The Cambridge Handbook of Personality Psychology

Personality psychology is a rapidly maturing science making important advances on both conceptual and methodological fronts. *The Cambridge Handbook of Personality Psychology* offers a one-stop source for the most up-to-date scientific personality psychology. It provides a summary of cutting-edge personality research in all its forms, from DNA to political influences on its development, expression, pathology and applications. The chapters are informative, lively, stimulating and, sometimes, controversial and the team of international authors, led by two esteemed editors, ensures a truly wide range of theoretical perspectives. Each research area is discussed in terms of scientific foundations, main theories and findings, and future directions for research. With useful descriptions of technological approaches (for example, molecular genetics and functional neuroimaging) the *Handbook* is an invaluable aid to understanding the central role played by personality in psychology and will appeal to students of occupational, health, clinical, cognitive and forensic psychology.

PHILIP J. CORR is Professor of Psychology at the University of East Anglia.

GERALD MATTHEWS is Professor of Psychology at the University of Cincinnati.

The Cambridge Handbook of Personality Psychology

Edited by
Philip J. Corr
and
Gerald Matthews

CAMBRIDGE
UNIVERSITY PRESS

CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo, Delhi

Cambridge University Press
The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org
Information on this title: www.cambridge.org/9780521680516

First published 2009

Printed in the United Kingdom at the University Press, Cambridge

A catalogue record for this publication is available from the British Library

Library of Congress Cataloguing in Publication data
The Cambridge handbook of personality psychology / edited by Philip J. Corr and Gerald Matthews.
p. cm.
ISBN 978-0-521-86218-9 (hdbk : alk. paper) – ISBN 978-0-521-68051-6 (pbk : alk. paper)
1. Personality. I. Corr, Philip J. II. Matthews, Gerald. III. Title.
BF698.C155 2009
155.2–dc22

2009019281

ISBN 978-0-521-86218-9 hardback
ISBN 978-0-521-68051-6 paperback

Contents

Figures

Tables

Contributors

PHILLIP L. ACKERMAN, Georgia Institute of Technology

NEIL ANDERSON, University of Amsterdam

JENS B. ASENDORPF, Humboldt-Universität Berlin

R. MICHAEL BAGBY, University of Toronto

MICHAEL HARRIS BOND, Chinese University of Hong Kong

GREGORY J. BOYLE, Bond University

ANDREA L. BRIGGS, DePaul University

GILES ST J. BURCH, University of Auckland

TURHAN CANLI, Stony Brook University

DAVID CANTER, University of Liverpool

GIANVITTORIO CAPRARA, University of Rome

CHARLES S. CARVER, University of Miami

DOUGLAS F. CELLAR, DePaul University

GORDON CLARIDGE, University of Oxford

SUSAN CLONINGER, The Sage Colleges

ELISABETH D. CONRADT, University of Oregon

PHILIP J. CORR, University of East Anglia

SHARON DAWE, Griffith University

IAN J. DEARY, University of Edinburgh

BOELE DE RAAD, University of Groningen

EDWARD L. DECI, University of Rochester

COLIN G. DEYOUNG, Yale University

M. BRENT DONNELLAN, Michigan State University

JURIS G. DRAGUNS, Pennsylvania State University

MARKO ELOVAINIO, University of Helsinki

AURELIO JOSÉ FIGUEREDO, University of Arizona

DAVID C. FUNDER, University of California, Riverside

PAUL GLADDEN, University of Arizona

RAPSON GOMEZ, University of Tasmania

SAMUEL D. GOSLING, University of Texas at Austin

JEREMY R. GRAY, Yale University

ROBERT D. HARE, University of British Columbia and Darkstone Research Group

B. AUSTIN HARLEY, University of Texas at Austin

EDWARD HELMES, James Cook University

ROBERT HOGAN, Hogan Assessment System

LAURI A. JENSEN-CAMPBELL, University of Texas at Arlington

DANIEL NELSON JONES, University of Arizona

MIKA KIVIMÄKI, University of Helsinki

JENNIFER M. KNACK, University of Texas at Arlington

JAMES T. LAMIELL, Georgetown University

NATALIE J. LOXTON, University of Queensland

GEOFF MACDONALD, University of Toronto

GERALD MATTHEWS, University of Cincinnati

ROBERT R. MCCRAE, National Institute on Aging

MARIO MIKULINCER, Bar-Ilan University

STEPHANIE N. MULLINS-SWEATT, University of Kentucky

MARCUS R. MUNAFÒ, University of Bristol

VICKIE NAM, University of California, Santa Cruz

CRAIG S. NEWMANN, University of North Texas

RAINER REISENZEIN, University of Greifswald

MADELINE REX-LEAR, University of Texas at Arlington

RICHARD W. ROBINS, University of California, Davis

MICHAEL D. ROBINSON, North Dakota State University

MARY K. ROTHBART, University of Oregon

RICHARD M. RYAN, University of Rochester

GERARD SAUCIER, University of Oregon

MICHAEL F. SCHEIER, Carnegie Mellon University

CONSTANTINE SEDIKIDES, University of Southampton

PHILLIP R. SHAVER, University of California, Davis

BRAD E. SHEESE, University of Oregon

YUICHI SHODA, University of Washington

RONALD E. SMITH, University of Washington

ALICE F. STUHLMACHER, DePaul University

RHONDA SWICKERT, College of Charleston

AVRIL THORNE, University of California, Santa Cruz

DAVID D. VACHON, University of Toronto

GENEVA VÁSQUEZ, University of Arizona

MICHELE VECCHIONE, University of Rome

SETH A. WAGERMAN, University of California, Riverside

FIONA WARREN, University of Surrey

HANNELORE WEBER, University of Greifswald

THOMAS A. WIDIGER, University of Kentucky

PEDRO SOFIO ABRIL WOLF, University of Arizona

DONNA YOUNGS, University of Liverpool

MOSHE ZEIDNER, University of Haifa

Abbreviations

A	Agreeableness
ACC	anterior cingulate cortex
ADHD	attention deficit hyperactive disorder
APA	American Psychiatric Association
APD	antisocial personality disorder
APIM	actor-partner independence model
APSD	Antisocial Process Screening Device
ARAS	ascending reticular activating system
BAS	behavioural approach system
BED	binge eating disorder
BFI	Big Five Inventory
BIS	behavioural inhibition system
BPI	Basic Personality Inventory
C	Conscientiousness
CAPS	cognitive-affective processing system
CAQ-sort	California Adult Q-sort
CAQ	Clinical Analysis Questionnaire
CBT	cognitive-behavioural therapy
CD	conduct disorder
CFA	confirmatory factor analysis
cns	conceptual nervous system
CNS	central nervous system
CPAI	Chinese Personality Assessment Inventory
CPS	Child Psychopathy Scale
CR	conditioned response
CS	conditioned stimulus
DAPP	Dimensional Assessment of Personality Pathology
DBT	dialectical behaviour therapy
DIF	differential item functioning
DTC	democratic therapeutic community
E	Extraversion
ECR	Experiences in Close Relationships
EFA	exploratory factor analysis
EI	emotional intelligence
FFM	Five-Factor Model
FFFS	fight-flight-freeze system
FFS	fight-flight system
FHID	factored homogeneous item dimension

fMRI	functional magnetic resonance imaging
FUPC	first unrotated principal component
GAS	general adaptation syndrome
HPI	Hogan Personality Inventory
HRM	human resource management
IAPS	International Affective Picture Series
IAS	Interpersonal Adjective Scale
ICD	International Classification of Diseases
IO	industrial/organizational
IRT	item response theory
LGM	latent growth model
LPFC	lateral prefrontal cortex
MBT	mentalization-based treatment
MDS	multidimensional scaling
MedPFC	medial prefrontal cortex
MMPI	Minnesota Multiphasic Personality Inventory
MPQ	Multidimensional Personality Questionnaire
N	Neuroticism
NA	negative affectivity
NEO-FFI	NEO Five-Factor Inventory
NEO-PI-R	Revised NEO Personality Inventory
O	Openness to Experience
OCD	obsessive-compulsive disorder
ODD	oppositional defiant disorder
O-LIFE	Oxford-Liverpool Inventory of Feelings and Experiences
P	Psychoticism
PA	positive affectivity
PAI	Personality Assessment Inventory
PANAS	Positive and Negative Affect Scale
PCL	Psychopathy Checklist
PCL–R	Psychopathy Checklist–Revised
PD	personality disorder
PDNOS	personality disorder not otherwise specified
PFC	prefrontal cortex
PPI	Psychopathy Personality Inventory
QTL	quantitative trait loci
ROI	regions of interest
ROV	regions of variance
RST	Reinforcement Sensitivity Theory
16PF	Sixteen Personality Factor Questionnaire
SDT	self-determination theory
SEL	social and emotional learning
SEM	structural equation modelling
SIT	sustained information transfer
SNAP	Schedule for Nonadaptive and Adaptive Personality
SPQ	Schizotypal Personality Questionnaire
SRL	self-regulated learning

SRM	social relations model
SRP	Self-Report Psychopathy
SSSM	standard social science model
STM	short-term memory
SWB	subjective wellbeing
TCI	Temperament and Character Inventory
TIE	typical intellectual engagement
TMI	transmarginal inhibition
UCR	unconditioned response
UCS	unconditioned stimulus
YPI	Youth Psychopathic Traits Inventory

Preface

The study of personality requires an unusual feat of mental vision. Those of us who work in this field must focus narrowly on one or more specialized research topics, while simultaneously maintaining a wide-angle view of personality in a broader sense. The day-to-day demands of doing research can make it hard to preserve the broader focus, especially when immediate research projects are progressing well. The aim of this Handbook is to assist researchers, practitioners and students to regard the larger picture of personality research. Recent years have seen a resurgence of interest in personality, directed along lines of research that sometimes converge and sometimes seem to diverge. Our motivation in compiling this Handbook was to provide a general overview of the many areas of study that together define this branch of psychological science – that many of us consider to be becoming increasingly relevant and important in psychology more generally.

The contributors to this Handbook rose to their task admirably, producing relatively brief summaries of their respective areas of expertise in an accessible style that are intended to inform and stimulate, and at times provoke. We instructed contributors to present their material in a way that they thought most appropriate: our concern was to ensure that chapters were presented in the way that best suited the topics – as a result, some chapters are longer than others, and some topics are divided over several chapters. We offer a collective 'thank you' to all contributors not only for producing such high-quality chapters but also for their forbearance in the production process which, as a result of the number of chapters, was slower than anticipated. We can only hope that contributors are pleased by the finished Handbook.

We are very grateful to Cambridge University Press for agreeing to publish this work; especially to Sarah Caro, Commissioning Editor, for her constant encouragement and advice, and then, after Sarah's departure, to Andrew Peart and Carrie Cheek for their patience and skill in bringing this project to fruition. Gerald Matthews wishes to thank the University of Cincinnati for allowing a period of sabbatical leave, and the Japan Society for the Promotion for Science for supporting a study visit to the University of Kyushu, which assisted him in his editorial role.

Philip J. Corr
Gerald Matthews

Editors' general introduction

Philip J. Corr and Gerald Matthews

Personality psychology has never been in better health than at the present time. The idea that we can describe and measure meaningful stable traits, such as extraversion and emotionality, is no longer very controversial (though see James T. Lamiell, Chapter 5). The study of traits has been boosted by, at least, a partial consensus among researchers on the nature of the major traits, by advances in genetics and neuroscience, and by increasing integration with various fields of mainstream psychology (Matthews, Deary and Whiteman 2003). Other perspectives on personality have also flourished, stimulated by advances in social-cognitive theory (Cervone 2008; Ronald E. Smith and Yuichi Shoda, Chapter 27), by the rediscovery of the unconscious and implicit personality processes (Bargh and Williams 2006), and by increasing interest in the relationship between emotion and personality (Rainer Reisenzein and Hannelore Weber, Chapter 4). The growing prominence of personality as an arena for an integrated understanding of psychology (Susan Cloninger, Chapter 1) has motivated the present Handbook. In this introductory chapter, we provide a brief overview of the main issues, themes and research topics that are addressed in more depth by the contributors to this volume.

Despite contemporary optimism, the study of personality has often been contentious and riven by fundamental disputes among researchers. A persistent issue is the nature of personality itself: what issues are central to investigating personality, and which properly belong to other sub-disciplines of psychology? At times, it has seemed as though different schools of 'personality' research have been addressing entirely different topics. Until quite recently, there was little communication between biologically and socially oriented researchers, for example. Debates in the field tended to devolve into rigid dichotomies, forcing researchers into one camp or another:

- Is personality a 'nomothetic' quality, described by general principles applying to all individuals? Or should personality be studied 'idiographically', focusing on the uniqueness of each individual?
- Does behaviour primarily depend on personality, or is it more powerfully shaped by situation and context?
- Is personality infused into conscious experience, so that people can explicitly describe their own traits? Or, as Freud argued, is much of personality unconscious, so that people lack insight into their own natures?

- Is personality primarily a consequence of individual differences in brain functioning, or of social learning and culture?
- Is personality mainly determined by the individual's DNA, or by environmental factors? (note that this dichotomy is not the same as the preceding one: environment affects brain development)
- Is personality fixed and stable throughout adulthood, or does the person generally change over time, and perhaps grow into maturity and wisdom?

The increasing wisdom of the field is suggested by progress in finding satisfying syntheses to these various dialectics, including a recognition of the importance of person-situation interaction in shaping behaviour, and the intertwining of genes and environment (and brain and culture) in personality development (Matthews, Deary and Whiteman 2003). Nonetheless, important and sometimes fundamental differences in perspective remain (Caprara and Cervone 2000). Many contributors to the present Handbook approach personality via the resurgent notion of stable personality traits that exert a wide-ranging influence on many areas of psychological functioning. The editors' own work aligns with this perspective. However, it is important to present a historical perspective on the controversies within the field, to examine critically the core assumptions of trait theory, and to expose some of the fissures that remain within different versions of this theory. Part I of this Handbook briefly introduces some of the basic conceptual issues that have shaped inquiries into personality.

The historical arc that has seen trait psychology go into and out of favour may (most simply) reflect the changing dialectic between scientific and humanistic approaches noted by Susan Cloninger (Chapter 1). One can do personality research as a 'hard' or natural science without subscribing to universal traits, as demonstrated by work on 'behavioural signatures' (the *individual*'s consistencies in behaviour across different environments: e.g., Shoda 1999). However, trait theories have had a lasting appeal through their aspirations towards a universal measurement framework (akin to Cartesian mapping of the Earth or the periodic table), and their relevance to all branches of personality theory. Nonetheless, trait theory does not satisfy those seeking to understand the individual person, or the intimacy of the person-situation relationship, or the humanists that want to help humankind. Contributors to Part I of this Handbook address some of the central issues that define a struggle for the soul of personality theory. We especially highlight (1) the psychological meaning of measures of personality, (2) the role of personality in predicting behaviour, and (3) the holistic coherence of personality.

There are some points of agreement that are close to universal, at least among scientifically-oriented researchers. As further explored in Part II of this Handbook, personality researchers have a special concern with the meaning of measurements of personality (whatever the particular scale or instrument). Numerical measurements must be anchored by some process of external validation to reach theoretical understanding. For example, a theory that specifies multiple brain systems

allows us to link the numbers we get from personality scales to parameters of those systems (Philip J. Corr, Chapter 21), and to make predictions about how trait measurements relate to objective measurements of brain functioning (e.g., from functional magnetic resonance imaging, fMRI). We are right to be wary of the factor analysis of questionnaires interpreted without such theoretical and external referents.

Another basic concern is the prediction of behaviour (whether at individual or group level). We are all interactionists now, in accepting the importance of both person and situation factors, but the simple acknowledgement of interaction does not take us very far (see Seth A. Wagerman and David C. Funder, Chapter 2; Jens B. Asendorpf, Chapter 3). At the least, we need both a fine-grained understanding of how personality factors bias the dynamic interaction between the individual and the environment in some given social encounter, as well as a longer-focus understanding on how personality and situations interact developmentally over periods of years, or even decades (see M. Brent Donnellan and Richard W. Robins, Chapter 12).

A focus on the general functioning of the person, emerging from many individual components or modules, is a further common theme. There is a tension between the idea of a coherent self and several features of biological science, including the division of the brain into many functionally distinct areas (neuroscience), the determination of brain structure by multiple genes (molecular genetics), and the evolution of the brain to support multiple adaptive modules (evolutionary psychology). Contrasting with these fissile tendencies, if there is one issue on which most personality psychologists agree, it is that the whole is more than the sum of the parts. Comparable difficulties in finding personality coherence also arise in social-cognitive approaches which discriminate multiple cognitive, affective and motivational processes underlying personality (Caprara and Cervone 2000). Should we see personality as a fundamental causal attribute of the brain that, in Jeffrey Gray's (1981) phrase, becomes a great flowering tree as it guides the development of many seemingly disparate psychological functions? Or does personality coherence reside in the idiosyncratic schemas that lend unique meanings to the lives of individuals (Caprara and Cervone 2000)? Or is personality coherence functional rather than structural in nature, reflecting the person's core goals and strategies for adaptation to the major challenges of life (Matthews 2008a)? Defining personality in some holistic sense, as opposed to a collection of functional biases in independent modules, may be informed by integration of personality and emotion research. As discussed by Rainer Reisenzein and Hannelore Weber (Chapter 4), the study of emotion has similar integrative aims.

Trait researchers pursue 'normal science' (Kuhn 1962), in that they share common core assumptions about the nature of personality. There is a reasonable degree of consensus on dimensional models, the importance of both biology and social factors, and person x situation interaction. Some alternative perspectives on personality, such as those grounded in social constructivism, are clearly outside the paradigm. Social-cognitive perspectives appear to be in the process of

negotiating their stance towards trait models. Some aspects of social-cognitive research use normative trait-like measures (e.g., self-esteem), and might be integrated with the trait paradigm (Michael D. Robinson and Constantine Sedikides, Chapter 26). Other aspects that take an idiographic view of personality coherence (Caprara and Cervone 2000) may represent an alternative paradigm.

This volume primarily covers the various expressions and applications of trait theory as the dominant paradigm in personality, while recognizing the important contributions of social-cognitive models (Ronald E. Smith and Yuichi Shoda, Chapter 27) and the idiographic (Auril Thorne and Vickie Nam, Chapter 28) and humanistic (Edward L. Deci and Richard M. Ryan, Chapter 25) traditions of the field. The remainder of this introductory chapter briefly highlights key issues relating to the focal issues reflected in the section structure of the book: measurement issues, theoretical stances (biological, cognitive and social), personality development, the role of culture, and applications.

Measurement of personality

Measurement issues may be broken down into a series of interlinked questions. First, should quantitative measurements be at the center of personality research at all? Answers in the negative would come from psychodynamic theorists, and from social constructivists (cf., Avril Thorne and Vickie Nam, Chapter 28). There are also those who challenge the basic assumptions of psychometric methods used in personality assessment (James T. Lamiell, Chapter 5), or even the validity of any psychological measurement (Barrett 2003). For the most part, however, personality researchers share the assumption that scientific tests of personality theory require quantitative assessments of personality. Typically, it is dimensional traits such as extraversion, anxiety and sensation-seeking which are assessed, but personality characteristics unique to the individual may also be quantified (Ronald E. Smith and Yuichi Shoda, Chapter 27).

Assuming that measurement is desirable, the next question is what do we measure? As Ian J. Deary (Chapter 6) points out, Gordon Allport raised a question that still awaits an answer: what is the basic unit of personality? In practice, various sources of trait data have been used, following Raymond Cattell's classification (see Gregory J. Boyle and Edward Helmes, Chapter 7), that distinguishes self-reports (which need not be accepted at face value), objective behaviours and life-record data. Questionnaire assessments of traits are familiar, and need no introduction. The major structural models of personality such as the Five-Factor Model (FFM) (Robert R. McCrae, Chapter 9) are largely based on questionnaire scales, although they gain authority from evidence on the convergence of self-report with other measurement media, such as the reports of others on the personality of the individual (Goldberg 1992). Assessment may also be reconfigured by the resurgence of interest in the unconscious. Implicit personality dimensions distinct from self-report dimensions assessed via behavioural techniques based on

speed of response to trait-relevant stimuli are promising, although psychometric challenges remain (Schnabel, Banse and Asendorpf 2006).

Having chosen a data source, the next issue for trait researchers is what specific analytic techniques should be used to identify and discriminate multiple dimensions of personality (Gregory J. Boyle and Edward Helmes, Chapter 7). The traditional tool here (Cattell 1973) is exploratory factor analysis (EFA), which assigns the reliable variance in responses (e.g., on a questionnaire) to a reduced set of underlying factors or dimensions. For example, factor analysis of the various English-language verbal descriptors of personality suggests that most of the variation in response can be attributed to just five underlying factors that provide a comprehensive description of personality in this medium (Goldberg 1990). EFA, however, is subject to various limitations, including the existence of an infinite number of mathematically-equivalent factor solutions (alternate 'rotations'), different principles for factor extraction, and the lack of any definitive method for deciding on the key question of how many factors to extract (Haig 2005). These difficulties have been known from the beginning of research using factor analysis, and most theorists have advocated using factor analysis only in conjunction with other approaches that may provide converging evidence, such as discriminating clinical groups and performing experimental investigations (Eysenck 1967).

As Gregory J. Boyle and Edward Helmes (Chapter 7) discuss, interest is growing in 'modern' methods for scale construction that contrast with classical test theory; these methods include item response theory and Rasch scaling. Multivariate methods that complement or replace traditional EFA have also become increasingly sophisticated. The single most important advance may be the development of confirmatory techniques, which are used to test whether or not a factor model specified in advance fits a given data set. Testing goodness of fit provides some protection against making too much of the serendipitous factor solutions that may emerge from EFA. Confirmatory factor analysis is itself one instance of a larger family of structural equation modelling techniques that allow detailed causal models to be tested against data (Bentler 1995).

The final set of questions concerns the nature of the measurement models that emerge from the application of multivariate statistical methods. For many years, debate over the structure of personality revolved around disputes over the optimal number of factors for personality description. Famously, Cattell advocated sixteen (or more) factors, whereas Eysenck preferred a more economical three. The Five-Factor Model represents the most popular resolution of the debate (Robert R. McCrae, Chapter 9), although there remain significant dissenting voices (e.g., Boyle 2008). In addition, disputes can to some extent be resolved within hierarchical, multilevel models that differentiate broad superfactors such as the 'Big Five', along with more numerous and narrowly defined 'primary' factors (Boele De Raad, Chapter 8).

A more subtle issue is how to discriminate dimensions of personality from other domains of individual differences, especially intelligence (Phillip L. Ackerman, Chapter 10). The term 'personality' is sometimes used in a wider sense to refer to

the full spectrum of personal characteristics, including abilities. Careful psychometric modelling can help to resolve the boundaries of different domains within this broader sphere of individual differences. The new construct of 'emotional intelligence' is an example of the problems that may arise. Different versions of the construct have been proposed that seem variously to belong in either the ability or personality domain, or some no man's land in between (Matthews, Zeidner and Roberts 2007).

Developmental processes

Given that we can assess personality descriptively, one of the next fundamental issues to consider is personality development. How do our personalities originate? How do they change over time? What psychological processes support development? Broadly, two rather different perspectives have been adopted historically. An essentialist position (see Haslam, Bastian and Bissett 2004) supposes that individuals have a rather stable nature, evident early in childhood, which is perpetuated, with minor changes, throughout the lifespan. This position is compatible with a strong hereditary component to personality and a view that biology is destiny. Conversely, in the spirit of J. B. Watson, we may see personality as accumulating over time through significant learning experiences. Theories as various as psychoanalysis, traditional learning theory and modern social-cognitive theory have all seen learning as central to personality. Such approaches tend to suggest a more malleable view of personality.

Understanding development breaks down into a number of discrete research issues, including measurement models for the lifespan, identifying qualitative differences between child and adult personality, modelling the processes that contribute to development, and linking personality development to the person's broader experience of life and wellbeing. Contributors to this volume address some of the key issues involved.

Assessment and continuity of personality in the early years are often attacked via studies of temperament. The general idea is that even infants may show rudimentary qualities such as emotionality and activity. These basic 'temperaments' may persist into adulthood, for example as positive and negative emotionality, and also provide a platform for development of more sophisticated personality attributes. It is sometimes assumed that temperament is closer to biological substrates than adult personality, which is more strongly influenced by social-cultural factors (Strelau 2001). Just as with adult personality, we can investigate the dimensional structure of temperament, although, with young children, the primary data source must be observations of the child's behaviour rather than self-report.

One of the most parsimonious and also most influential models of temperament is that proposed by Rothbart and Bates (1998; Mary K. Rothbart *et al*., Chapter 11). Its major dimensions include Surgency/Extraversion (including activity and

sociability), negative affectivity and effortful control, all of which may be identified through observational methods. A key question is the extent to which childhood temperament shows continuity with adolescent and adult personality. Do active children become extraverted adults? Do 'whiny' infants become emotionally unstable in later life? The consensus on such issues is that temperament does indeed predict adult personality, although personality may be somewhat unstable during the childhood years. An important line of research constitutes longitudinal studies that track temperament, personality and real-life behaviours of periods of years. For example, the Dunedin study in New Zealand has tracked around one thousand infants into adulthood, and demonstrated that childhood temperament is modestly but reliably predictive of adult personality and further criteria including criminal behaviour and mental disorder (e.g., Caspi, Harrington, Milne *et al*. 2003).

As M. Brent Donnellan and Richard W. Robins (Chapter 12) discuss, the FFM has proved a useful framework for investigating both stability and change in personality over the lifespan. Factor analytic studies confirm the convergence of personality and temperament dimensions (Strelau 2001). We should note that factorial convergence does not preclude qualitative changes in the nature of the dimension over time.

Coupled with statistical modelling of personality change over the lifespan is a concern with the underlying processes driving change and stability. We prefigure our later discussion of personality theory by indicating several avenues towards understanding development. The grounding of temperament in biology points towards the role of neuroscience. There are good correspondences between the fundamental dimensions of temperament and some of the key constructs of biological theories of personality (Mary K. Rothbart *et al*., Chapter 11). Importantly, brain development depends on both genes and environmental influences, and, as genes may become active at different ages, genetic influences may incorporate personality change. Cognitive and social processes are also critical for personality development. Traits such as Extraversion and Neuroticism are associated with biases in cognitive functioning that confer, for example, an aptitude for acquiring social skills in extraverts, and heightened awareness of threat in high neurotic persons (Matthews 2008a). Self-regulative theories (Charles S. Carver and Michael F. Scheier, Chapter 24; Michael D. Robinson and Constantine Sedikides, Chapter 26) have addressed how cognitive representations of the self mediate the individual's attempts to satisfy personal goals in a changing external environment. Furthermore, cognitive development takes place within a social context (Bandura 1997) that may powerfully affect personality, for example, in relation to exposure to role models, internalization of cultural norms and educational experiences (Moshe Zeidner, Chapters 41, 42).

Most researchers accept that neural, cognitive and social processes interact in the course of personality development, although building and validating detailed models of the developmental process is difficult. Two examples will suffice. There is a growing appreciation that research on personality and health should be placed in the context of the lifespan (Marko Elovainio and Mika Kivimäki, Chapter 13).

Activities such as smoking and exercise exert their effects over long intervals. Whiteman, Deary and Fowkes (2000) suggested that a full understanding of personality requires the integration of two models, a structural weakness model that focuses on internal vulnerabilities (e.g., genetic predispositions to illness), and a psychosocial vulnerability model that focuses on external factors such as life/work stress. Cognitive factors such as choosing health-promoting coping strategies may play a mediating role.

Similarly, development of emotional competence depends on the interaction between biologically-based elements of temperament that confer emotionality on the child, and social learning processes, such as modelling of emotional response. Individual differences in brain systems for handling reward and punishment stimuli (Philip J. Corr, Chapter 21) may govern whether children develop cheerful or distress-prone temperaments, respectively. However, the distress-prone child may still grow up to be well-adapted if he or she learns effective strategies from parents and peers for coping with vulnerability to negative emotion. Cognitions are also critical in that language capabilities influence the child's capacity to understand and express emotion. Traits such as emotional intelligence emerge from this complex and enigmatic interactional process (Zeidner, Matthews, Roberts and McCann 2003).

Finally, in this section, we note the resurgence of one of the grand theories of personality, John Bowlby's attachment theory, reviewed in this volume in two chapters authored by Phillip R. Shaver and Mario Mikulincer (Chapters 14, 15). Bowlby's insight was that the child's pattern of relationships with its primary care-giver affected adult personality; secure attachment to the care-giver promoted healthy adjustment in later life. The theory references many of the key themes of this review of personality. Attachment style may be measured by observation or questionnaire; a common distinction is between secure, anxious and avoidant styles (Ainsworth, Blehar, Waters and Wall 1978). It also corresponds to standard traits; for example, secure attachment correlates with Extraversion and Agreeableness (Carver 1997). Attachment likely possesses biological aspects (evident in ethological studies of primates), social aspects (evident in data on adult relationships), and cognitive aspects (evident in studies of the mental representations supporting attachment style) (Phillip R. Shaver and Mario Mikulincer, Chapter 14). As with other personality theories, a major challenge is developing a model that integrates these different facets of the attachment construct.

Theories of personality

Allport (1937) saw personality traits as possessing causal force. Traits correspond to 'generalized neuropsychic structures' that modulate the individual's understanding of stimuli and choice of adaptive behaviours. Thus, traits represent more than some running average of behaviour. For example, we could see trait anxiety as simply the integral of a plot of state anxiety over time, but this perspective tells us nothing about the underlying roots of vulnerability to anxiety.

A theory of the trait is required to understand the causal basis for stability in individual differences, and the processes that incline the person to view stimuli as threatening, and to engage in defensive and self-protective behaviours.

One of the hallmarks of personality theory is the diversity of explanatory concepts it invokes (Susan Cloninger, Chapter 1). We could variously attribute trait anxiety to sensitivity of brain systems controlling response to threat, to cognitive processes that direct attention to environmental threat, or to culture-bound socialization to see oneself as threat-vulnerable. Three sections of this Handbook address three major perspectives that mould contrasting theories. According to biological perspectives, personality is a window on the brain. Hans Eysenck and Jeffrey Gray articulated the influential view that individual differences in simple but critical brain parameters, such as arousability and sensitivity to reinforcing stimuli, can drive far-reaching personality changes, expressed in traits such as Extraversion and Neuroticism. These theories emphasized the role of individual differences in genes for brain development (polymorphisms) in generating personality variation (in conjunction with environmental factors). As a broad research project, biological theory thus emphasizes studies of behaviour and molecular genetics, psychophysiology, and the linkage between neuroscience and real-world behavioural functioning, including clinical disorder.

Cognitive and social-psychological theories bring different issues into the foreground of research. The essence of cognitive theories is that personality is supported by differing representations of the world, and the person's place within it, coupled with individual differences in information-processing. For example, Aaron Beck (Beck, Emery and Greenberg 2005) attributed depression to the negative content of self-schema, such as beliefs in personal worthlessness. Emotional pathology also relates to biases in attention, memory and strategies for coping. A major feature of cognitive approaches is the use of the experimental methods of cognitive psychology to link traits to specific components of information-processing. These approaches typically link cognition to real-life behaviour and adaptation through self-regulative models that seek to specify stable individual differences in the processing supporting goal attainment (Charles S. Carver and Michael F. Scheier, Chapter 24).

Social psychological accounts focus on the interplay between personality and social relationships (Lauri A. Jensen-Campbell *et al*., Chapter 29), and several interlocking issues. These include the extent to which personality characteristics (including traits) arise out of social interaction, the reciprocal influence of personality on social interaction, and the role of culture in modulating these relationships. Biological and cognitive theories typically conform to a natural sciences model, but at least some variants of social psychological theory owe more to the idiographic and humanistic traditions of the field discussed by Susan Cloninger (Chapter 1). A vigorous research programme that looks back to the social learning theories of Walter Mischel and Albert Bandura combines elements of both cognitive and social psychology within an idiographic framework (Caprara and Cervone 2000; Ronald E. Smith and Yuichi Shoda, Chapter 27).

In a sense, each research tradition may stand alone. Each has its own distinct research agenda and methods supporting a self-contained domain of scientific discourse. However, each perspective on theory faces contemporary challenges that are a product of previous progress. We will review these shortly. The more general point to emphasize is that there is increasing convergence between different approaches. Cognitive and social neuroscience approaches are increasingly infusing personality research, and it is also clear that core social-psychological constructs, such as the self-concept, overlap with trait-based constructs (Matthews, Deary and Whiteman 2003). There are still unresolved issues regarding the extent to which, for example, cognitive and social accounts of personality may be reduced to neuroscience (Matthews 2008b; Corr and McNaughton 2008). It can be agreed, though, that there has never been a greater need for proponents of different research traditions to talk to one another in the service of theoretical integration.

Next, we reflect briefly on some of the main challenges for each theoretical perspective, which are taken up by contributors to this volume.

Neuroscience

The neuroscience of personality has advanced considerably from Hans Eysenck's (1981) pioneering efforts to advance biological models as a new Kuhnian paradigm for the field. Genetic studies, psychophysiology and 'the neuroscience of real life' have all made major advances. The leading biological theories, such as Reinforcement Sensitivity Theory (Philip J. Corr, Chapter 21), aim to integrate various strands of evidence in delineating the neuroscience of personality.

The case of heritability of personality was originally based on behaviour genetics, and the finding that the similarity between related individuals, such as siblings, related to their degree of genetic similarity (Johnson, Vernon and Mackie 2008). The attribution of around 50 per cent of the variance in major personality traits to heritability is uncontroversial. The field has also tackled such important issues as non-additive effects of genes and gene-environment interaction. Studies of personality variation within a given population are not, however, informative about the mechanisms through which genes build the individual brains that differ in the familiar personality traits.

There is currently some excitement about the prospects for molecular genetics, i.e., identifying polymorphisms (different variants of the same gene) that may produce individual differences in neural functioning and ultimately observed personality. Approaches focusing on genes for neurotransmitter function have had some success in linking personality to DNA (Marcus R. Munafò, Chapter 18). The search is on for 'endophenotypes' – highly specific traits that are shaped by the genes and influence broader personality traits and vulnerability to mental illness. At the same time, the likely complexity of mappings between genes, brain systems and behaviour may present a barrier to future progress (Turkheimer 2000).

There is also growing interest in the evolutionary basis for human neural functioning. Initially, evolutionary psychology was more concerned with personality in the sense of 'how all people are the same', rather than with individual differences.