not be the case at the state-level (Rentfrow et al., 2008; Rentfrow, 2010). It is possible that the absence of such a relationship may be due to the influence of possible unobserved confounders. However, others examining micro-macro relations in psychology have noted that collectives formed through aggregation “have no individual-level counterpart”, and a key reason for this is that people change their behavior in response to social norms (van Raaij, 1984). It may therefore be the case that the expressions of personality traits at the regional or group level may have important implications for shaping social norms and perhaps even the formation of institutions.

For example, in regions where agreeableness is prevalent, crime rates have been found to be lower and it may be the case that public demand for prisons is therefore reduced (Rentfrow et al., 2008). Interest in arts and culture tends to be elevated in regions where openness to experience is high, potentially leading to demand for exhibition spaces and theatres where artists can promote and present their work. Healthcare needs may be more pronounced in areas where neuroticism is pervasive or aggregate conscientiousness levels are relatively low. Over time it is therefore possible that group-level personality may affect the formation of institutions such as courts, prisons, cultural centers, and hospitals. The existence (or absence) of these institutions may in turn produce a reinforcing “top-down” effect that further impacts the prevalence of certain personality traits over time (e.g. the presence of cultural centers enhances interest in the arts, which promotes openness to experience).

Taken together, there are several potential mechanisms and feedback loops that may be operating in unison to shape the macro-level clustering of personality traits at a given time-point. For this reason, it is challenging to identify the extent to which geographic differences in personality traits act as psychosocial forces that shape regional variation in macro-level social indicators, or conversely, whether social influences are causal factors

responsible for regional variation in personality. The increasing availability of repeated assessments of personality traits and geographical information will help establish the direction of influence and disentangle the relative importance of specific mechanisms (e.g. selective migration, social influence, environmental influence). For instance, it may be the case that the presence of social institutions (e.g. artistic and creative professions, universities) affects regional personality levels (e.g. increasing the prevalence of openness to experience) by attracting individuals to the city or region (i.e. a selective migration mechanism) rather than by inducing change in the personalities of those living in the area (i.e. a social influence mechanism).

An alternative approach is to draw on intervention studies to understand the factors that may lead to personality change. This research also helps further address the question as to whether personality traits are unchanging dispositions or whether they can be systematically modified by environmental or intentional change.

Personality change via intervention and policy

Parents invest sustained effort to foster behavioral tendencies that enable their children to succeed socially, academically, and economically later in life. Educators aim to promote qualities that enable children to reach their academic potential and governments seek to maximize ‘human capital’ to enable citizens to compete in an international labor market. People themselves engage with self-improvement and business motivation gurus and literatures to become more emotional stable, assertive, and effective in achieving their goals. These pursuits are all, at least partly, focused on intervening to induce personality change – a topic that has been central to developmental and educational psychology for decades but only recently emerged as a core topic within research on personality traits (Bleidorn et al., 2019).

For example, in their recent meta-analysis, Pandey et al. (2018) conclude that several intervention strategies (e.g. curriculum-based interventions, social and personal skills interventions, exercise and yoga and mindfulness interventions) may effectively improve childhood and adolescent self-regulation – thought to be a developmental antecedent of conscientiousness (Eisenberg, Duckworth, Spinrad, & Valiente, 2014). Self-regulation interventions were also associated with improvements in distal health and social outcomes including substance use, academic achievement, and conduct problems and social skills. In adulthood, the primary evidence for personality change comes from psychotherapy and pharmacological research aiming to ameliorate psychological difficulties such as depression and anxiety and personality disorder (Roberts et al., 2017). Whilst clinicians and those attending therapy may not explicitly discuss personality change or think in these terms, together they aim to reduce the pervasive feelings of depression, anxiety, self-consciousness and hostility which characterize neuroticism. Clinicians have also increasingly moved beyond a focus on the alleviation of suffering to foster positive functioning including positive emotions, enthusiasm, and social engagement which characterize extraversion (Duckworth, Steen, & Seligman, 2005).

Perhaps for these reasons, the effectiveness of psychotherapy has been shown to extend to personality change across the Big Five traits. A meta-analysis of over 200 clinical intervention studies identified robust pre-post intervention changes in emotional stability (i.e. neuroticism reversed) and extraversion (Roberts et al., 2017), though only emotional stability was found to be robustly increased when experimental interventions comparing treatment to control groups were examined. This is perhaps the strongest evidence to date suggesting that adult personality can change through intervention. By implication, large scale initiatives backed by policy-makers that aim to expand access to psychological therapies (e.g. The English Improving Access to Psychological Therapies (IAPT) program; Clark, 2018) may

have the effect of altering population neuroticism levels. This, in turn, may yield societal benefits given the close association between neuroticism and academic, relationship, occupational, and health difficulties (Roberts et al., 2007).

Similarly, by intervening to improve the self-regulation skills of children and adolescents, large-scale government schemes may have the effect of enhancing population conscientiousness levels, producing large-scale benefits (Eisenberg et al., 2014; Pandey et al., 2018). Already, evidence from long-running childhood intervention programmes such as the Perry Preschool Programme and the Abecedarian Project suggests that early life intervention-related improvements in externalizing behavior may mediate the intervention impact on key adult outcomes including smoking patterns and criminal behavior (Conti & Heckman, 2016; Heckman, Pinto, & Savelyev, 2013). In addition, observational evidence suggests that the broad lifelong benefits that could accrue from improving childhood self-control and adolescent conscientiousness may be substantial.

For example, a landmark study conducted in Dunedin, New Zealand, examined individual differences in the capacity for self-control among 1,000 children (Moffitt et al., 2011). The authors uncovered compelling evidence that more self-controlled children showed lower rates of school drop-out, early smoking initiation, and unplanned parenthood in their teenage years than other children. Further, those who could effectively control their impulses as children tended to avoid criminal behavior in adolescence and early adulthood and experienced few physical health or financial difficulties by age 32 years. When scaled to the societal level, the study results highlight how trait self-control may represent a potentially modifiable determinant of substantial costs to citizens and governments associated with healthcare usage, financial dependency, and crime (Caspi et al., 2016; Moffitt et al., 2011).

From a policy perspective, personality research may also assist in identifying the contexts where augmenting personality traits may yield the greatest effects. For instance, it

may be the case that the adverse effect of low conscientiousness or emotional stability on social mobility may be most pronounced among those already living in disadvantaged circumstances who do not have substantial alternative financial resources to rely on. This prediction termed the *resource substitution hypothesis* has gathered some support (Ayoub et al., 2018), though others have not observed a robust moderating pattern (Damian, Su, Shanahan, Trautwein, & Roberts, 2015). Moreover, other interactive effects between the person and broader context are possible. The *Matthew effect* (or “the rich get richer” effect) hypothesis predicts that personality will yield greater benefits among those growing up in more advantaged environments where individuals can draw on their social position and related resources to fully capitalize on the advantages of specific personality traits (e.g. a student with an interest in cultural and imaginative pursuits attending a costly college of art and design).

To date, the limited evidence available suggests that personality traits and background disadvantage may act independently to predict educational attainment, social class, and income in adulthood (Ayoub et al., 2018; Damian et al., 2015). This implies that personality traits could effectively ‘compensate’ for social disadvantage: those brought up in less affluent circumstances who are highly extraverted, conscientious or emotionally stable could fare as well economically as those who score low on these traits and are raised in wealthy circumstances. Augmenting personality to achieve such a rebalancing of prospects would require the roll out of scalable and acceptable strategies to modify what are typically relatively stable enduring patterns of thoughts, feelings, and behavior.

Yet, where such strategies are available it remains an open question whether governments should attempt to modify personality traits through the use of large-scale interventions and policy instruments. For instance, identifying ‘optimal’ levels of personality traits to promote in society requires linking personality to a relevant benchmark (e.g. a

composite indicator of socioeconomic status, health, and social connection) which may not be in the interest of all individuals. Further, interventions may operate differently at an aggregate scale than they do at the individual level as illustrated by ‘general equilibrium effects’ in the economics literature. For example, the extensive occupational benefits associated with high levels of extraversion could decline in a situation where this trait and related behaviours (e.g. taking charge, being active and affable) become widely available to employers. In particular, this may be the case if the additional ‘supply’ of extraverts is not met with an increase in demand for such employees. Conversely, a long-term rise in the prevalence of ‘economically valuable’ personality traits (Jokelaa, Pekkarinen, Sarvimäki, & Uusitalo, 2017) may be associated with continued or even rising returns where there is sufficiently strong demand for such traits across well-paid posts (e.g. as a factor in promotion to leadership positions; Edin, Fredriksson, Nybom, & Ockert, 2017).

An alternative strategy may be to match personality profiles to interventions to uncover “what works for who” and enhance the cost effectiveness of intervention programs (Chapman et al., 2014). In this way individual differences could be drawn upon to create interventions that are suited to individual needs and that may be welfare enhancing on a broad scale. To date, there have been a limited number of attempts to use personality measures to identify those at risk of adverse outcomes and most likely to benefit from specific interventions (Hirsh, Kang, & Bodenhausen, 2012). For example, there is evidence that chronically ill individuals with low levels of conscientiousness, who may have difficulty organizing their treatment regimes, may benefit particularly from self-management interventions (Franks, Chapman, Duberstein, & Jerant, 2009; Jerant, Chapman, Duberstein, & Franks, 2010). Intervention-strategies that are directly tailored to personality traits have also been shown to reduce substance use and mental health difficulties (Conrod, Castellanos, & Mackie, 2008; Edalti & Conrod, 2019). Another option for policy-makers may be to consider

universal intervention programs that do not directly target personality traits or require tailoring to personality types, but instead side-step the impact of certain personality traits. For instance, low conscientiousness (associated with disorganization and lack of planning) and neuroticism (associated with impulsivity) have been associated with difficulties in accumulating savings, which could be modified by large-scale “opt-out” or autoenrollment schemes that do not require a proactive deliberative approach to savings (Lades, Egan, Delaney, & Daly, 2017; Mosca & McCrory, 2016).

Finally, interventions and policy changes that assist individuals in finding a better person-environment fit could promote public welfare. Already, a large-scale analysis of German employees has shown that employees in jobs with demands that match their personalities earn substantially higher incomes (Denissen et al., 2018). Further, a “Big Data” examination of the personality traits of over 56,000 Londoners showed that those who are open to experience report greater life satisfaction in high density, ethnically diverse areas where others also tend to score highly on openness (Jokela, Bleidorn, Lamb, Gosling, & Rentfrow, 2015). Although based on observational data, these findings provide initial evidence that considering the context dependent effects of personality traits may yield welfare gains.

Conclusion

How are personality and social functioning and structure interrelated? Until recently the dominant ontogenetic perspective in personality psychology suggested a somewhat straightforward answer to this question: traits are enduring dispositions that, through a series of mediating channels, have broad and substantial consequences for social relationships, economic success, and human welfare (McCrae & Costa, 1994; Roberts et al., 2007). Taking a macro perspective on these findings, we can infer that personality traits shape the

composition of regions by driving selective migration as people seek out occupations and areas that fit their personalities and offer opportunities to satisfy their psychological needs (Rentfrow & Jokela, 2014). As a result, traits may become spatially clustered over time and their expression as behavioral tendencies may shape objective macro-environments including the economic and health characteristics of entire regions.

Yet, an account of personality differences solely as determinants of social outcomes and the social structure of groups and populations is incomplete. Personality traits change across the lifespan and both the stability and change in personality are influenced by environmental factors (Briley & Tucker-Drob, 2014). In recent years, personality researchers have capitalized on “Big Data” to link life transitions to personality change and highlight the impact of socialization on personality maturation. By doing so, this research has moved beyond the traditional focus of personality psychology on discrete effects of personality to instead build up an integrative account of how personality combines with and is affected by the social circumstances experienced throughout life (Roberts & Wood, 2006). This has motivated further attempts to unpick the dynamic interplay between personality traits and life events in representative longitudinal survey data. Further, at a macro-level, there is now evidence that objective environmental and social influences may induce enduring alterations in the personality traits of large concentrations of people with consequential welfare effects (e.g. Daly et al., under review; Obschonka et al., 2018; Talhelm et al., 2014).

Personality psychology has seen a long-awaited revival (Ryff, 1987) in research examining personality traits and social structure and has taken steps towards a contextualised, population-based account of this relationship that recognizes the complexity of both individuals and social systems (Oishi, 2014; Rentfrow et al., 2008; Roberts & Nickel, 2017). In the coming years, theoretically-informed sophisticated empirical evidence on specific life-transitions and social circumstances (e.g. Schwab & Bleidorn, 2019) will provide a more

complete response to House's (1981) question "when, how, and to what extent macro-social phenomena" affect the individual. Existing experimental and observational evidence has already provided a basis for understanding how systematic personality change may occur and the potential societal benefits that may follow (Bleidorn et al., 2019; Heckman et al., 2013; Moffitt et al., 2011). The development of a rich account of personality and social structure has the potential to inform policy-making and fundamentally reshape what is known about how personality can be incorporated into intervention design and policy change.

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