

Edited by

Robert J. Coplan | Julie C. Bowker | Larry J. Nelson

The Handbook of
SOLITUDE

*Psychological Perspectives on Social Isolation,
Social Withdrawal, and Being Alone*

SECOND EDITION



WILEY Blackwell

The Handbook of Solitude

The Handbook of Solitude

*Psychological Perspectives on Social Isolation,
Social Withdrawal, and Being Alone*

Second Edition

Edited by

Robert J. Coplan
Carleton University
Ottawa, ON
Canada

Julie C. Bowker
University at Buffalo, SUNY
Buffalo, NY
USA

Larry J. Nelson
Brigham Young University
Provo, UT
USA

WILEY Blackwell

This edition first published 2021
© 2021 John Wiley & Sons, Inc.

Edition History

John Wiley & Sons, Inc. (1e, 2014)

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, except as permitted by law. Advice on how to obtain permission to reuse material from this title is available at <http://www.wiley.com/go/permissions>.

The right of Robert J. Coplan, Julie C. Bowker, and Larry J. Nelson to be identified as the authors of the editorial material in this work has been asserted in accordance with law.

Registered Office

John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, USA

Editorial Office

111 River Street, Hoboken, NJ 07030, USA

For details of our global editorial offices, customer services, and more information about Wiley products visit us at www.wiley.com.

Wiley also publishes its books in a variety of electronic formats and by print-on-demand. Some content that appears in standard print versions of this book may not be available in other formats.

Limit of Liability/Disclaimer of Warranty

While the publisher and authors have used their best efforts in preparing this work, they make no representations or warranties with respect to the accuracy or completeness of the contents of this work and specifically disclaim all warranties, including without limitation any implied warranties of merchantability or fitness for a particular purpose. No warranty may be created or extended by sales representatives, written sales materials or promotional statements for this work. The fact that an organization, website, or product is referred to in this work as a citation and/or potential source of further information does not mean that the publisher and authors endorse the information or services the organization, website, or product may provide or recommendations it may make. This work is sold with the understanding that the publisher is not engaged in rendering professional services. The advice and strategies contained herein may not be suitable for your situation. You should consult with a specialist where appropriate. Further, readers should be aware that websites listed in this work may have changed or disappeared between when this work was written and when it is read. Neither the publisher nor authors shall be liable for any loss of profit or any other commercial damages, including but not limited to special, incidental, consequential, or other damages.

Library of Congress Cataloging-in-Publication Data

Names: Coplan, Robert J., 1967– editor. | Bowker, Julie C., editor. | Nelson, Larry J., editor. | Wiley-Blackwell (Firm), publisher.
Title: The handbook of solitude : psychological perspectives on social isolation, social withdrawal, and being alone / edited by Robert J. Coplan, Julie C. Bowker, Larry J. Nelson.
Description: Second edition. | Hoboken, NJ : Wiley-Blackwell, 2021. | Includes bibliographical references and index.
Identifiers: LCCN 2021006669 (print) | LCCN 2021006670 (ebook) | ISBN 9781119576389 (hardback) | ISBN 9781119576426 (adobe pdf) | ISBN 9781119576853 (epub)
Subjects: LCSH: Solitude. | Social isolation. | Loneliness.
Classification: LCC BF637.S64 H36 2021 (print) | LCC BF637.S64 (ebook) | DDC 155.9/2–dc23
LC record available at <https://lcn.loc.gov/2021006669>
LC ebook record available at <https://lcn.loc.gov/2021006670>

Cover Design: Wiley

Cover Image: © kasayizgi / Getty Images

Set in 11/13pt Dante by Spi Global, Pondicherry, India

Contents

List of Contributors	vii
Part I Theoretical Perspectives	1
1 Alone Again: Revisiting Psychological Perspectives on Solitude <i>Robert J. Coplan, Julie C. Bowker, and Larry J. Nelson</i>	3
2 Evolutionary and Neuroscientific Perspectives on Adaptive Shyness <i>Raha Hassan, Taigan L. MacGowan, Kristie L. Poole, and Louis A. Schmidt</i>	16
3 An Attachment Perspective on Solitude and Loneliness <i>Mario Mikulincer, Phillip R. Shaver, and Inbal Gal</i>	31
4 What Does Animal (Nonhuman) Research Tell Us About Social Deprivation and Social Isolation? <i>Selin Zeytinoglu and Nathan A. Fox</i>	42
5 The Origins of Beneficial Solitude: Psychoanalytic Perspectives <i>Evangelia Galanaki</i>	58
6 Culture, Social Withdrawal, and Development <i>Xinyin Chen and Mengting Liu</i>	75
Part II Solitude Across the Life Span	89
7 Behavioral Inhibition and Psychopathology in Childhood <i>Emma E. Mumper and Daniel N. Klein</i>	91
8 Solitary Activities from Early Childhood to Adolescence: Causes, Content, and Consequences <i>Robert J. Coplan, Laura L. Ooi, and Will E. Hipson</i>	105
9 Manifestations of Solitude in Interpersonal Contexts and Negative Peer Experiences: Peer Rejection, Exclusion, and Victimization <i>Gary W. Ladd, Becky Kochenderfer-Ladd, Idean Ettekal, and Brandon N. Clifford</i>	117
10 Social Withdrawal During Adolescence: The Role of Peers <i>Julie C. Bowker, Hope I. White, and Rebecca G. Etkin</i>	133
11 Social Withdrawal During Emerging Adulthood <i>Larry J. Nelson and Mallory A. Millett</i>	146
12 Current and Future Paths in Research on Singlehood <i>Katarzyna Adamczyk</i>	163
13 Social Isolation, Loneliness, and Solitude in Older Adulthood <i>Christiane A. Hoppmann, Jennifer C. Lay, Theresa Pauly, and Elizabeth Zambrano</i>	178

Part III Understanding Solitude: Constructs, Processes, and Contexts	191
14 Social Approach and Avoidance Motivations <i>Jana Nikitin and Simone Schoch</i>	193
15 Ostracism and Solitude <i>Eric D. Wesselmann, Kipling D. Williams, Dongning Ren, and Andrew H. Hales</i>	209
16 The Possibilities of Aloneness and Solitude: Developing an Understanding Framed Through the Lens of Human Motivation and Needs <i>Thuy-vy T. Nguyen, Netta Weinstein, and Richard M. Ryan</i>	224
17 Getting Even Lonelier? Psychological Well-Being and Problematic Use of Media in the Over-Connected Society <i>Jung-Hyun Kim</i>	240
18 New Media and Solitude: Implications for Peer Relations <i>Kaitlyn Burnell, Madeleine J. George, and Marion K. Underwood</i>	254
19 Alone Versus Together: Finding the Right Balance for Creativity <i>Paul B. Paulus, Jared B. Kenworthy, and Laura R. Marusich</i>	268
20 Solitude as a Means to Obtaining Mental Rest in Skilled Athlete Populations <i>David W. Eccles, Alexander Kazmier, and Christopher Ehrhardt</i>	280
21 From Shyness to Social Anxiety: Understanding Solitude in the Context of Immigration <i>Yiyuan Xu, Charissa S.L. Cheah, Craig H. Hart, and You Jung Seo</i>	294
Part IV Solitude, Health, and Psychopathology	309
22 Introversion, Solitude, and Happiness <i>John M. Zelenski, Karin Sobocko, and Deanna C. Whelan</i>	311
23 Solitary and Social Aspects of Restoration in Nature <i>Kalevi Korpela and Henk Staats</i>	325
24 Intentional Solitude and Mindfulness: The Benefits of Being Alone <i>Chelom E. Leavitt, Bethany Butzer, Rebecca W. Clarke, and Kami Dvorakova</i>	340
25 Loneliness and Associated Mental Health Sequelae in Individuals with Autism Spectrum Disorder <i>Lauren Baczewski and Connie Kasari</i>	351
26 Social Anxiety Disorder and Emotional Solitude <i>Lynn E. Alden and Klint Fung</i>	364
27 Hikikomori: Risks and Consequences of Extreme Self-imposed Social Marginalization <i>Paul W.C. Wong and Tim M.H. Li</i>	378
28 Solitary Confinement Is Not “Solitude”: The Worst Case Scenario of Being “Alone” in Prison <i>Craig Haney</i>	390
Part V Magnum Opus	405
29 Social Withdrawal in Childhood: A Personal History of Theory and Research That Guided a Program of Developmental Research <i>Kenneth H. Rubin</i>	407
Index	448

List of Contributors

Katarzyna Adamczyk, Adam Mickiewicz University in Poznań, Poland
Lynn E. Alden, University of British Columbia, Canada
Lauren Baczewski, University of California, Los Angeles [UCLA], USA
Julie C. Bowker, University at Buffalo, The State University of New York, USA
Kaitlyn Burnell, Duke University, USA
Bethany Butzer, The University of New York in Prague, Czech Republic
Charissa S.L. Cheah, Department of Psychology University of Maryland, Baltimore County
Xinyin Chen, University of Pennsylvania, USA
Rebecca W. Clarke, Brigham Young University, USA
Brandon N. Clifford, Arizona State University, USA
Robert J. Coplan, Carleton University, Canada
Kami Dvorakova, Pennsylvania State University, USA
David W. Eccles, Florida State University, USA
Christopher Ehrhardt, Florida State University, USA
Rebecca G. Etkin, Yale University School of Medicine, USA
Idean Ettekal, Texas A & M University, USA
Nathan A. Fox, University of Maryland, USA
Klint Fung, University of British Columbia, Canada
Inbal Gal, Interdisciplinary Center Herzliya, Israel
Evangelia Galanaki, University of Athens, Greece
Madeleine J. George, RTI International, USA
Andrew H. Hales, University of Mississippi, USA
Craig Haney, University of California, Santa Cruz, USA
Craig H. Hart, School of Family Life Brigham Young University
Raha Hassan, McMaster University, Canada
Will E. Hipson, Carleton University, Canada
Christiane A. Hoppmann, University of British Columbia, Canada
Connie Kasari, University of California, Los Angeles [UCLA], USA
Alexander Kazmier, Independent Researcher
Jared B. Kenworthy, University of Texas at Arlington, USA
Kalevi Korpela, Tampere University, Finland
Jung-Hyun Kim, Sogang University, South Korea
Daniel N. Klein, Stony Brook University, USA
Becky Kochenderfer-Ladd, Arizona State University, USA
Gary W. Ladd, Arizona State University, USA
Jennifer C. Lay, Chinese University of Hong Kong, Hong Kong

- Chelom E. Leavitt**, Brigham Young University, USA
Tim M.H. Li, University of Hong Kong, Hong Kong
Mengting Liu, University of Pennsylvania, USA
Taigan L. MacGowan, McMaster University, Canada
Laura R. Marusich, U.S. Army Combat Capabilities Development Command, Army Research Laboratory, USA
Mario Mikulincer, Interdisciplinary Center Herzliya, Israel
Mallory A. Millett, Brigham Young University, USA
Emma E. Mumper, Stony Brook University, USA
Larry J. Nelson, Brigham Young University, USA
Thuy-vy T. Nguyen, University of Durham, UK
Jana Nikitin, University of Vienna, Austria
Laura L. Ooi, Carleton University, Canada
Kristie L. Poole, McMaster University, Canada
Paul B. Paulus, University of Texas at Arlington, USA
Theresa Pauly, University of British Columbia, Canada
Dongning Ren, Tilburg University, The Netherlands
Kenneth H. Rubin, University of Maryland, USA
Richard M. Ryan, Australian Catholic University, Australia
Louis A. Schmidt, McMaster University, Canada
Simone Schoch, Zurich University of Teacher Education, Switzerland
You Jung Seo, Department of Psychology University of Maryland, Baltimore County
Phillip R. Shaver, University of California Davis, USA
Karin Sobocko, Carleton University, Canada
Henk Staats, Universiteit Leiden, Netherlands
Marion K. Underwood, Purdue University, USA
Netta Weinstein, Cardiff University, UK
Eric D. Wesselmann, Illinois State University, USA
Deanna C. Whelan, Carleton University, Canada
Hope I. White, University at Buffalo, The State University of New York, USA
Kipling D. Williams, Purdue University, USA
Paul W.C. Wong, University of Hong Kong, Hong Kong
Yiyuan Xu, Department of Psychology University of Hawaii at Manoa
Elizabeth Zambrano, University of British Columbia, Canada
John M. Zelenski, Carleton University, Canada
Selin Zeytinoglu, University of Maryland, USA

Part I

Theoretical Perspectives

Alone Again: Revisiting Psychological Perspectives on Solitude

Robert J. Coplan¹, Julie C. Bowker², and Larry J. Nelson³

¹Carleton University, Canada

²University at Buffalo, The State University of New York, USA

³Brigham Young University, USA

Editors' Note: Solitude in the Time of COVID-19

Almost all the chapters for the second edition of the *Handbook of Solitude* were written before anyone had heard of COVID-19. The catastrophic implications of this global pandemic will be felt for years to come. Among the immediate effects of the lockdowns that were instituted in countries around the world to combat the spread of the virus, millions of individuals were thrust into unwanted solitude, or confined to home environments where, for various reasons, it was almost impossible to find a moment to spend alone. At the time of this writing, it is still not clear how long such conditions will continue. Never has it been more important to consider the causes and consequences of solitude for our well-being and mental health. We are hopeful that the new edition of this volume contributes a wide range of informed perspectives to these ongoing discussions.

Rob Coplan, Julie Bowker, and Larry Nelson

Alone Again: Revisiting Psychological Perspectives on Solitude

The experience of solitude is a ubiquitous phenomenon. Over the course of the life span, humans experience solitude for many different reasons and subjectively respond to solitude with a wide range of reactions and consequences. Some people may retreat to solitude as a respite from the stresses of life, for quiet contemplation, to foster creative impulses, or to commune with nature. Others may suffer the pain and loneliness of social isolation, withdrawing or being forcefully excluded from social interactions.

These exemplars illustrate the complex nature of solitude and its relation to well-being – and speak to what has been deemed the *paradox of solitude*. Indeed, theorists and researchers have highlighted several different paradoxical aspects of solitude over the years, including: (1) despite the widely held beliefs that solitude serves self-enhancing functions, it is often experienced as unwelcome and painful; (2) time alone can serve as both a reward (“me time”) and a punishment (time outs, solitary confinement); (3) solitude is viewed as both normative as well as a cause and consequence of psychopathology; (4) time alone can both interfere with and improve our relationships with others; and, as we will discuss in some detail herein; (5) solitude can simultaneously confer both costs and benefits for our well-being (Coplan et al., 2018; Galanaki, 2015; Merton, 1958; Larson, 1999).

It should also be noted that there is little consensus among researchers as to how solitude should be conceptualized, operationalized, and assessed. For example, some perspectives emphasize *physical* separation from others, although in some cases this becomes operationalized in varied ways. For example, participants might be required

simply to sit and think away from others (Wilson et al., 2014), whereas in other studies the focus is on activities while participants are physically alone (Leary et al., 2003). Of note, there is really no agreed-upon physical “distance” from others that is mandated in order for an individual to be considered alone. Other perspectives focus on *perceived* separation from others (Larson, 1990). In this regard, participants might report feeling alone and lonely even in the presence of others (van Roekel et al., 2015). Coplan and Bowker (2017) described this conceptual distinction as solitude representing a *state of mind* rather than a *state of being*. Finally, as we will discuss later, contemporary technology now makes it possible (and common) for us to be physically alone but in the *virtual* presence of – and interacting with – many others (Hollis et al., 2020).

These different conceptualizations of solitude highlight the many different “faces” of solitude. In 2014, the *Handbook of Solitude* was the first academic volume to specifically focus on the diverse theoretical and empirical approaches to the psychological study of solitude. Since that time, there has been considerable advancement in our understanding of solitude, with novel and exciting research focusing on previously unconsidered aspects of being alone. In this second edition of the *Handbook*, we are absolutely thrilled to present a blend of new and updated chapters that approach the study of solitude from a myriad of theoretical perspectives and methodological approaches, and with critically important applications for practice and policy.

In this introductory chapter, we revisit some of the critical historical components of the study of solitude, consider some of the novel issues that have emerged in recent years, and describe a broad theoretical model of the causes and consequences of solitude. We finish the chapter with an overview of the novel and updated contents of this new volume.

Looking Back: Solitude as Bad vs. Good

As noted above, there remain competing hypotheses regarding the nature of solitude and its implications for well-being. Indeed, these fundamentally opposed differential characterizations of solitude represent the most pervasive theme in the historical study of solitude as a psychological construct. From its early roots through to today, researchers have sought to depict and portray solitude as inherently “bad” versus “good.” As we will see, these attempts to singularly define the implications of solitude for well-being as an either/or dichotomy appear to represent an oversimplification of what has emerged as a much more complex phenomenon.

The notion that solitude has negative consequences has a long history and can literally be traced back to biblical times (Genesis 2:18, And the LORD God said “It is not good for the man to be alone”). For example, from an evolutionary perspective, solitude is maladaptive because social affiliations are essential to the survival of the human species, offering protection against predators, cooperative hunting, and food sharing (Barash, 1977; Hamilton, 1964; Trivers, 1971). Notwithstanding, many theorists and researchers have also long called attention to positive aspects of being alone (Middleton, 1935; Merton, 1958; Zimmerman, 1805; for a review, see Long & Averill, 2003). For example, over 300 years ago, Montaigne (1685) argued that individuals should strive for experiences of solitude not only as a respite from societal pressures, but also to free themselves from dogma, conventional ways of thinking, and the power of the group. This highlights two domains that have endured as consistently ascribed benefits to spending time alone, namely that solitude is an important and unique context for restoration (Staats & Hartig, 2004) and personal growth (Maslow, 1968).

Historical theoretical arguments regarding the costs and benefits of solitude have come from a wide range of psychological perspectives. For example, developmental psychologists have asserted that excessive solitude during childhood can cause psychological pain and suffering (Freud, 1930), damage critically important family relationships (Harlow, 1958), impede the development of the self-system (Mead, 1934), and prevent children from learning from their peers (Piaget, 1926). Yet, other developmentalists have espoused the notion that solitude provides a facilitating environment for psychological maturity, self-discovery, and self-realization, particularly during critical periods for development such as infancy/early childhood (Winnicott, 1958) and adolescence (Larson, 1990).

Social psychologists consider affiliation with others to be a basic human need (Horney, 1945; Shipley & Veroff, 1952), and the failure to meet this *need to belong* can have profoundly negative implications for well-being (Baumeister & Leary, 1995). Yet, social psychologists also argue that when solitude is *autonomously* motivated (i.e., derived from finding value or interest in the activity, Deci & Ryan, 2000), it is experienced more positively

and can serve as a context for self-regulation, stress reduction, and restoration (Berman et al., 2008; Leung, 2015; Nguyen et al., 2018).

From the perspective of clinical psychology, social isolation has been traditionally viewed as a target criterion for intervention (Lowenstein & Svendsen, 1938), and as a symptom of several psychological disorders (DSM-I; APA, 1952). Yet, it has also been suggested that creativity and artistic talents may develop in response to long periods of painful social isolation (Middleton, 1935; Storr, 1988; Thoreau, 1854).

Contemporary approaches to the psychology of solitude now acknowledge that time alone is neither inherently good nor bad, and that solitude has a very complex relationship with well-being (Coplan et al., 2018). In trying to decipher these complexities, researchers have started to focus on the different *causes* of solitude, and how those causes contribute to different *consequences* of being alone. As well, we are just beginning to understand how *contextual* factors might impact the pathways linking the causes and consequences of solitude. In this regard, these approaches ask how, for whom, and under what circumstances, do experiences of solitude differentially contribute to costs and benefits of well-being?

Looking Around: A Conceptual Model of the Causes and Consequences of Solitude

There is a myriad of factors that serve to mediate, moderate, and complicate how solitude impacts our well-being (Coplan et al., 2018). In Figure 1.1, we have attempted to synthesize these postulations into a broad conceptual model stipulating that: (1) there are different causal mechanisms that underlie our experiences of solitude; (2) these different “reasons” for spending time alone affect the implications of solitude for well-being; and (3) these processes are nested within contexts that serve to further modulate the nature of these associations.

First, it is important to distinguish between instances where individuals are spending time alone as a result of external processes, motivations to avoid others, or motivations to approach solitude. External processes impose solitude upon the individual. Under these circumstances, regardless of personal inclinations, experiences of ostracism, exclusion, rejection, and/or victimization result in social isolation (Rubin, 1982). Not surprisingly, this *unwanted* solitude has negative consequences, from mundane discomfort (e.g., boredom; Wilson et al., 2014) to painful loneliness (Cacioppo & Patrick, 2008), as well as contributing to declines in both mental (e.g., depression; Williams & Nida, 2011) and physical health (e.g., cardiovascular disease; Valtorta et al., 2018). Indeed, social isolation and loneliness are now considered to be risk factors for mortality (Holt-Lunstad et al., 2015).

In other cases, individuals may seek to remove themselves from opportunities for social interaction (and thus end up in solitude) as a means of avoiding social contexts perceived as stressful or unpleasant. This process has been referred to as *social withdrawal* (Rubin et al., 2009) and we construe it herein as solitude seeking motivated by the desire to avoid others. For example, from a motivational perspective, shyness has been conceptualized as arising from an approach-avoidance conflict (Asendorpf, 1990), whereby the wish to affiliate with others (high social approach motivation) is simultaneously inhibited by social fear and socio-evaluative concerns (Coplan et al., 2004). In this regard, although shy individuals’ solitude may be self-imposed, it is also predominantly unwelcome, and can lead to emotional distress, rumination, and anxiety (Nelson, 2013). Indeed, extreme shyness in children is now widely considered to be one of the most robust and consistent predictors of the development of clinical anxiety disorders (Clauss & Blackford, 2012).

In yet other cases, although it is widely accepted that the simple act of engaging in social interactions makes us happier (Epley & Schroeder, 2014), some individuals are higher in *social anhedonia*, reflecting a reduced capacity to derive pleasure from social interactions (Blanchard et al., 2000). This can lead to increased solitude because of feelings of sadness and lethargy (Coplan et al., 2015), and ultimately more serious personality and depressive disorders (Brown et al., 2007). As an aside, it is also important to note that *transactional* processes are likely occurring in terms of the interplay between the external process of social isolation and the internal motivation to avoid others (as depicted in Figure 1.1 via a dotted line with arrows on both ends). For example, withdrawing from opportunities for social interaction may invite ostracism from others, which in turn may heighten the desire to subsequently avoid social interaction, and so on... (Ren et al., 2015; Rubin & Mills, 1988).

These scenarios all share the commonality that individuals in these groups are engaging in solitude for reasons that are *reactive*. It is also important to consider individuals who are more *proactive* in their selection of

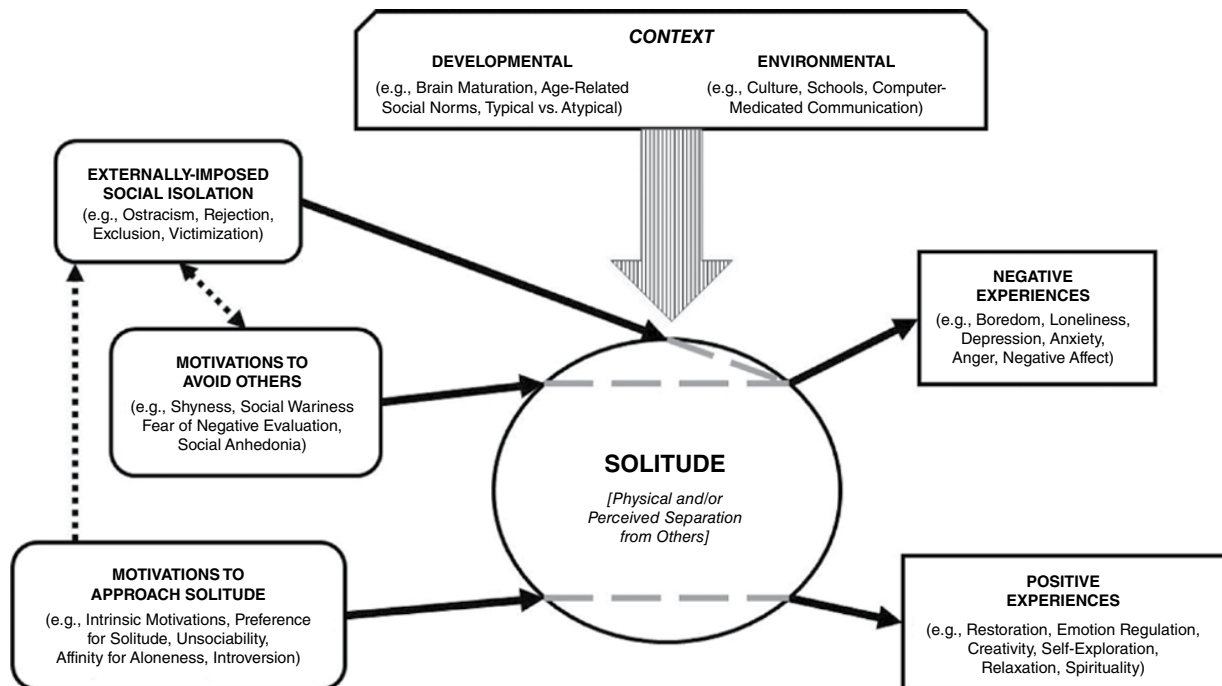


Figure 1.1 Theoretical Model of the Causes and Consequences of solitude.

solitude. In such instances, individuals are not retreating to solitude as a means of avoiding social interactions, but instead are *approaching* solitude as a desired and positive context. As mentioned previously, a key determining factor in how we experience solitude is whether it is sought out because of an intrinsic (i.e., autonomous, self-directed) motivation (Chua & Koestner, 2008). A number of related terms have been used to describe individual differences in the non-fearful desire for spending time alone, including *unsociability* (Coplan & Weeks, 2010), *social disinterest* (Coplan et al., 2004), *affinity for aloneness* (Goossens, 2014), *solitropic orientation* (Leary et al., 2003), and *preference for solitude* (Burger, 1995). An affinity for solitude is also a component of the broader personality dimension of *introversion-extraversion* (Eysenck & Eysenck, 1985).

Generally speaking, when solitude is chosen, spending time alone is viewed more positively and is associated with more positive outcomes, including self-regulation, stress reduction, and restoration (Berman et al., 2008; Leung, 2015; Nguyen et al., 2018). It has also been argued that spending time alone can foster self-growth (Long et al., 2003), spirituality (Hay & Morisey, 1978), and creativity (Csikszentmihalyi, 1996). However, it must also be noted that, regardless of the underlying reason, choosing to spend time alone can sometimes be viewed negatively by others and lead to rejection and ostracism (Coplan et al., 2013). Thus, even when affording benefits, spending time in solitude can sometimes also come at a cost.

As we have described, the different *causes* of solitude have clear implications for the potential *consequences* of spending time alone. However, in recent years, it has become increasingly clear that the nature of these associations is even more complicated than we thought. This is because *contextual* effects (e.g., developmental period, culture, technology) can also alter the magnitude – and even the direction – of the links between solitude and indices of well-being.

Looking Forward: Solitude in Context

Development. One contextual factor that has received considerable *theoretical* attention is developmental period (see Coplan, Ooi, et al., 2019, for a recent review). Indeed, researchers have long theorized that the risks associated with solitude might depend on the developmental period studied (e.g., early childhood versus middle childhood versus adolescence). In this regard, the costs of solitude are often assumed to be greater during

childhood relative to adolescence and adulthood – given the widely held notion that the young developing child requires a significant amount of positive peer interaction for healthy social, emotional, and social-cognitive development and well-being (Rubin et al., 2015). In addition, it is during adolescence that increasing needs for and enjoyment of privacy and solitude are thought to emerge (Larson, 1990). For this reason, it has been posited that some of the negative peer consequences often associated with social withdrawal during childhood, such as peer rejection and peer victimization, may diminish during the adolescent developmental period (Bowker et al., 2016).

However, it has also long been argued that the costs of childhood solitude may accumulate over time and that solitude at any age can foster loneliness and psychological angst, particularly if it is *externally* imposed. As mentioned previously, social needs are thought to exist in individuals of all ages, with several theories suggesting that psychological well-being is determined by whether social needs are satisfied. For example, Sullivan (1953) posited that all individuals have social needs, but that with development, the nature of the social needs change (e.g., during early adolescence, needs for intimacy emerge), as well as the *type* of relationship required to fulfill the needs (e.g., same-sex chumships or best friendships might satisfy needs for intimacy that emerge in early adolescence). Regardless of the developmental changes, however, Sullivan argued that if social needs were not fulfilled, significant negative self-system and psychological consequences would ensue. Consistent with these latter ideas are research findings that have identified loneliness, at any age, as one of the strongest risk factors for psychological ill-being (Erzen & Cikrikci, 2018). That said, there is some indication that effects of loneliness on psychological and physical health and well-being may be the greatest among the *oldest* adults, which again suggests that developmental period might matter.

Clearly the debate as to “when” in development solitude might carry the greatest costs is yet to be resolved. Indeed, theoretical speculations in this area have outpaced the empirical work. However, it must also be acknowledged that the very nature of solitary experiences likely change with age. For example, young children may retreat to their rooms, engage in solitary play in the company of peers, or find themselves forced to the periphery of social groups. Although externally imposed solitude might manifest similarly at older ages (e.g., adolescents being forced to hang out alone after school; adults being left out of work luncheons and gatherings), adolescents and adults have greater control over and increased opportunities for self-selected solitary experiences relative to children. For example, adolescents are sometimes left alone without parental supervision in their homes or are able to take themselves to places of their choosing. Adults can also choose to travel alone, engage in meditative and religious retreats, and can sometimes select relatively solitary occupations and ways to spend their free time. In contrast, there may come a time in the life of an older adult where they are significantly impeded in their ability to actively seek out social contacts. It remains to be seen how these potential differences in *agency* pertaining to solitude across the life span speak to the relation between solitude and well-being. Taken together, though, a thorough examination of the positive and negative faces of solitude must be undertaken with a developmental lens.

Culture. The more that we learn about the complex nature of solitude, the more we also come to realize that the meaning and impact of spending time alone must be considered within a broader *cultural* context. There is considerable variation across cultures in attitudes and beliefs regarding aspects of solitude (Buttrick et al., 2019). It is tempting to apply the notion of *goodness of fit* (Thomas & Chess, 1977) as a simple way to explain differences in the meaning and implications of solitude across societies and cultures. That is, if solitude is generally valued or even encouraged within a given culture, then the choice to spend time alone might be relatively adaptive, and thus, associated with more positive outcomes because it matches or is consistent with cultural values and norms. However, and perhaps not surprisingly given the complex and multidimensional nature of solitude, it appears that the impacts of culture on the causes and consequences of solitude are extremely complex and nuanced.

For example, there is some evidence to suggest that extraversion is more strongly predictive of well-being in Western cultures (particularly North America) than in non-Western cultures, because of the high value placed on being outgoing and sociable in these societies (Kim et al., 2016). Similarly, shyness more strongly predicts indices of negative life quality in Western as compared to East Asian cultures (Rapee et al., 2011). As well, because of

the value placed on sociability in the West, children who play alone in the presence of peers (e.g., at preschool or in the schoolyard) tend to evoke negative responses from their classmates (Coplan et al., 2013; Hart et al., 2000).

Yet, Western cultures are thought to also value independence and self-reliance (Marjoribanks, 1994). In this regard, the personal choice to spend time alone appears to be acknowledged as a normative belief in such societies (Bowker et al., 2020), and in and of itself, a non-fearful preference for solitude is relatively accepted by others (Nelson, 2013). However, in other cultures (e.g., China) that value devotion to interdependence and the collective (e.g., peer group) over the individual, the decision to remove oneself from the collective (for any reason) may be viewed as selfish and deviant (Chen, 2019), and responded to quite negatively (Liu et al., 2015; Liu et al., 2017; Nelson et al., 2012). But, it has also been argued that East Asian cultures place greater value and are more likely to encourage humble and socially unassertive behaviors, because they maintain group harmony and promote collectivistic values (Schreier et al., 2010; Xu et al., 2007). Finally, it should be noted that not all Western cultures view sociability in the same way. For example, Finish culture places a high value on quietness and the ability to be “comfortable in silence” (Berry et al., 2004, p. 270).

These are just a few examples of the complexities involved in considering aspects of solitude across cultures. It is only in understanding the cultural context for *why* a solitary behavior may be seen as adaptive or problematic that we begin to see the situation clearly and accurately. Thus, we need to be cautious about broadly categorizing certain forms of solitude as either “good” or “bad” when, instead, it is really only by understanding the cultural context within which the solitary behavior is enacted that we that we can begin to understand *why* the behavior may be perceived positively or negatively, and more importantly, how it may lead to positive or negative outcomes in the lives of individuals.

Technology and social media. Finally, beyond culture, there is another context that is reshaping how we think about solitude. Today, people’s social interactions are not limited to face-to-face encounters or to speaking on the telephone. Instead, technological advances have made computer-mediated communication not only possible but prevalent in our daily lives. Indeed, Facebook, Instagram, Snapchat, Tic Toc, FaceTime, Skype, text messaging, and numerous other platforms for computer-mediated communication had become part of the everyday world that has expanded the way we interact on a daily basis.

As a result of this, it is absolutely essential that we examine what solitude *means* in this digital context. For example, there is no real consensus about at what point increasingly interactive technologies would render someone as no longer “alone” (i.e., scrolling through social media feeds vs. commenting and responding to posts vs. exchanging texts in real time vs. direct audio communication vs. direct audio-visual communication). Indeed, for decades, scholars have examined individual differences in tendencies (both motivations and actual behaviors) to move toward or away from interactions in social settings. Now, the digital world in which we live demands that we expand our research to examine the meaning and impact of moving toward or away from social interaction in technologically mediated contexts.

Emerging work is already pointing to individual differences in, among other things, the use of connective forms of media (forms of media that have the *potential* to connect individuals to others such as e-mail; Nelson et al., 2016), the extent of interaction that occurs when using digital forms of communication (e.g., how people interact on social media; Scott et al., 2018), and the role of technology in maintaining relationships (e.g., use and content of text messages between friends and romantic partners; e.g., Rideout & Robb, 2018). Just as we can identify meaning and outcomes associated with withdrawing from in-person settings, we are starting to see that there is meaning and impact to be found in what it means to engage in solitude in the context of a digitally connected world. For example, emerging work is showing that individual differences in whether and how (i.e., competently or not) a person engages in computer-based interactions can be linked to indices of adjustment and maladjustment (e.g., empathy, loneliness, self-esteem, prosocial behaviors, aggression; Brody, 2018; Kim & Lee, 2011; Lapierre, 2020; Nelson et al., 2016). Taken together, it is impossible to approach a volume devoted to understanding the meaning and impact of solitude in contexts without examining it in the digital age in which we now live.

Overview of the New Edition of this Handbook

The chapters in this second edition of the *Handbook of Solitude* provide the reader with a mix of updated perspectives and research on topics covered in the first handbook, as well as all new chapters examining original topics related to solitude. Although we have expanded our coverage of important topics related to solitude, we still examine solitude from multiple psychological perspectives, during different developmental periods across the life span, and across a broad range of contexts. Moreover, the contributing authors represent a “who’s who” of international experts in their related areas.

The first section of this volume focuses on theoretical approaches to understanding various aspects of solitude. The section provides a balance of perspectives that, in some chapters, examine the adaptive and beneficial aspects of solitude, with other chapters that employ a lens revealing the potentially problematic aspects of solitude. To begin, Hassan, MacGowan, Poole, and Schmidt (Chapter 2) explore the possible adaptive function of shyness from evolutionary and neuroscientific perspectives. From a very different lens, Mikulincer, Shaver, and Gal (Chapter 3) describe the contribution of attachment theory to our understanding of loneliness in the face of solitude. In having these two chapters open the book, the reader is immediately challenged to think about both positive and negative aspects of solitude and, at the same time, the role of both biology and the environment (e.g., the family) in understanding the display of solitude, its meaning, and its impact. In their chapter, Zeytinoglu and Fox (Chapter 4) examine the effects of social deprivation and social isolation on developmental outcomes by demonstrating how work with animals (nonhuman) provide important models to understand the potential effects of deprivations in social experiences. Then, Galanaki (Chapter 5) returns the reader to a perspective that examines the benefits of solitude as she provides psychoanalytic perspectives of the solitary self, including the ability to be alone, the necessity of being alone, as well as the companionable nature of solitude. The section concludes with Chen and Liu (Chapter 6) providing a chapter that lays a foundation for the importance of considering culture as a context for solitude as they examine culture, social withdrawal, and development. Taken together, this opening section lays the conceptual framework for the rest of the book by underscoring that an examination of the good and the bad of solitude must consider the role of biology, the influence of factors in the immediate environment (e.g., family, peers), and the effect of the broader context (culture) in which solitude occurs.

The second section of the book is organized to present the study of solitude in different developmental stages across the life span spanning the years from early childhood to older adulthood. However, equally represented here is heterogeneous nature of solitude, with various different conceptualizations, types, and psychological processes related to solitude represented. Mumper and Klein (Chapter 7) examine the construct of temperament known as behavioral inhibition (the tendency to exhibit fearful/withdrawn behavior in response to unfamiliar people and novel contexts), including the genetic, biological, cognitive, and environmental risk factors associated with its development, maintenance, and links with psychopathology. Coplan, Ooi, and Hipson (Chapter 8) then explore the causes and consequences of different solitary activities in a variety of contexts (school and nonschool settings) from early childhood to adolescence. Whereas Coplan and colleagues address, among other things, aspects of solitude that youth choose to engage in, Ladd and colleagues (Chapter 9) continue the discussion of solitude in interpersonal contexts but focus on aspects of solitude that children and adolescents rarely choose. Specifically, the chapter shines light on the negative aspects of peer experiences that include rejection, exclusion, and victimization. Continuing with an emphasis on the role of experiences with peers, Bowker, White, and Etkin (Chapter 10) focus their lens specifically on the period of adolescence as they examine social withdrawal and experiences at both the *group* (e.g., rejection, exclusion) and *dyadic* (e.g., friendships) levels of social complexity.

Developmentally, the end of adolescence marks a change in the level of structure (e.g., oversight by adults including parents, teachers, and coaches). Given that emerging adults can now choose for themselves how much time to spend with others or in solitude, Nelson and Millett (Chapter 11) discuss how motivations to withdraw from social interactions may be tied, in positive and negative ways, to development during the transition to adulthood. For an increasing number of people, this path toward and into adulthood is made as a single (e.g., not married) individual. Adamczyk (Chapter 12) provides insight into what we know about singlehood in adulthood including the multitude of reasons for singlehood and the links between singlehood and aspects of adjustment and maladjustment. Finally, our developmental coverage of withdrawal across the life

span concludes with a look by Hoppman and colleagues (Chapter 13) into solitude experienced by individuals in older adulthood.

The third section of the handbook is aimed at unpacking the complexity that is solitude. The section attempts to showcase the number of different ways to think about aspects of solitude, including different constructs, processes, and contexts, that when combined increase our understanding of the broader concept of solitude. To begin the section, Nikitin and Schoch (Chapter 14) employ the lens of social approach motivations (dispositional motivation to approach positive social outcomes), and social avoidance motivations (the dispositional motivation to avoid negative social outcomes) to explain why some individuals are better able to establish and maintain satisfying social relationships than others. That is followed by Wesselmann and colleagues' (Chapter 15) treatment of the painful experience of ostracism including the various affective, cognitive, and behavioral reactions to being ignored and excluded. Next, Nguyen, Weistein, and Ryan (Chapter 16) explore some of the myriad of factors that serve to shape solitary experiences, including the reasons for which we find ourselves alone, the implications of different solitary activities, and the characteristics of solitude that make it feel more true and authentic to the individual. This chapter also highlights the importance of autonomous (intrinsic) motivations in the positive experience and impact of solitude.

The next two chapters address a unique context for solitude. As noted previously, the media-saturated world in which we now live is providing a context that is reshaping how we think about solitude. In exploring the darker side, as it were, of media, Kim (Chapter 17) examines the bidirectional links between problematic use of media and psychological maladjustment with an emphasis on loneliness. Burnell, George, and Underwood (Chapter 18) then highlight how new media has the potential to connect us to others as well as to isolate us from others by focusing on social networking sites and mobile phones and their relation to young people's social adjustment and maladjustment. Continuing with the notion that solitude has both the potential for good and bad, Paulus, Kenworthy, and Marusich (Chapter 19) explicate how finding the right balance between being alone and being together can promote creativity, and Eccles, Kazmier, and Ehrhart (Chapter 20) look into the world of highly skilled athletes to show how solitude can be a means of rest that has benefits in sport performance and well-being. The section then concludes by reminding us once again that context matters in our understanding of solitude. Xu and colleagues (Chapter 21) make it poignantly clear that solitude may be experienced uniquely for immigrants who have to constantly deal with the negative biases and stereotypes associated with foreign languages and accents, experiences of acculturation, perpetual foreigner stereotypes, and intergroup anxiety between immigrant and non-immigrant groups. Taken together, this section provides a clear reminder that to understand solitude's meaning and impact, we must consider a variety of constructs (e.g., motivations, needs, ostracism), contexts (e.g., peer group, media, sports), and outcomes (e.g., creativity, loneliness, rest, anxiety) related to solitude.

The fourth section of the book focuses on the strong, and oftentimes complicated links between solitude and mental health. Although several chapters in the earlier sections describe findings pertaining to solitude and psychological outcomes, the chapters in this section are unique in their special emphasis not only on individual characteristics (including specific psycho-social difficulties), but also on contexts that can influence when solitude leads to mental health difficulties and psychopathology or confer benefits. In the first chapter in this section, Zelenski, Sobocko, and Whelan (Chapter 22) explore commonly held beliefs about the links between *introversion*, *extraversion*, and happiness. Korpela and Staats (Chapter 23) describe the ways in which time spent in nature can be restorative for mental health and well-being. Leavitt, Butzer, Clarke, and Dvorakova (Chapter 24) provide a detailed discussion about the importance of solitude during the increasingly popular and therapeutic practice of mindfulness meditation. The next two chapters return to a consideration of timely and important individual characteristics related to solitude, with a focus on *autism* by Baczewski and Kasari (Chapter 25) and *social anxiety disorder* by Alden and Fung (Chapter 26). The remaining chapters in this section focus on unique contexts that profoundly impact, for better or worse, experiences of solitude and aloneness and their associations with mental health. Wong and Li (Chapter 27) offer in-depth cultural analysis of *hikikomori*, a phenomenon first discovered in Japan wherein individuals retreat into solitude in their residences for six months or longer, with an emphasis on a novel intervention effort in Hong Kong. In the final chapter in this section, Haney (Chapter 28) examines the unique context of solitary confinement within the United States' prison system, with a fascinating discussion of the ways in different aspects of context (the larger prison system,

the nature of solitary confinement) come together to lead to considerable suffering and psychopathology in an already vulnerable population of inmates. Taken together, the chapters highlight the important contributions of both the individual and the context for research and clinical intervention and prevention efforts.

In the final chapter of the book, we are extremely pleased to include a unique and personal historical perspective on the genesis of a central research area related to solitude. In this chapter, Kenneth Rubin (Chapter 29) describes the development of his innovative and highly influential research program on social withdrawal during childhood. This seminal work began in the 1970s with the novel notion that if children and adolescent benefit from social interactions, relationships, and group involvement, youth who fail to interact with peers might struggle considerably across numerous domains. This initial idea proved to be correct, and as a result, led to the creation of a brand-new area of research, *childhood social withdrawal*, of which Rubin is widely regarded as a founder. The three editors of this handbook were all fortunate to work with Ken as his graduate students, an experience for which we are eternally grateful. Thus, it is fitting that we conclude this handbook with his deeply personal account of his research career as it not only influenced our research careers but also the research careers of many of the authors in this book and those who will be reading this handbook as graduate students or senior academics.

Concluding Thoughts: Getting Solitude “Just Right”

As we have seen, we still have much to learn about the nature of the complex links between solitude and well-being. Moving forward, we would assert that we should aim for *balance* in this discussion. That is, solitude is not a *size fit all* phenomenon – and as a result – we should be careful how we advocate its implementation. As an example of how to think about the implementation of such a complex construct, Coplan, Zelenski, and Bowker (2018) likened the effects of solitude on well-being to spending time in direct *sunlight*. In this regard, experiencing at least some sunlight on a regular basis is probably good for all of us (e.g., source of vitamin D), but also particularly important for some of us (e.g., those with Seasonal Affective Disorder). However, the optimal time that we spend in the sun differs across individuals (e.g., some people get sunburned more easily than others), and chronic overexposure puts all of us at increased risk for negative consequences (e.g., melanoma).

Importantly, this suggests that there are potentially negative implications for both getting too much solitude – but also – and importantly – for not getting enough solitude (Coplan, Hipson et al., 2019). Ultimately, it appears that our experiences of solitude may be subject to the *Goldilocks Hypothesis*. As it applied to bowls of chairs, porridge, and beds, the Goldilocks Hypothesis asserts that there is an optimal amount (“just right”) of exposure to certain circumstances or experiences for positive effects to occur that is specific to each individual (e.g., Coplan et al., 2019; Kagan, 1990; Kidd et al., 2014; Przybylski & Weinstein, 2017). Accordingly, the chapters in this handbook have helped shed light on the biological, environmental (e.g., family, peers), and contextual (e.g., culture) factors that contribute to what determines the amount and type of solitude that is “just right” for any individual.

Indeed, we would like to thank the contributing authors for their thought-provoking and insightful chapters. We hope that the content of the volume will be of benefit to readers who are trying to utilize the potential benefits in their own lives. Also, we are hopeful that the chapters will further stimulate research related to our understanding of the causes and consequences of solitude.

References

- American Psychiatric Association. (1952). *Diagnostic and Statistical Manual of Mental Disorders* (1st edition). Washington, DC.
- Asendorpf, J.B. (1990). Beyond social withdrawal: shyness, unsociability, and peer avoidance. *Human Development*, 33, 250–259.
- Barash, D.P. (1977). *Sociobiology and Behavior*. New York: Elsevier.
- Baumeister, R.F. & Leary, M.R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497–529.

- Berman, M.G., Jonides, J., & Kaplan, S. (2008). The cognitive benefits of interacting with nature. *Psychological Science, 19*, 1207–1212.
- Berry, M., Carbaugh, D., & Nurmikari-Berry, M. (2004). Communicating Finnish quietude: a pedagogical process for discovering implicit cultural meanings in languages. *Language and Intercultural Communication, 4*, 209–228.
- Blanchard, J.J., Gangestad, S.W., Brown, S.A., & Horan, W.P. (2000). Hedonic capacity and schizotypy revisited: a taxometric analysis of social anhedonia. *Journal of Abnormal Psychology, 109*, 87–95.
- Bowker, J.C., Ooi, L.L., Coplan, R.J., & Etkin, R.G. (2020). When is it okay to be alone? Gender differences in normative beliefs about social withdrawal. *Sex Roles, 82*, 482–492.
- Bowker, J.C., Rubin, K.H., & Coplan, R.J. (2016). Social withdrawal. In R.J.R. Levesque (Ed.), *Encyclopedia of Adolescence* (2nd ed., pp. 1–14). New York: Springer.
- Brody, N. (2018). Opting out of social media: online communication attitudes mediate the relationship between personality factors and Facebook non-use. *Southern Communication Journal, 83*(2), 75–88. <https://doi.org/10.1080/1041794X.2017.1413415>
- Brown, L.H., Silvia, P.J., Myin-Germeys, I., & Kwapil, T.R. (2007). When the need to belong goes wrong: the expression of social anhedonia and social anxiety in daily life. *Psychological Science, 18*, 778–782.
- Burger, J.M. (1995). Individual differences in preference for solitude. *Journal of Research in Personality, 29*, 85–108.
- Buttrick, N., Choi, H., Wilson, T.D., Oishi, S., Boker, S.M., Gilbert, D.T., Alper, S., Aveyard, M., Cheong, W., Čolić, M.V., Dalgat, I., Doğulu, C., Karabati, S., Kim, E., Knežević, G., Komiya, A., Laclé, C.O., Ambrosio Lage, C., Lazarević, L.B., ... Wilks, D.C. (2019). Cross-cultural consistency and relativity in the enjoyment of thinking versus doing. *Journal of Personality and Social Psychology, 117*, e71–e83.
- Cacioppo, J.T. & Patrick, B. (2008). *Loneliness: Human Nature and the Need for Social Connection*. New York: W.W. Norton & Company.
- Chua, S.N. & Koestner, R. (2008). A self-determination theory perspective on the role of autonomy in solitary behavior. *The Journal of Social Psychology, 148*, 645–648.
- Chen, X. (2019). Culture and shyness in childhood and adolescence. *New Ideas in Psychology, 53*, 58–66.
- Clauss, J.A. & Blackford, J.U. (2012). Behavioral inhibition and risk for developing social anxiety disorder: a meta-analytic study. *Journal of the American Academy of Child & Adolescent Psychiatry, 51*, 1066–1075.
- Coplan, R.J. & Bowker, J.C. (2014). *The Handbook of Solitude: Psychological Perspectives on Social Isolation, Social Withdrawal, and Being Alone*. New York: Wiley-Blackwell.
- Coplan, R.J. & Bowker, J. (2017). Should we be left alone? Psychological perspectives on the implications of seeking solitude. In I. Bergmann & S. Hippler (Eds.), *Cultures of Solitude: Loneliness–Limitation–Liberation* (pp. 287–302). Bern: Peter Lang.
- Coplan, R.J., Hipson, W.E., Archbell, K., Ooi, L.L., Baldwin, D., & Bowker, J.C. (2019). Seeking more solitude: conceptualization, assessment, and implications of aloneliness. *Personality and Individual Differences, 148*, 17–26.
- Coplan, R.J., Ooi, L.L., & Baldwin, D. (2019). Does it matter when we want to be alone? Exploring developmental timing effects in the implications of unsociability. *New Ideas in Psychology, 53*, 47–57.
- Coplan, R.J., Ooi, L.L., & Nocita, G. (2015). When one is company and two is a crowd: why some children prefer solitude. *Child Development Perspectives, 9*, 133–137.
- Coplan, R.J., Zelenski, J., & Bowker, J.C. (2018). Well enough alone? The costs and benefits of solitude. In J.E. Maddux (Ed.), *Subjective Well-Being and Life Satisfaction* (pp. 129–147). New York: Routledge.
- Coplan, R.J., Prakash, K., O'Neil, K., & Armer, M. (2004). Do you "want" to play? Distinguishing between conflicted shyness and social disinterest in early childhood. *Developmental Psychology, 40*, 244–258.
- Coplan, R.J., Rose-Krasnor, L., Weeks, M., Kingsbury, A., Kingsbury, M., & Bullock, A. (2013). Alone is a crowd: social motivations, social withdrawal, and socio-emotional functioning in later childhood. *Developmental Psychology, 49*, 861–875.
- Coplan, R.J. & Weeks, M. (2010). Unsociability in middle childhood: conceptualization, assessment, and associations with socio-emotional functioning. *Merrill-Palmer Quarterly, 56*, 105–130.
- Csikszentmihalyi, M. (1996) *Creativity: Flow and the Psychology of Discovery and Invention*. New York: Harper Collins.
- Deci, E.L. & Ryan, R.M. (2000). The "what" and the "why" of goal pursuits: human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227–268.
- Epley, N. & Schroeder, J. (2014). Mistakenly seeking solitude. *Journal of Experimental Psychology: General, 143*, 1980–1999.
- Eysenck, H.J. & Eysenck, M.W. (1985). *Personality and Individual Differences: A Natural Science Approach*. New York: Plenum Press.

- Erzen, E. & Çikrikci, Ö. (2018). The effect of loneliness on depression: a meta-analysis. *International Journal of Social Psychiatry*, 64, 427–435.
- Freud, S. (1930/1961). Civilization and its discontents. In J. Strachey (Ed. and Trans.), *The Standard Edition of the Complete Psychological Works of Sigmund Freud* (Vol. 21, pp. 57–145). London: Hogarth Press. (Original work published 1930)
- Galanaki, E.P. (2015). Solitude as a state of positive aloneness in childhood and adolescence. In C.J. Kowalski, J.P. Cangemi, & A. Rokach (Eds.), *Loneliness in Life: Education, Business, and Society*. (pp. 168–190). Dubuque, IA: McGraw Hill.
- Goossens, L. (2014). Affinity for aloneness and preference for solitude in childhood: linking two research traditions. In R.J. Coplan, & J.C. Bowker (Eds.), *The Handbook of Solitude: Psychological Perspectives on Social Isolation, Social Withdrawal, and Being Alone* (pp. 150–166). New York: Wiley-Blackwell.
- Hamilton, W.D. (1964). The evolution of social behaviour II. *Journal of Theoretical Biology*, 7, 17–52.
- Harlow, H., (1958). The nature of love. *American Psychologist*, 13, 573–685.
- Hart, C.H., Yang, C., Nelson, N.J., Robinson, C.C., Olsen, J.A., Nelson, D.A., Porter, C.L., Jin, S., Olsen, S.F., & Wu, P. (2000). Peer acceptance in early childhood and subtypes of socially withdrawn behavior in China, Russia and the United States. *International Journal of Behavioral Development*, 24, 73–81.
- Hay, D. & Morisey, A. (1978). Reports of ecstatic, paranormal, or religious experience in Great Britain and the United States – a comparison of trends. *Journal for the Scientific Study of Religion*, 17, 255–268.
- Hollis, C., Livingstone, S., & Sonuga-Barke, E. (2020). Editorial: The role of digital technology in children and young people's mental health – a triple-edged sword? *Journal of Child Psychology and Psychiatry*, 61, 837–841.
- Holt-Lunstad, J., Smith, T.B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality a meta-analytic review. *Perspectives on Psychological Science*, 10, 227–237.
- Horney, K. (1945). *Our Inner Conflicts: A Constructive Theory of Neurosis*. New York: Norton.
- Kagan, D.M. (1990). Ways of evaluating teaching cognition: inferences concerning the Goldilocks Principle. *Review of Educational Research*, 60, 419–469.
- Kidd, C., Piantadosi, S.T., & Aslin, R.N. (2014). The Goldilocks Effect in infant auditory attention. *Child Development*, 85, 1795–1804.
- Kim, H., Schimmack, U., Oishi, S., & Tsutsui, Y. (2018). Extraversion and life satisfaction: a cross-cultural examination of student and nationally representative samples. *Journal of Personality*, 86, 604–618.
- Kim, J-H. & Lee, J.R. (2011). The Facebook paths to happiness: effects of the number of Facebook friends and self-presentation on subjective well-being. *Cyberpsychology, Behavior, and Social Networking*, 14(6), 359–364.
- Lapierre, M.A. (2020). Smartphones and loneliness in love: testing links between smartphone engagement, loneliness, and relational health. *Psychology of Popular Media*, 9, 125–134.
- Larson, R.W. (1990). The solitary side of life: an examination of the time people spend alone from childhood to old age. *Developmental Review*, 10, 155–183.
- Larson, R.W. (1999). The uses of loneliness in adolescence. In K.J. Rotenberg, & S. Hymel (Eds.), *Loneliness in Childhood and Adolescence* (pp. 244–262). New York: Cambridge University Press.
- Leary, M.R., Herbst, K.C., & McCrary, F. (2001). Finding pleasure in solitary activities: desire for aloneness or disinterest in social contact? *Personality and Individual Differences*, 35, 59–68.
- Leary, M.R., Herbst, K.C., & McCrary, F. (2003). Finding pleasure in solitary activities: desire for aloneness or disinterest in social contact? *Personality and Individual Differences*, 35, 59–68.
- Leung, L. (2015). Using tablet in solitude for stress reduction: an examination of desire for aloneness, leisure boredom, tablet activities, and location of use. *Computers in Human Behavior*, 48, 382–391.
- Liu, J., Chen, X., Coplan, R.J., Ding, X., Zaratany, L., & Ellis, W. (2015). Shyness and unsociability and their relations with adjustment in Chinese and Canadian children. *Journal of Cross-Cultural Psychology*, 46, 371–386.
- Liu, J., Chen, X., Zhou, Y., Li, D., Fu, R., & Coplan, R.J. (2017). Relations of shyness-sensitivity and unsociability with adjustment in middle childhood and early adolescence in suburban Chinese children. *International Journal of Behavioral Development*, 4, 681–687.
- Long, C.R. & Averill, J.R. (2003). Solitude: an exploration of benefits of being alone. *Journal for the Theory of Social Behavior*, 33, 21–44.
- Long, C.R., Seburn, M., Averill, J.R., & More, T.A. (2003). Solitude experiences: varieties, settings, and individual differences. *Personality and Social Psychology Bulletin*, 29, 578–583.
- Lowenstein, P. & Svendsen, M. (1938). Experimental modification of the behavior of a selected group of shy and withdrawn children. *American Journal of Orthopsychiatry*, 8, 639–654.

- Marjoribanks, K. (1994). Cross-cultural comparisons of family environments of Anglo-, Greek-, and Italian-Australians. *Psychological Reports, 74*, 49–50.
- Maslow, A.H. (1968). *Toward a Psychology of Being*. New York: Van Nostrand.
- Mead, G.H. (1934). *Mind, Self, and Society*. Chicago: University of Chicago Press.
- Merton, T. (1958). *Thoughts in Solitude*. New York: Farrar, Straus, and Giroux.
- Middleton, W.C. (1935). The propensity of genius to solitude. *The Journal of Abnormal and Social Psychology, 30*(3), 325–332.
- Montaigne, M. (1965). Of solitude. In D.M. Frame (Trans.), *The Complete Essays of Michel de Montaigne* (pp. 174–183). Stanford, CA: Stanford University Press.
- Nelson, L.J. (2013). Going it alone: comparing subtypes of withdrawal on indices of adjustment and maladjustment in emerging adulthood. *Social Development, 22*, 522–538.
- Nelson, L.J., Coyne, S.M., Howard, E., & Clifford, B.N. (2016). Withdrawing to a virtual world: associations between subtypes of withdrawal, media use, and maladjustment in emerging adults. *Developmental Psychology, 52*(6), 933–942.
- Nelson, L.J., Hart, C.H., Yang, C., Wu, P., & Jin, S. (2012). An examination of the behavioral correlates of subtypes of nonsocial play among Chinese preschoolers. *Merrill-Palmer Quarterly, 58*, 77–108.
- Nguyen, T.T., Ryan, R.M., & Deci, E.L. (2018). Solitude as an approach to affective self-regulation. *Personality and Social Psychology Bulletin, 44*, 92–106.
- Piaget, J. (1926). *The Language and Thought of the Child*. London: Routledge & Kegan Paul.
- Przybylski, A.K. & Weinstein, N. (2017). A large-scale test of the Goldilocks Hypothesis: quantifying the relations between digital-screen use and the mental well-being of adolescents. *Psychological Science, 28*, 204–215.
- Rapee, R.M., Kim, J., Wang, J., Liu, X., Hofmann, S.G., Chen, J., Oh, K.Y., Bögels, S.M., Arman, S., Heinrichs, N., & Alden, L. E. (2011). Perceived impact of socially anxious behaviors on individuals' lives in Western and East Asian countries. *Behavior Therapy, 42*, 485–492.
- Ren, D., Wesselmann, E., & Williams, K.D. (2016). Evidence for another response to ostracism: solitude seeking. *Social Psychological and Personality Science, 7*(3), 204–212.
- Rideout, V. & Robb, M.B. (2018). *Social Media, Social Life: Teens Reveal Their Experiences*. Common Sense Media. San Francisco: CA: Common Sense Media.
- Rubin, K.H. (1982). Non-social play in preschoolers: necessary evil? *Child Development, 53*, 651–657.
- Rubin, K.H., Bukowski, W.M., & Bowker, J.C. (2015). Children in peer groups. In R.M. Lerner (Series Ed.), M.H. Bornstein, & T. Leventhal (Vol. Eds.), *Handbook of Child Psychology and Developmental Science, Vol. 4: Ecological Settings and Processes in Developmental Systems* (7th ed., pp. 175–222). New York: Wiley-Blackwell.
- Rubin, K.H., Coplan, R.J., & Bowker, J.C. (2009). Social withdrawal in childhood. *The Annual Review of Psychology, 60*, 141–171.
- Rubin, K.H. & Mills, R.S. (1988). The many faces of social isolation in childhood. *Journal of Consulting and Clinical Psychology, 56*, 916–924.
- Scott, G.G., Boyle, E.A., Czerniawska, K., & Courtney, A. (2018). Posting photos on Facebook: the impact of narcissism, social anxiety, loneliness, and shyness. *Personality and Individual Differences, 133*, 67–72. <https://doi.org/10.1016/j.paid.2016.12.039>
- Shipley, T.E. & Veroff, J.A. (1952). A projective measure of need for affiliation. *Journal of Experimental Psychology, 43*, 349–356.
- Schreier, S.S., Heinrichs, N., Alden, L., Rapee, R.M., Hofmann, S.G., Chen, J., & Bögels, S. (2010). Social anxiety and social norms in individualistic and collectivistic countries. *Depression and Anxiety, 27*, 1128–1134.
- Staats, H. & Hartig, T. (2004). Alone or with a friend: a social context for psychological restoration and environmental preferences. *Journal of Environmental Psychology, 24*, 199–211.
- Storr, A. (1988). *Solitude: A Return to the Self*. New York: Free Press.
- Sullivan, H.S. (1953). *The Interpersonal Theory of Psychiatry*. New York: W.W. Norton & Co.
- Thomas, A. & Chess, S. (1977). *Temperament and Development*. Brunner/Mazel.
- Thoreau, H.D. (1854). *Walden; or, Life in the Woods*. Boston: Ticknor & Fields.
- Trivers, R. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology, 46*, 35–57.
- Valtorta, N.K., Kanaan, M., Gilbody, S., & Hanratty, B. (2018). Loneliness, social isolation and risk of cardiovascular disease in the English Longitudinal Study of Ageing. *European Journal of Preventive Cardiology, 25*, 1387–1396.
- Van Roekel, E., Scholte, R., Engels, R., Goossens, L., & Verhagen, M. (2015). Loneliness in the daily lives of adolescents: an experience sampling study examining the effects of social contexts. *Journal of Early Adolescence, 35*, 905–930.

- Williams, K.D. & Nida, S.A. (2011). Ostracism: consequences and coping. *Current Directions in Psychological Science*, 20, 71–75.
- Wilson, T.D., Reinhard, D.A., Westgate, E.C., Gilbert, D.T., Ellerbeck, N., Hahn, C., ... & Shaked, A. (2014). Just think: the challenges of the disengaged mind. *Science*, 345, 75–77.
- Winnicott, D.W. (1958). The capacity to be alone. In: *The Maturation Processes and the Facilitating Environment* (pp. 29–36, 1979). New York: International Universities Press.
- Xu, Y., Farver, J.A.M., Chang, L., Zhang, Z., & Yu, L. (2007). Moving away or fitting in? Understanding shyness in Chinese children. *Merrill-Palmer Quarterly*, 53, 527–556.
- Zimmerman, J.G. (1805). Advantages of solitude upon the mind. (pp. 119–229). London, UK: James Cundee, London.

Evolutionary and Neuroscientific Perspectives on Adaptive Shyness

Raha Hassan*, Taigan L. MacGowan, Kristie L. Poole, and Louis A. Schmidt
McMaster University, Canada

Shyness reflects inhibition and anxiousness in social situations, and has been conceptualized as an emotion as well as an enduring characteristic of one's personality (see Jones et al., 1986). Although shyness is a ubiquitous phenomenon that is observed across development, with estimates exceeding 90% of individuals experiencing it at some points in their lives (Zimbardo, 1977), a smaller percentage of children (~10–15%; Kagan, 1994) and adults (< 40%; Pilkonis, 1977) are characterized as dispositionally or temperamentally shy. Temperamental shyness is associated with a number of distinct physiological correlates of stress-vulnerability, including greater relative right frontal EEG activity, high and stable heart rate at rest, and high morning basal cortisol levels (see Kagan et al., 1988; Schmidt & Miskovic, 2014; Schmidt & Schulkin, 1999, for reviews). Interestingly, these same distinct patterns of resting physiology have been identified in other mammals, including timid and cautious nonhuman primates (see Shackman et al., 2013), suggesting that temperamental shyness may be conserved across mammals. Temperamental shyness also has been linked to a range of internalizing problems (Findlay et al., 2009), but primarily social anxiety (Heiser et al., 2003; Hofmann et al., 2006; Poole et al., 2017). However, we know that not all individuals who are shy experience maladjustment. Some individuals who are shy appear to adapt reasonably well (Schmidt et al., 2017; Tang et al., 2017).

Shyness is an inherently interesting phenomenon to study, not only because of its ubiquity, but because social interaction and social connection are so fundamental to human existence, raising questions regarding the function of shyness and what purpose(s) it serves (see Schmidt & Poole, 2020a). In this chapter, we explore this broader question from evolutionary and neuroscientific perspectives. To this end, we address three specific questions organized around the broader former question: (1) Are there adaptive functions of shyness? (2) What are some of the regulatory mechanisms of adaptive shyness? and (3) How are these self-regulatory mechanisms instantiated in the brain in adaptive shyness?

Are There Adaptive Functions of Shyness?

Temperaments are early-emerging, biologically based, and stable traits that can provide individuals with diverse behavioral strategies that allow them to gain access to resources, reproduce, and coexist within a social hierarchy (Kagan, 1994). The shy-bold continuum, for example, is commonly observed in nonhuman animal species of fish, birds, and mammals (Wilson et al., 1994). Within this continuum, some individuals are more biologically inclined to exhibit risk-taking behavior and approach toward novel stimuli (i.e., bold behavioral strategy) whereas others will display fear and avoidance in response to unfamiliar objects,

individuals, and situations (i.e., shy behavioral strategy; Groothuis & Carere, 2005; Koolhaas et al., 1999; Wilson et al., 1994). Similarly, temperamental behavioral inhibition can be assessed in humans, with these observed tendencies being evident from infancy throughout development (Kagan, 1994). While behavioral inhibition and the shy-bold continuum tend to focus on the extent to which an individual experiences approach or avoidance motivations toward any unfamiliar stimulus, there are also individual differences in responses to unfamiliar stimuli that are of a social nature. Specifically, some individuals will exhibit bolder behaviors with social conspecifics while others tend to experience fear and anxiety when interacting with unfamiliar social partners and when encountering new social situations (see Schmidt & Schulkin, 1999, for a review). Although both responses can be viewed as adaptive, wariness and fear are not always acknowledged to have value in our evolutionary past or in more recent human history. Given how conserved the shy-bold continuum and phenotype appear to be across a range of animal species, it likely has served an important function to species' survival throughout evolution.

Fearful and Self-Conscious Shyness

Shyness has been described as a social ambivalence in which both approach and avoidance motivations are experienced simultaneously and in conflict (Asendorpf, 1990; Coplan et al., 2004; Lewis, 2001). However, the degree to which each of these motivations is experienced varies across individuals. There is empirical support for heterogeneity within shyness and shy expressions across a range of measures in toddlers (Eggum-Wilkens et al., 2015), young children (Poole & Schmidt, 2019c, discussed further later in the chapter), and adults (Bruch et al., 1986; Santesso et al., 2006; Schmidt & Robinson, 1992). For example, individuals who experience heightened avoidance motivations within this motivational conflict are thought to possess an evolutionarily older phenotype known as *fearful shyness*, which tends to emerge relatively early in human development. This type of shyness reflects a heightened sensitivity to social threat and emerges with the onset of stranger fear (i.e., 6–12 months of age; Buss, 1986a,b). Fearful shyness appears to have evolved from a basic fear system to protect individuals from possible physical harm by unfamiliar conspecifics (Schmidt & Poole, 2019). In support of this subtype, there is evidence for a high degree of individual variation in fear responses in mammals (Boissy, 1995), and this variation is evident early in life and is associated with different physiological and behavioral correlates (see Schmidt & Schulkin, 1999, for a review). In all, fearful shyness reflects a dominating motivation for an avoidance reaction to social stimuli and can be seen as a temperamental disposition that is evident from infancy.

In contrast, *self-conscious shyness* reflects a motivation for both approach and avoidance, is expressed later in development (Buss, 1986a,b), and is assumed to have evolved later in human history (Schmidt & Poole, 2019). This type of shyness has been thought to emerge with the evolution of self-awareness and other-understanding. As such, self-conscious shyness does not develop in human children until the preschool years at which time self-awareness is evident (Schmidt & Poole, 2019) and children can take on the perspectives of others (e.g., Wellman & Liu, 2004). Self-conscious shyness has been found to be unrelated to fearful shyness (Eggum-Wilkens et al., 2015) as it is associated with less fear of physical harm and more fear of negative social evaluation, threat to the ego, and social rejection or exclusion (Schmidt & Poole, 2019). This shyness subtype may have evolved in line with selective pressure for behaviors that aid in securing strong human relationships for the purposes of protection, support, and access to reproductive opportunities (Buss, 1999; Gilbert, 1989). Since failure to gain access to these important social resources can result in rejection and loss of social status, preoccupation with self-generated behaviors in the form of self-conscious shyness can be seen as a method for monitoring an individual's impression on social conspecifics (Gilbert, 2001).

Fearful and self-conscious shyness can be evaluated in humans by monitoring facial expressions during avoidance behaviors, such as gaze and head aversions (Asendorpf, 1990). In particular, *nonpositive shyness*, which occurs when an avoidant behavior is exhibited during a neutral or negative facial expression, largely expresses fear and discomfort rather than pleasure (Asendorpf, 1989; Colonnese et al., 2014). Although not all nonpositive expressions of shyness are inherently fearful, this shyness subtype is conceptually linked to fearful shyness (e.g., Schmidt & Poole, 2019). In contrast, *positive shyness*, which is evident when a smile is

present before or during an avoidant behavior, suggests a motivation for both approach and avoidance (Reddy, 2005; Thompson & Calkins, 1996). This expression of shyness has been commonly referred to as a “coy smile,” which involves the highest level of arousal in the smile being immediately followed by a gaze or head aversion (see Colonnese et al., 2013; Nikolic et al., 2016). Although self-consciousness is not always displayed in a positive manner, positive shyness is conceptually linked to self-conscious shyness (e.g., Schmidt & Poole, 2019).

In general, self-conscious shyness may lead to positive facial expressions during shy episodes, which can have many adaptive consequences within social interactions. In contrast, fearful shyness may generally lead to non-positive (i.e., negative and sometimes neutral) facial expressions during shy episodes, which do not grant the same benefits. It is important to note that these shyness subtypes are not mutually exclusive within individuals. Some people may exhibit high or low levels of both self-conscious shyness and fearful shyness (i.e., high levels of positive and nonpositive shyness, respectively) or higher levels of one or the other. For the remainder of the chapter, there are times when we use fearful shyness interchangeably with nonpositive shyness, and self-conscious shyness interchangeably with positive shyness. As we discuss later in the chapter, part of our research program has been directed toward attempting to distinguish among these multiple subtypes and uses on a conceptual and biological level.

Adaptive Aspects of Shyness Subtypes

We argue that self-conscious shyness may be currently more adaptive than fearful shyness, but this claim of course depends on the context in which it is expressed. Although there appear to be adaptive functions to both shyness subtypes, fearful shyness was likely useful in our evolutionary past when unfamiliar social conspecifics were considered physically dangerous. In contrast, self-conscious shyness appears to be more salient in our current social environment as the nature of our social interactions have become more complex. It is also possible that fearful shyness serves an adaptive function in current human history, such as in the case of “stranger danger”, and that high levels of self-consciousness could critically deter an individual from successfully engaging in social interaction. However, we argue that moderate to low levels of self-conscious shyness are more adaptive in most current social situations when compared to fearful shyness and characteristics of extreme self-consciousness.

For example, the *Emotional Reactivity Hypothesis* (ERH) states that less fearful temperaments better allow for the evolution of more sophisticated social processing and understanding. This hypothesis has been explored in canines (Hare, 2007; Hare & Tomasello, 2005) and children (LaBounty et al., 2017; Lane et al., 2013; Wellman et al., 2011) and pertains to social cognition: one of many traits known to increase social sophistication in humans, primates, and other mammals (Hare, 2007). Social cognitive skills, such as Theory of Mind, allow individuals to make social judgments through inferring others’ thoughts, feelings, and beliefs. Better Theory of Mind ability has been found to be positively related to positive shyness while there is evidence to suggest that nonpositive shyness is negatively related to this social cognitive skill (Colonnese et al., 2017; MacGowan et al., 2021). These findings suggest that, over time, less fearful forms of shyness (i.e., positive shyness) may have been selected for as the complexity of human social systems increased. Another adaptive aspect of positive shyness is its potential to increase interpersonal liking and inspire affiliative and prosocial behaviors in others (Colonnese et al., 2014; Keltner et al., 1997).

It has been argued that individuals who engage in higher levels of positive shyness are likely to gain self-esteem from effectively dealing with social challenges and are presumed to learn more from social situations (Thompson & Calkins, 1996). As well, positive shyness among humans and other species may allow for additional time for the individual to learn about and reflect on a conspecific’s motives or intentions before acting and committing to approach- or avoidance-related social behaviors (Schmidt & Poole, 2019). Interestingly, these coy behaviors have been documented in other species (McNamara et al., 2009) and are thought to signal interest while gaining more information regarding the social conspecifics that are present and the safety of the social environment (Candolin, 2003; Wachtmeister & Enquist, 1999).

Work examining positive shyness has also suggested that these expressions might act as an appeasement signal to potentially dominant or threatening social partners. In other primates with similar social systems,

such as chimpanzees and macaques, teeth baring is thought to signal appeasement and affiliation to others (see Parr & Waller, 2006). In humans, some have viewed positive shyness as a placation behavior for real, imagined, or imminent social breaches (Keltner & Anderson, 2000; Keltner et al., 1997). Thus, positive expressions of shyness may allow for cautious and low-risk interaction that involves simultaneous appeasement displays. Some shy behaviors that are associated with appeasement include blushing, head aversion, and gaze aversion. Blushing, which has been found to occur more in children who exhibit high levels of positive shyness (Nikolić et al., 2016), is a physiological reaction to social evaluation and signals that the individual is perceptive to possible social judgments and social norms. Similar to a general expression of positive shyness, blushing conveys that the individual is sensitive to a possible social violation and therefore exhibits appeasement (Castelfranchi & Poggi, 1990; de Jong, 1999; Keltner & Buswell, 1997). Such a reaction has been thought to signal trustworthiness and prosocial behavior (Dijk et al., 2009; Dijk et al., 2011) and in turn is likely to reduce negative evaluation from others (de Jong, 1999). Gaze aversions have also likely evolved as appeasement mechanisms as they are thought to be signals of submission to more dominant individuals (Terburg et al., 2012; Van Honk & Schutter, 2007).

In all, low to moderate levels of self-conscious shyness appear to have many adaptive functions in current human history. Although fearful shyness may be currently useful in some specific contexts, this subtype was likely more adaptive in our evolutionary past when unfamiliar individuals were more likely to be physically threatening. Self-conscious shyness (i.e., positive shyness) can provide appeasement and affiliative signals to others while simultaneously providing the individual with more time to gather information regarding the given social situation. Positive shyness can protect the individual from social rejection and threat to the ego while aiding in gaining access to social and nonsocial resources. Finally, the development of smiling as seen in positive shyness has been thought to be related to physiological processes of arousal. Namely, expressions of positive shyness in early childhood, and even infancy, might exist to reduce arousal during social interaction while simultaneously engaging with another person by holding their interest and attention (Sroufe & Waters, 1976). We discuss the regulatory functions of positive shyness further in the next section on self-regulation in the context of shyness.

What Are Some of the Regulatory Mechanisms of Adaptive Shyness?

Self-regulation is one critical factor that has been heavily implicated in our understanding of shyness in general, and adaptive shyness in particular. Self-regulation has been long regarded as a key component of temperament and personality (Posner & Rothbart, 2000; Rothbart & Bates, 1998). Broadly defined, self-regulation encompasses the behavioral, physiological, cognitive, and affective processes that serve to modulate reactivity in order to support goal-directed behavior (Hofmann et al., 2012). Self-regulation is hypothesized to emerge in early infancy through increased control over orienting responses (Harman et al., 1997; Johnson et al., 1991) and continues to develop throughout the life span, displaying especially rapid development during the early preschool years (Eisenberg et al., 2004; Kopp, 1982).

Self-Regulation and Shyness

Self-regulation has been frequently implicated in the development and maintenance of shyness. As early as the first year of postnatal life, infants display individual differences in inhibition toward social and nonsocial novelty (Calkins et al., 1996; Kagan, 1994; Rothbart, 1988). It has been suggested that self-regulatory capacity may lead to individual differences in behavioral inhibition (wariness in response to novelty, a proposed antecedent of shyness), such that low levels of self-regulation may be associated with relatively higher levels of behavioral inhibition in the context of high negative reactivity (e.g., Rothbart, 1988; Rothbart & Bates, 1998). In support of this theory, shyness in adulthood has been cross-sectionally associated with low regulation and high negative reactivity (Eisenberg et al., 1995), and longitudinally in childhood, high levels of inhibitory control (one component of self-regulation) at 42 months was negatively associated with the trajectory of shyness over 3.5 years (Eggum-Wilkens et al., 2016).

In addition to contributing to the development of shyness, some researchers have even proposed a distinct subtype of shyness in which regulation is of critical importance. For example, Xu and his colleagues have suggested that “regulated shyness” is observed in Chinese children and is culturally-linked to the display of social restraint and modesty in order to maintain social harmony (Xu et al., 2007, 2008, 2009). It is possible that positive shyness in North America functions similarly to regulated shyness in China. Specifically, both positive and regulated shyness appear to be associated with regulatory mechanisms, and both may represent more socially acceptable forms of shyness compared to nonpositive or anxious shyness.

Typically, children’s ability to self-regulate is conceptualized as a positive attribute, regarded as critical for optimal development across functional and socioemotional domains. For example, high levels of self-regulation are known to predict positive social functioning (Eisenberg et al., 1995) and academic success (Graziano et al., 2007; Ponitz et al., 2009), whereas poor self-regulation has been linked to behavioral problems and mental illness across the life span (Gross & Munoz, 1995). Despite these positive aspects of self-regulation, some have suggested that there may be individual differences in the adaptiveness of self-regulation depending on temperamental factors (see Henderson, 2010; Henderson & Wilson, 2017; and Thompson & Calkins, 1996, for reviews).

Some studies have found an interaction between shyness and aspects of self-regulation when examining socioemotional outcomes. For example, in a sample of preschool-aged Italian children in the school context, shyness was negatively associated with teacher-reported prosocial behavior and popularity when preschoolers exhibited higher levels of inhibitory control, but positively associated with regulated school behaviors when children displayed lower levels of inhibitory control (Sette et al., 2018). In a separate sample of preschoolers, behavioral inhibition was positively associated with social anxiety and low social initiative only in the context of high inhibitory control (Thorell et al., 2004). Others have found a similar pattern of results when examining behavioral inhibition, inhibitory control, and anxiety in early childhood. For example, White and colleagues found that, in a sample of preschoolers with high inhibitory control, behavioral inhibition in toddlerhood increased the risk for anxiety problems in early childhood (White et al., 2011). In this same study, behavioral inhibition in toddlerhood increased the risk for anxiety problems for preschoolers with low attentional shifting. White and colleagues speculated that different aspects of self-regulation differentially influence risk for anxiety symptoms in children with high behavioral inhibition, such that high attentional shifting serves as a protective factor and high inhibitory control serves as a risk factor.

Neural correlates of attentional shifting also have been shown to moderate the association between shyness or behavioral inhibition and socioemotional adjustment in much the same way. When individuals displayed neural correlates (e.g., N2 event-related potential response) associated with relatively strong attentional and cognitive control, shyness was positively associated with socioemotional maladjustment (e.g., Henderson, 2010; McDermott et al., 2009). This pattern of results suggests that different aspects of self-regulation (i.e., inhibitory control and attentional shifting) may have different consequences for shy children across different domains of functioning (e.g., social adjustment, academic adjustment, psychopathology).

Our group has found a similar pattern of behavioral results using temperamental inhibitory control and attentional shifting to better understand the relation between shyness and observed social behavior in two different social laboratory contexts in a sample of preschoolers (Hassan et al., 2020). We were interested in children’s attempts at seeking social support from a relatively familiar experimenter during a frustration task where children were precluded from gaining access to a desirable toy. We also assessed children’s social engagement during a stranger approach task when a novel experimenter entered the room and attempted to engage with the child using a standardized script (Goldsmith et al., 1995). We found that attentional shifting, but not inhibitory control, moderated the association between shyness and social support seeking during the frustration task and social engagement during the stranger approach task. More specifically, we found shyness was only negatively associated with social support seeking and social engagement when individuals displayed relatively high levels of attentional shifting, and was unrelated to social behavior when individuals exhibited relatively low levels of attentional shifting.