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## A Lexical Approach to Collective Personality Using Nongroup Members as Raters

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# Walden University

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Walden University  
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Abstract

A Lexical Approach to Collective Personality Using Nongroup Members as Raters

by

Robert Black

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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## Abstract

The construct of personality exhibits utility in predicting group outcomes. However, quantifying a group personality construct has almost exclusively been accomplished by aggregating individual group member five-factor personality scores to derive the group personality score. This type of operationalizing rests on the assumption that collective personality exists and has a five-factor structure, makes results context specific, and limits cross-comparison of different types of groups. The purpose of this quantitative study was to apply a lexical approach and exploratory factor analysis to explore personality structure of a group at a group level. The research question focused on identifying if a construct of collective personality operationalized at the group level through use of a lexical approach would yield a five-factor structure. Exploratory factor analysis was applied to data collected from an anonymous on-line survey administered to a convenience sample of 11 staff at residential treatment facilities for children. Data were not able to be subjected to tests for sampling adequacy before primary component and factor extraction due to the low sample size and the resulting factors did not rotate in 25 iterations. Despite these limitations, results suggest the lexical approach can be applied to quantifying the construct of collective personality. Results also provide support for a collective personality structure that may differ from the five-factor model of individual personality structure. These findings inform on a possible new way of quantifying and studying group characteristics which could lead to social change through better ways of understanding, predicting, and changing group behavior in a wide variety of domains.

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## Table of Contents

|                                   |    |
|-----------------------------------|----|
| List of Tables .....              | iv |
| Chapter 1 .....                   | 1  |
| Introduction.....                 | 1  |
| Background.....                   | 3  |
| Problem Statement.....            | 7  |
| Purpose of the Study.....         | 8  |
| Research Questions.....           | 9  |
| Conceptual Framework.....         | 9  |
| Nature of the Study.....          | 10 |
| Definitions.....                  | 11 |
| Assumptions.....                  | 12 |
| Scope and Delimitations .....     | 13 |
| Setting.....                      | 13 |
| Measure.....                      | 14 |
| Limitations .....                 | 15 |
| Study Setting.....                | 15 |
| Study Participants .....          | 17 |
| Significance.....                 | 17 |
| Summary.....                      | 18 |
| Chapter 2: Literature Review..... | 20 |
| Introduction.....                 | 20 |

|                                                                     |    |
|---------------------------------------------------------------------|----|
| Literature Search Strategy.....                                     | 22 |
| Conceptual Framework for Lexical Approach .....                     | 24 |
| Historic Foundations .....                                          | 24 |
| Modern Foundations .....                                            | 25 |
| Literature Review Related to Key Variables and Concepts.....        | 26 |
| Lexical Approach.....                                               | 26 |
| Collective Personality .....                                        | 28 |
| Summary and Conclusion.....                                         | 39 |
| Chapter 3: Research Method.....                                     | 41 |
| Introduction.....                                                   | 41 |
| Variables, Research Design, and Choice .....                        | 41 |
| Methodology .....                                                   | 43 |
| Population .....                                                    | 43 |
| Sampling and Sampling Procedures .....                              | 43 |
| Procedures for Recruitment, Participation, and Data Collection..... | 45 |
| Follow-up Procedures .....                                          | 46 |
| Instrumentation and Operationalization of Constructs .....          | 47 |
| Data Analysis Plan.....                                             | 48 |
| Threats to Validity .....                                           | 49 |
| Ethical Procedures .....                                            | 51 |
| Summary .....                                                       | 53 |
| Chapter 4: Results.....                                             | 54 |



|                                                            |    |
|------------------------------------------------------------|----|
| Introduction.....                                          | 54 |
| Data Collection .....                                      | 55 |
| Results.....                                               | 59 |
| Summary.....                                               | 63 |
| Chapter 5: Discussion Conclusion and Recommendations ..... | 64 |
| Introduction.....                                          | 64 |
| Interpretation of the Findings.....                        | 64 |
| Limitations of the Study.....                              | 66 |
| Recommendations.....                                       | 66 |
| Implications.....                                          | 67 |
| Conclusion .....                                           | 68 |
| References.....                                            | 70 |
| Appendix A: Goldberg’s 540-term Adjective Set .....        | 77 |
| Appendix B: Participant Response Item Detail .....         | 82 |
| Appendix C: Component Matrix .....                         | 93 |

## List of Tables

|                                                 |    |
|-------------------------------------------------|----|
| Table 1. Gender Demographic Data .....          | 57 |
| Table 2. Level of Education.....                | 57 |
| Table 3. Length of Time with Group .....        | 58 |
| Table 4. Participant Age .....                  | 59 |
| Table 5. Total Variance by Component.....       | 61 |
| Table 6. Adjective Loading and Percentage ..... | 62 |

## Chapter 1

### **Introduction**

Attempting to understand human behavior at a group level is not a new endeavor. Early literature highlights the construct of a social personality as a way of explaining behavior on a large scale in terms of moral, religious, and political beliefs of cultures (Hayden, 1909). The behavior of groups, or rather, the prediction, modification, and manipulation of group behavior, has been a focus of military funded research for the past 60 years (Goodwin et al., 2018). Social psychology and, in the later part of the 20th century, Industrial organizational psychology, have a history of attempting to understand the behavior of groups in order to better the outcomes of group processes (Mathieu et al., 2018). In the current literature on teams, groups, and their respective behavior in organizational and social contexts, the construct of a group personality has emerged as a way of quantifying characteristics of group composition. This construct underpins much of the current research on how changes in group composition impact performance of the group at the group level (Mathieu et al., 2014).

Despite extensive literature exploring group personality composition as a predictor of group outcome, there is no universal way of operationalizing the group personality characteristics. Rather, operationalization of group personality composition in the current literature is driven by group task types and based on a task typology developed by Steiner in 1972. Steiner's typology classifies group tasks as either additive, conjunctive, disjunctive, or discretionary (Steiner, 1972). Each task type requires a different way of aggregating individual group member personality characteristics with the

result of the aggregation process representing the group personality profile. In modern research, this task typology and aggregation approach to group personality often incorporates the modern five-factor structure of personality by aggregating individual scores of the five-factor personality dimensions to develop the group personality profile (Halfhill et al., 2005; Peeters et al., 2006; Roberge et al., 2012; van Vianen & De Dreu, 2001). Though this method is useful for exploring group behavior within a specific context, the task specificity on which the method is based makes cross comparison with other types of groups difficult. In addition, a task typology-based way of aggregating individual group member personality characteristics to develop a group personality is pinned to individual group member willingness to complete an individual personality measure.

The following research leveraged the high frequency staff/resident group interactions at residential treatment facilities, as well as the limited outside influence characteristic of the study setting to improve validity of research results and explore if a lexical approach could be used to identify personality structure of a group at a group level and without use of individual member personality profiles. In contrast to the method of operationalizing group personality characteristics used in current literature, the following research method did not require individual group member participation and was not bound to task specificity. These characteristics of the research greatly increase its generalizability and subsequently allow for comparison of collective personality characteristics across different domains, tasks, or organizational or social contexts. In addition, these characteristics may serve as a foundation for future context-specific

research in settings like criminal justice or with populations like children where individual participation is either not likely or not possible.

This chapter is organized into 12 additional sections beginning with a brief summary of the current literature relating to the intersection of the constructs of groups and personality. In subsequent sections I provided a description of the conceptual framework that underpins the study and methodology, as well as a rationale for how the study fills the current gap in literature. The chapter contains a detail of the research questions, scope, limitations of the study, as well as description of the assumption implicit to the research question, conceptual framework, and methodology. The chapter concludes with an overview of the significance of the research.

### **Background**

The construct of personality is prominent in literature on human behavior and is often used as a framework for understanding the behavior of individuals within a given domain. The construct of group membership is also an important component of the same domains of human functioning (Liu et al., 2015) and has been a focus of many areas of research. Additionally, the construct of a group and the body of research on the construct has significant overlap with research on personality. A PsycINFO database search using the key terms “group” and “personality” yielded 7,084 articles published between December 2015 and June 2019. With over 3,000 published articles in a 2-year period, interest on the intersection of group dynamics and personality is high.

The overlap in the literature between the construct of a group and the construct of personality results from the ability of group membership to modulate behaviors of

members within the group. For example, in adolescent peer groups, peer cognitions were found to play a significant role in modulating selection of aggression targets with shared targets of aggression being more likely among friends than nonfriends (Card & Hodges, 2006). Research on small group dynamics highlights how group attendance rates for interpersonal growth groups can be influenced by the quality of the interpersonal interactions between group members during group sessions (Paquin et al., 2011). The modulatory effect of group membership on individual group member behavior generalizes across different types of constructs as well as different types of domains. In a review of research on small groups from seven different disciplines, (Liu et al., 2015) concluded that there is clear evidence across multiple disciplines that a relationship exists between group member personalities and group process outcomes. In addition, the review further described the way group traits are operationalized as moderators of this relationship (Liu et al., 2015).

The relationship between group membership and group member behavior is not unidirectional. This is evidenced in the U.S. military's long history of funding and exploring the intersection between individual personality and effective work teams in order to understand how to build the most effective team for a given set of tasks (Goodwin et al., 2018). It is also highlighted in research on the effects of group composition on group psychotherapy outcomes (Kealy et al., 2016). In these lines of research, the personality characteristics of individual group members are often categorized as one of the dimensions of the five-factor model and framed as a moderating variable with group performance being the dependent variable. Similar lines of research

exist in the industrial organizational field where work group teams are the focus. Within this focus, individual team member attributes and five-factor model personality dimensions serve as a primary component of the input-process-output framework that underpins much of the important research in the field (Mathieu et al., 2018).

The impetus behind research combining the construct of groups and the construct of personality is rooted in the above-mentioned modulatory effect as well as the functional utility of understanding mechanisms of group behavior. By understanding, controlling, and manipulating the mechanisms responsible for modulating behaviors of groups, organizations funding research on group personality and its relationship to group outcome hope to develop the ability to shift the behavior of a given group in a desired direction (Goodwin et al., 2018). Whether exploring prediction of aggression in adolescents, attendance in personal growth groups, or how to build an effective workgroup, the synthesis of personality and the construct of groups has clear utility.

Despite the utility of research on the intersection between the constructs of personality and groups, most of the research on personality and group behavior, as well as the subsequent predictive utility of such research, explores predictors of group behavior relating to personality primarily at an individual level. For example, though qualitative research on models of group thinking contributed to development of the Group Thinking Measure, this measure derives a group score by combining an individual score on a nonverbal reasoning matrix with a difference between that individual score and a positively correlated group score on the same matrix (Wegerif et al., 2017).

Studies on the construct of collective personality come perhaps the closest to synthesizing and exploring the construct of groups and personality at a group rather than individual level. In their exploration of the development of collective personality, Ogunfowora and Schmidt (2015) outlined the difference between group personality composition and collective personality. Group personality composition refers to statistically configured aggregate-level constructs derived from individual group member personality components whereas collective personality represents a potentially unique structure specific to the group and distinct from the aggregate structure (Ogunfowora & Schmidt, 2015).

Though there is a significant body of research devoted to understanding group behavior, the research is not cohesive with each individual line of research pinning understanding of group behavior to the specific domains or constructs of the individual models. Examples include (a) the application of the needs-based model of reconciliation to understand peer collaboration in resolving conflict (T. Goldberg & Kupermintz, 2017), (b) use of the interdependence theory to frame workgroup behavior (Priesemuth et al., 2013), or (c) uncertainty-identity theory as a framework for understanding radical groups and radical group behavior (Hogg & Adelman, 2013). Each provide a different lens through which to understand the respective group or behavior. However, the models have contextually specific components that limit their universality. I propose this limitation may be rectified by using the widely accepted five-factor model of personality as a construct or platform for understanding groups in a way that generalizes across multiple



domains and contexts. However, to achieve this, a five-factor model of collective personality must first be operationalized at a group level.

In the following research I explored the construct of collective personality by applying a lexical-based approach to categorizing behavioral traits or characteristics of groups at the group level rather than the individual level by using nongroup members to rate characteristics of groups. This research helped fill the gap in the literature on group behavior by expanding the basis for understanding group behavior across various domains, situations, and demographics at a group level rather than an individual level. The result of the quantitative research on establishment of a lexical-based foundation for the construct collective personality may contribute to development of the ability to predict group behavior in a variety of settings including but not limited to education, industry, mental health, and social functioning. The implication of this type of predictive ability resonates across important areas of social change. By establishing a generalizable model for understanding group behavior, interventions designed to shift group behavior in desirable directions can be developed and applied.

### **Problem Statement**

The field of psychology has a history of exploring the potential value of a group personality construct (Roback, 1935). However, much of the literature on group personality relies on operationalizing the group personality construct by aggregating the individual personality traits of group members, which poses a significant limitation to the utility of the construct. Predicting group behavior becomes difficult when using current literature and findings because individual group member behavior is not static; rather, it

is a function of a complex intragroup dynamic as well as influencing factors like organizational context (Bell et al., 2018) that rest outside the group dynamic. Just as aggression rates for any given adolescent group are not equal to the sum of aggression rates for individual group members (Card & Hodges, 2006), neither is any group behavior likely a sum of individual member rates for that behavior. Though I found only one research study that operationalized a construct of group personality at a group level rather than through an aggregating process (Hofmann & Jones, 2005), this research relied on intragroup raters of group personality characteristics. In addition to having limited generalizability of results due to the number of raters being limited by the number of group participants, the methodology was not generalizable to other types of groups in which participation of the group members may not be feasible or desirable. These limitations and the overall limited amount of research on group level measures of collective personality highlight the problem that a universal foundation for quantifying and understanding group behavior across multiple domains, situations, and demographics does not currently exist.

### **Purpose of the Study**

This quantitative research was intended to establish a foundation for the construct of collective personality through application of a lexical-based approach and an adjective checklist to identify latent variables of collective personality by categorizing behavioral trait adjectives or characteristics of groups at a group level rather than an individual level through use of nongroup members ratings of the trait adjectives.

### **Research Questions**

RQ: When a lexical approach and factor analysis is applied to residential treatment facility staffs' ratings on the degree to which 540 trait adjectives describe the group of residents with which the staff work, how many latent variables will be identified?

*H*<sub>0</sub>: When factor analysis is applied to a Likert scale rating of 540 trait adjective descriptions of group characteristics, the analysis will not yield 5 factors.

*H*<sub>1</sub>: When factor analysis is applied to a Likert scale rating of 540 trait adjective descriptions of group characteristics, the analysis will yield exactly 5 factors.

### **Conceptual Framework**

The conceptual framework that grounded this study in the scholarly literature is the lexical hypothesis that serves as a basis for the modern factor-based conceptualization of personality structure (Ashton & Lee, 2005a, 2005b; Goldberg, 1990, 1993; Norman, 1963; Oliver et al., 1988). The way individuals perceive others and incorporate their perceptions into language serves as the foundation for lexical-based personality taxonomies like the five factor model (Friedman & Schustack, 2009). The lexical hypothesis, which assumes descriptors of important differences between individuals are incorporated into language, can be expanded to support the idea that language-based differences can be functionally used to describe not only personality traits of an individual but of a group of individuals. The lexical approach to describe groups rather than individuals has been used indirectly in current research on group and collective personality by means of five factor measures of personality (Bradley et al., 2013; English

et al., 2004; Hofmann & Jones, 2005; Ogunfowora & Schmidt, 2015). Though this research often derives data through administration of some type of measure of the big five personality traits, the lexical approach serves as a major conceptual foundation for the five factor model itself and perhaps the first system used for identifying universal personality characteristics (McCrae & John, 1998). However, despite serving as a foundation for much of the current research on group and collective personality, I was not able to find any research in which the lexical approach was applied directly to the exploration of the factor structure of small groups. Rather, current research methodologies rest on the a priori assumption that a collective personality exists as evidenced by the use of an aggregation process to quantify personality structure at a group level (Bell et al., 2018; Mathieu et al., 2014; Ogunfowora & Schmidt, 2015). These methodologies that quantify that structure through aggregation of individual level group scores on individual personality measures are discussed in more detail in Chapter 2. In contrast to the indirect use of the lexical approach in current literature and the a priori assumption that collective personality exists, in the following research I sought to apply the lexical approach directly to small groups as a means of exploring a novel way to verify and operationalize the construct of collective personality through direct measure of the construct at a group level.

### **Nature of the Study**

The nature of the study was a quantitative exploratory factor analysis (EFA). In the tradition of earlier foundational research using a lexical approach as a primary method for establishing or identifying individual personality factors thought to be

relatively universal (Ashton & Lee, 2005b; McCrae & John, 1998; Saucier & Goldberg, 2001), an adjective checklist was anonymously completed online by direct-care staff of residential treatment facilities for adolescents. The checklist required participants to use a Likert scale to rate the degree to which 540 trait adjectives describe a group of residents with which the participants work. I applied factor analysis procedures to the collected data to determine if factor extraction yields factor solutions similar to the five-factor solutions found in the literature on personality structure.

### **Definitions**

The research included terms that may not have a universal meaning across domains or disciplines. For this reason, I provide definitions of several terms below.

*Collective personality:* Collective personality is defined as a group-level construct that describes regular behavioral characteristics or observable qualities of a group (Hofmann & Jones, 2005; Roberge et al., 2012)

*Direct-care staff:* I have defined direct-care staff as staff at a residential treatment facility who (a) have regular interactions with the residents; (b) are responsible for care, safety, and supervision of the residents; and (c) are responsible for implementation of and ensuring residence compliance and adherence with facility rules, procedures, and protocols.

*Group personality:* Group personality is defined as a group-level construct describing behavioral characteristics or observable qualities of a group and is derived from aggregating various combinations (e.g., mean, variance, minimum, and maximum) of individual group member personality characteristics (Ogunfowora & Schmidt, 2015).

*Residential treatment facility:* Residential treatment facility is defined as an acute care facility for treatment of mental health disorders in which the clients reside at the facility, receive services to address psychiatric, behavioral problems (Office of Juvenile Justice Delinquency Prevention, 2011).

### **Assumptions**

This research rested on assumptions established in earlier literature on the use of a lexical approach to explore or quantify the construct of personality as well as assumed characteristics and abilities of research participants.

- Important characteristics of a group are encoded into language used by others to describe the group (Ashton & Lee, 2005a).
- The primary descriptors of personality characteristics encoded in the group lexicon are likely single words (Oliver et al., 1988).
- The adjective checklist used in the study incorporated or captured the abovementioned descriptors.
- A collective personality had developed within the groups with which the study participants work, and study participants were aware of the characteristics of that personality.
- Research participants were truthful and understood the research questionnaire.
- Research participants were familiar with the group that they rated.

## Scope and Delimitations

### Setting

Exploring if a lexical approach can be used to quantify a group personality using nongroup members is likely possible in a variety of settings. However, the study population for the following research consisted of direct-care staff at a residential treatment facility for adolescents labeled severely emotionally disturbed in California and research results may have limited generalizability outside this area. The geographic location of the research population was a function of convenience. The choice of population and setting leveraged the unique attributes of the direct-care staff's work environment to mitigate potential intervening variables in the development of a stable collective personality. Primary intervening variables included length of time since formation of a group and outside group influences. Using direct-care staff at residential treatment facilities as the study population minimized the impact of these variables on the research data and improved the internal validity of the study.

The length of time since the beginning of a group's formation was an important variable in the stability of a collective personality with higher levels of stability often being contingent on longer time together or more frequent or intense interpersonal group member interactions (Ogunfowora & Schmidt, 2015). Residential treatment facilities for adolescents labeled as severely emotionally disturbed often house their residents in small groups of three to six adolescents. Individual group members live together, eat together, and in facilities like those this research accessed that have self-contained classrooms, attend school together. This type of structure and almost continual interpersonal

interaction between group members serves as a catalyst for quick formation of collective personality. By using a participant pool consisting of direct-care staff from this type of residential treatment facility, I leveraged the high frequency contact and interpersonal interaction between group members as a tool to minimize any effect length of time since group formation had on the development of a stable group personality within the adolescent groups. Minimizing this variable within the study design rather than during or after data collection also allowed me to make the a priori assumption that, for any given group of residents in the facility, a collective personality exists. This assumption, in turn, allowed the focus of data collection and analysis to remain centered on the use of a lexical approach with nongroup members as a potential way to quantify a collective personality rather than on managing or identifying variance contributions of intervening variables.

### **Measure**

The following research included use of a referent shifted adjective checklist to collect ratings on descriptive characteristics of a group by nongroup members familiar with the group. My choice to use this checklist was rooted partially in the relatively small sample size of the study and partially in the ease of administration.

The adjective checklist consisted of 540 descriptive words or phrases used to describe the personality of the target group. The list of adjectives used for the research, referred to in other literature as Goldberg's 540-term set, was developed by Goldberg (1990) at the Oregon research institute and serves as a foundation for multiple lexical-based studies that support the modern five-factor model of personality (see Appendix A).



The 540-term set was provided directly to this researcher from Goldberg via personal communication on September 10, 2018.

## **Limitations**

### **Study Setting**

Though I sought to provide evidence for the ability to use a lexical approach to quantify collective personality without the use of ingroup members, there were limitations to the study. The primary limitations of this study related to the study sample and the study environment. Current as well as historic research on the construct of collective personality often focused on adult work teams with specific tasks or team goals related to the team's work context (Mathieu et al., 2018). This is likely related to the initial exploration of collective personality being rooted in military research designed to explore individual components of effective teams (Goodwin et al., 2018). The use of direct-care staff at a residential treatment facility for adolescents and the resulting study environment provided a study sample with functional equivalence to the current adult team-based research on collective personality. However, unique qualities of the groups for which the study participants were asked to provide adjective ratings and the study environment itself made results of the study difficult to generalize to other types of environments.

Though the procedures of the research did not involve any interaction with or measurement of individual adolescents, the results of the measures used in the research were based on descriptions of groups comprised of adolescent members. Despite the functional equivalence of adolescent groups in the research to adult groups in existing

research on collective personality, to my knowledge there is no existing research that quantifies the construct of group personality using adolescent teams as the measured group. There may have been latent characteristics present in adolescent groups that were not present, or present to differing degrees, in adult groups and that makes the resulting factor analysis results not generalizable outside the study setting.

The setting of the study also served as a limitation. Current research on collective personality highlights the way context can influence attributes of individuals and teams or groups. Context can influence not only the salience of specific attributes in a group but can also “cue the desirability of behavior and generate a common perception and motivation” in the group (Bell et al., 2018, p. 354). Being primarily an involuntary type of residential placement, the context of treatment facilities for adolescents categorized as severely emotionally disturbed likely is qualitatively different than other contexts in which quantifying the construct of collective personality may be useful. For one, the frequency and intensity of group-member interactions in the context of a residential treatment setting is significantly different than in other settings. In addition, behavioral expectations including permissible and nonpermissible behaviors in the residential setting are likely very different than other types of settings. These qualitative differences in context likely influenced the behavior of individuals within the environment and subsequently the observable attributes of any group in the facility.

I purposefully designed the current study to avoid the potential legal and ethical issues relating to privacy, confidentiality, and research within protected populations such as residents of an adolescent treatment facility. Subsequently, my lack of interaction with

or knowledge of individual facility residents, coupled with the research design's reliance on questionnaire responses from staff made addressing the abovementioned limitations difficult. Because the major limitations of the research design related to characteristics of the research environment that were not able to be manipulated, the most reasonable way to address the limitations was through post-hoc analysis and discussion of the limitations as they related to the results and comparison of results with other lexical approach studies.

### **Study Participants**

In addition to the limitations related to the study environment, the potential limitations of this research related to characteristics of the study population. The length of time that individual study participants have known or worked with the groups for which they provided ratings (Time Known) may have influenced the outcome of the ratings. To address this variable, participants were asked to provide information on the length of time they had known/worked with the group(s) for which they were providing ratings as part of the demographic data. This procedure allowed for post-hoc analysis of the potential influence of the Time Known variable on the research outcome if needed.

### **Significance**

As far as I am aware, there is no research that applies the lexical approach used to develop the modern construct of individual personality to the construct of collective personality. Though there is an abundance of research on the constructs of group and collective personality, the current body of research rests on the a priori assumption that a collective personality exists. The following research helped fill the gap in literature by

exploring a direct way to verify and/or measure the construct of collective personality at the group level. It also provided a foundation for expansion of research on the application of collective personality beyond the current literature, which is almost exclusively focused in the industrial organizational field of psychology and/or exploration of group composition in organizational work teams (Mathieu et al., 2018).

In addition to filling gaps in the current literature, the research has pragmatic implications for social change. All current research on group and collective personality was based on willing research participants or in-group participants as the source of information for operationalizing group or collective personality. Whereas the application of these research results may provide a foundation for development of strategies to “build” better or more efficient teams, the requirement of in-group or team member participation in the quantification of the group or collective personality limits the generalizability of the constructs. There are social contexts other than organizational work teams, like the criminal justice system and residential treatment facilities, in which the application of a collective personality construct could be a useful tool for influencing outcome of group behavior but in which the direct and willing participation of individual group members may not be desired or even possible. The following research provides a potential way to leverage the construct of collective personality in these types of contexts.

### **Summary**

This research was intended to explore if a lexical approach could be used to quantify the construct of collective personality at a group level by using nongroup members to rate the characteristics of a group. Though there is a large body of research

on group personality and some research on the construct of collective personality, there is very little research that operationalizes either construct at a true group-level. Most of the research is based on aggregating group member scores on individual personality measures to quantify a group personality construct. The research that does use group-level operationalization of a collective personality construct relies on the use of in-group raters to quantify the constructs. Though this type of research provides a solid foundation for practical application of the constructs of group and collective personality, the operationalizing methods in the current body of research pose significant limitations. Aggregation methods used to quantify group personality are domain and task specific making cross-comparison of group personality structure between groups in different domains difficult. In addition, the exclusive use of in-group member ratings as the source of data to quantify either the group personality or collective personality construct limits the generalization of research results because the inter-rater agreement is limited to the small number of group members.

The following literature review provided a background for the etiology of limitations in the current research and addressed by the following research. This review highlighted the search strategy I used to identify the current gap in literature as well as an overview of the relevant literature relating to major developments, processes, and constructs of group and collective personality. In addition, the following review described common applications of the constructs of group and collective personality and how these applications frame the purpose of the following research.

## Chapter 2: Literature Review

### **Introduction**

In my research I sought to establish a foundation for the construct of collective personality by applying a lexical-based approach to categorizing behavioral traits or characteristics of groups at the group level rather than an individual level through use of nongroup member ratings of the group characteristics.

The field of psychology has a long history of exploring the application and benefits of applying the construct of personality to groups (Roback, 1935). Though initial forays in this type of application began with military research (Goodwin et al., 2018), the current literature exploring and supporting the practical applications of group and collective personality constructs were primarily within the field of industrial organizational psychology. In these lines of research, the constructs of group or collective personality were sometimes used interchangeably and often used as tools for predicting outcome of group performance on domain specific task or overall group performance (Mathieu et al., 2018). However, despite the large body of research on the construct of group personality and the burgeoning research on the construct of collective personality, the utility of the constructs in current literature is limited by the methods used to operationalize the constructs and the a priori assumption that the construct of individual personality and its underlying factor structure generalizes to groups of individuals while maintaining the underlying personality factor structure.

Much of the research on group personality, though applying the construct at a group level, operationalized the construct of group personality through individual level

analysis by aggregating individual group member personality traits to derive a group level personality profile (Bell et al., 2018; Mathieu et al., 2014; Ogunfowora & Schmidt, 2015). Despite the volume of research on group personality conducted in the past 5 decades, the aggregation methods used in current research continued to be based on a task typology suggested by Steiner's 1972 seminal book on collective group processes *Group Processes and Productivity*. In his book, Steiner advocated for different aggregation processes to be used for different types of tasks (Steiner, 1972). Based on Steiner's typology, (a) additive tasks prescribe a mean average of group member characteristics, (b) disjunctive tasks should base operationalization on the highest scores on a particular characteristic, and (c) conjunctive tasks should use operationalizations based on the lowest member scores in each of the group characteristics (Mathieu et al., 2017; Steiner, 1972). This type of operationalization makes generalization of findings across settings or contexts difficult as the operationalization methods are context as well as task specific. In addition, use of this type of operationalization becomes complex when teams engage in more than one type of task.

Operationalizations of group personality in the current literature also are limited by the underlying assumption that the aggregation of individual group member personality characteristics will accurately reflect group personality. Some current research highlights that individual group member behavior and subsequent personality factors are a function of not only complex intragroup dynamics but also influencing factors that rest outside the group dynamic like organizational context, time since group formation, and characteristics of the group leadership (Bell et al., 2018; Hofmann &

Jones, 2005; Ogunfowora & Schmidt, 2015). Current methods of operationalizing group personality by aggregating individual member personality components do not account for the modulatory effects of these variables and may not accurately reflect the characteristics of the group as a whole.

The following section provides an overview of the search strategies used in establishing the need for my research. In addition, it provides a review of major concepts relating to the constructs of group and collective personality as well as an explanation of the conceptual framework on which my research was based. This chapter includes a review of current literature on collective personality as well as the use of the lexical approach in the study of these constructs. The chapter concludes with a summary of major themes in the current literature and a review of what is currently known about the constructs of group and collective personality.

### **Literature Search Strategy**

The literature review strategy for the following research began with a general open-ended search of PsychINFO and PsycARTICLE databases using the search terms *group personality*, *collective personality*, and *team personality*. Results yielded 2,928 published works using the search term group personality, 58 using the term collective personality, and 193 using the term team personality. After the initial search and identification of seminal literature and lines of research, I refined search results and limited them to the past 5 years. Limiting the search results to recent publications yielded significantly fewer results.



The PsychINFO and PsychARTICLES search for published articles between 2013 and 2018 using the term *group personality* yielded 670 published articles with varying degrees of relevance to the research. Similarly, the revised and more restricted search strategy using the term *team personality* yielded 61 articles with many of the articles focusing on the relationship between individual team member personality traits and team performance.

Though the initial search strategy and the subsequent revised and more restricted search strategy highlighted a well-established and rich research history on the intersection between the constructs of groups and personalities, there were limited articles that addressed the operationalization of group personality at a group level. Rather, the majority of relevant articles used the established aggregating process to operationalize group personality. In contrast, and highlighting the gap in literature my research fills, results of a PsychINFO and PsychARTICLES database search between date range of 2013 to 2018 using the search term *collective personality* yielded 18 articles. Of these 18 articles only 11 were related to research on human subjects with the remaining seven focusing on collective personality behavior of insects. An additional search of the SocINDEX database using the term *collective personality* was conducted to identify research on the construct of collective personality rooted in the field of sociology. Results yielded a total of 27 publications since 1937, two publications since 2002, and only 4 publications since 2012. Of the 4 publications since 2012, three of them were related to the construct of national identity or a related topic and the fourth was related to the development of the psychosocial construct.

Finally, the literature search strategy for the conceptual framework that grounded this research in the literature consisted of an open-ended search of PsychINFO and PsychARTICLE databases for published peer reviewed articles using the search terms *lexical approach*, *lexical hypothesis*, and *lexical studies*. No limiting dates were applied to this search because the lexical approach served as the underlying conceptual framework for this research and major assumptions of the research are rooted in the etiology of the lexical approach.

### **Conceptual Framework for Lexical Approach**

#### **Historic Foundations**

Though the field of psychology has a long history of trying to develop taxonomies to describe the construct of personality, the abstract nature of the construct makes developing taxonomies challenging (Cattell, 1943). In contrast to taxonomies in sciences, such as biology and chemistry that use descriptions of physically quantifiable characteristics of their respective subjects as the primary method of classification, taxonomies of personality in the field of psychology are not rooted in physically measurable phenomena. Rather, taxonomies of personality rely on classification of abstract attributes or characteristics of an individual's behavior (Oliver et al., 1988).

The use of a lexical approach in the development of personality taxonomies has roots in the early part of the 20th century with pivotal figures such as L. Klages, G. Allport, and R Cattell setting the foundation for the use of natural language as a basis for a classification system (Goldberg, 1993). During the early forays into identifying elementary and universal dimensions of personality based on descriptions of individual

behavioral traits, the use of natural lexicons served as the foundation for the descriptive trait names (Hollingworth, 1938). Early works by these seminal personality theorists also outlined factor analysis procedures that provided a scientific way of identifying functionally distinct components or factors of the personality construct (Cattell, 1943). Both Allport and later, using Allport's work as a springboard, Cattell developed lists of adjectives as the foundation for rating scales used to quantify personality traits (Allport & Odbert, 1936; Goldberg, 1993; Norman, 1963). These scales along with the resulting data collected served to codify support for a universal factor-based structure of personality and heralded the next wave of trait-based research that would eventually lead to the modern five-factor structure of personality in the field of psychology (McCrae & Costa, 1987, 1997).

### **Modern Foundations**

In the mid to late part of the 20th century, additional researchers exploring trait-based approaches to personality further refined or reorganized the original term sets of Cattell and/or developed term sets of their own in continued efforts to identify the universal structure of personality (Oliver et al., 1988). Particularly important was the work of L. R. Goldberg. During the decade spanning 1975 to 1987 Goldberg administered "large sets of trait-descriptive adjectives to sample subjects" (Goldberg, 1993, p. 29) in an effort to continue refining the understanding of the structure of personality. Subsequent factor analysis of the results from these adjective lists consistently produced strong evidence for five broad factors of personality and further solidified the five-factor model of personality as a major construct or model within the

field of personality psychology (McCrae & Costa, 1987; McCrae & John, 1998). The work of Goldberg was also pivotal in persuading Costa and McCrae, who became the “most influential proponents” (Goldberg, 1993, p. 30) of the five-factor model, that five factors were indeed the most appropriate way to account for differences in personality (Goldberg, 1993).

The use of trait descriptors or a lexical approach to explore the factor structure of personality is not confined to Anglo-Germanic based languages. The lexical approach to studying personality structure has been used in various cultures with varying languages including German, Polish, Czech, Turkish, Dutch, Italian, Hungarian, Korean, Hebrew, and Filipino (Ashton & Lee, 2005b; Saucier & Goldberg, 2001). Though the results of lexical-based research on factor structure in each of these languages yielded factor structures ranging from as few as three factors to as many as seven factors (Saucier & Goldberg, 2001), the applicability of the approach is clear. Using the natural lexicon of a culture or group to classify the characteristics of others within that culture or group provides a powerful way to quantify personality structure.

### **Literature Review Related to Key Variables and Concepts**

#### **Lexical Approach**

The methodology of the following research was based on the application of the lexical approach to identifying universal attributes of individuals that in aggregate describe a personality. Though there is no research directly applying the lexical approach to the identification of collective personality factors, there is a large amount of research supporting use of the approach as a viable means of doing so. Though a detailed etiology

of the lexical approach is beyond the scope of this literature review, research within the past 2 decades has highlighted the applicability of the approach to the current research and provided a foundation for the generalizability of the approach from individuals to groups.

Saucier and Goldberg (2001) presented a review of research that not only highlight the strengths of the approach but extended the universality of the lexical approach beyond the Anglo-Germanic languages and informed on its utility. In 2001, Saucier and Goldberg compared studies across various languages that used a lexical approach and EFA to identify a factor structure of personality. In aggregate the reviewed studies encompassed 11 different languages and ranged from 1932 to 1999. The results of the review do not suggest that factor structures of personality resulting from a lexical approach are consistent across cultures/language. In fact, the review highlighted the lack of a common factor structure across all the studies with difficulty in comparing study results related to variability in descriptor selection methods, study populations, and challenges in comparing extracted factors across languages. However, the salience of Saucier and Goldberg to this study was found in the usefulness of the approach not the results of the individual studies. Just as the Saucier and Goldberg review clarified the utility of the approach in comparing personality structures across languages despite differences in the structures, the review also informed on the ability of the approach to be useful in comparing structures of collective personalities across different social, cultural, and institutional contexts.

The utility and appropriateness of the lexical approach to identifying personality structure highlighted in Saucier and Goldberg (2001) was bolstered by the Ashton et al. (2004) review of psychological studies across seven languages. In their review, Ashton et al. outlined support for a six-factor solution by highlighting the frequency of six factor solutions across the breadth of languages included in the review. Again, as with Saucier and Goldberg, the relevance of the Ashton et al. research to the current literature was not in the debate over whether there are five, six, or seven factors to personality, but rather in the process used to determine those factors. Ashton et al. provided a brief discussion of the methodology used in the psychological studies examined in the research. In each study examined in Ashton et al. researchers relied on “a large number of single, unclustered adjectives that describe normal personality variations” (p. 375). In addition, researchers omitted terms in these lists that were evaluative rather than behavioral descriptions. Though researchers in Ashton et al. cautioned that methods for selection of descriptive adjectives used in psychological approaches likely influence any resulting factor structure and made an argument for re-organization of the modern Big Five personality factors, the utility of the lexical approach is clear. The use of an adjective-based lexical approach in combination with EFA is a viable, replicable, and generalizable way to identify personality structure.

### **Collective Personality**

There is very little research on the construct of collective personality. In much of the current literature, the terms collective personality and group personality are either used interchangeably or collective personality is operationalized as an aggregation of

group level individual personality scores on a standard personality measure (Bell, 2007; Roberge et al., 2012). However, there is no research exploring collective personality defined as a group-level construct that describes regular behavioral characteristics or observable qualities of a group (Hofmann & Jones, 2005; Roberge et al., 2012).

Subsequently, the following review highlights the limited research that does exist as well as relevant processes, procedures, and findings in the area of collective personality that support this research.

English et al. (2004) explored the relationship between group levels of conscientiousness and team performance in a group of airline pilot crews. In their exploration the authors sought to identify differences in correlations between team level measures of conscientiousness operationalized by use of a referent shifted measure and team level measures of conscientiousness operationalized through aggregation of individual level scores. In addition, the authors also explored the moderating effect of task type on team performance (English et al., 2004).

The authors found the construct of team conscientiousness operationalized at the team level using the team referent Team Conscientiousness Inventory (TCI) was significantly correlated to the Team Performance variable (English et al., 2004). In contrast, there was not a significant correlation between Team Conscientiousness and the Team Performance variable when the construct of team conscientiousness was operationalized using aggregate scores from the Summated Conscientiousness Scale (SCS) (English et al., 2004). In addition, the mean score for conscientiousness when operationalized at the group level and measured by the TCI was significantly greater than

the mean score of conscientiousness when operationalized as the aggregation of individual level group member scores on conscientiousness scores taken from the SCS (TCI mean=150.47, *SD*=10.30, SCS mean=117.47, *SD*=8.84) (English et al., 2004). This difference highlighted the potential importance of developing a way to quantify the construct of a group personality at the group level rather than the common approach of aggregation of individual level scores.

Though English et al. (2004) provided important information on potential differences in correlations between personality dimensions and group outcomes when personality dimensions are measured at a group level versus aggregating individual level scores, the research had limitations. Though a referent-shifted measure was used to develop the group-level measure of conscientiousness, the measure was administered only to in-group members. This use of the TCI exclusively with in-group members served as a limiting factor in that it required willing participation of team members that may not generalize to other types of teams or groups. Additionally, the research only addressed the personality dimension of conscientiousness with no information on other dimensions that may also moderate team performance. This limitation was clearly acknowledged by the authors in the discussion of results. When the authors described how the predictive utility of the group level measure of conscientiousness was found to be dependent on the task type and commented that “this study examined conscientiousness, and the predicted pattern of relationships received limited support” (English et al., 2004, p. 659). However, that pattern may not hold for other constructs. For example, “although conscientiousness



did not predict performance for conjunctive tasks, neuroticism might” (English et al., 2004, p. 659).

Although English et al., (2004) used a group level operationalization of one dimension of collective personality and fell within the literature search parameters, their research was not an exploration of collective personality dimensions. Rather, it was an exploration into differences in predictive utility of a single dimension of collective personality and the corresponding dimension of group personality as moderated by task types described by the Steiner 1972 task typology. Regardless of the outcome of the research, the primary hypothesis still rested on the a priori assumption that collective personality exists and has a structure that parallels that of individual personality.

Hofmann and Jones (2005) explored the relationship between types of leadership (transformational, transactional, and passive) and dimensions of collective personality with collective personality measured at the group level with a referent-shifted adjective checklist. The authors found positive correlations between transformational leadership and four dimensions of personality (Hofmann & Jones, 2005). Transactional leadership was not found to be significantly correlated to any of the identified personality dimensions and passive leadership was negatively correlated to some of the dimensions of collective personality (Hofmann & Jones, 2005).

What was important about this article in terms of my research was that, in contrast to other lines of research relating to the construct of collective personality, Hofmann and Jones (2005) was the only research found during the literature search that did not rest on the a priori assumption that the construct of individual personality generalizes to a

collective. Rather, in their research, Hofmann and Jones applied a lexical approach to quantifying the dimensions of collective personality. Hofmann and Jones used a referent shifted adaptation of an adjective-based measure of the Big Five personality dimensions to quantify the construct of collective personality. This use of an adjective checklist to establish the existence of a collective personality provided the foundation for the subsequent analysis of relationships between dimensions of collective personality identified through EFA, leadership style, and collective performance. The authors explored interaction effects of the personality dimensions on organizational performance and found that when collective conscientiousness and agreeableness were high, an increased level of openness led to less consistency of performance over time (Hofmann & Jones, 2005). This type of finding is important because it highlights the rationale for exploring all of the personality dimensions rather than the dimensional dyad of Agreeableness/Conscientiousness found in other research on collective personality like that of English et al. (2004).

Though the methods I used in my research parallel those used by Hofmann and Jones (2005) for quantifying dimensions of collective personality, there were limitations to use of the Hofmann and Jones adjective-based measure. In their method section the authors briefly discuss how they adapted Goldberg's 1992 adjective-based measure of the Big Five personality traits (Hofmann & Jones, 2005). They selected 10 adjectives balancing positive and negative valence words and, because participants were employees of a national fast-food chain, "asked individuals to rate the degree to which each of the adjectives described the character of their unit and the typical behavior in the store"

(Hofmann & Jones, 2005, p. 513). Analysis of the results indicated internal consistency reliability values were acceptable for all but one identified factor, emotional stability. The authors acknowledged that in research on the dimensional structure of individual personality, intercorrelations between all five dimensions of personality were acceptable when rated by others who knew the individual (Hofmann & Jones, 2005) but no such ratings were provided or explored in the authors' research. Like other research found in the literature search, the lack of data or ratings from nongroup members on group personality dimensions limits the results of the research to the within-group sample and makes generalization of the results outside the specific group or organizational context challenging.

Walumbwa et al. (2012) explored the relationship between ethical leadership and group in-role performance. Embedded within the research and particularly salient to this research was the authors' exploration of possible mediating role of group conscientiousness and group voice. The researchers measured ethical leadership as reported by the individual group members in groups of nurses. Group conscientiousness, group voice, as well as group in-role performance were also measured by supervisors of the groups. The authors used a temporally spaced-out data collection method to reduce consistency bias.

Importantly, the authors used an adjective-based measure of conscientiousness developed by Goldberg (1992) and adjusted by Hoffman and Jones (2005). Similar to earlier research leveraging the construct of collective personality dimensions, a referent shift was applied to the measure and individuals were asked to rate characteristics of the

group rather than individual members. Results of the research indicated ethical leadership was significantly and positively correlated with in-group performance (Walumbwa et al., 2012). Additional research hypotheses were also supported in that group conscientiousness and group voice both were found to moderate the relationship between ethical group leadership and in-group performance (Walumbwa et al., 2012).

Though Walumbwa et al. (2012) only addressed the modulatory role of a single dimension of collective personality on group performance, the implications for potential modulatory effects of other possible dimensions of collective personality were highlighted. The research of Walumbwa et al. (2012) clearly reflected the importance or utility of collective personality dimensions in understanding how to maximize the effectiveness of groups through use of a single group personality construct. However, the research contained the same limitations as other research utilizing the construct of collective personality. The authors assumed generalizability of the individual personality dimension to a collective and used only in-group members to quantify the group conscientiousness construct. In addition, the researchers highlighted a limitation in that the constructs of ethical leadership as well as the two mediating constructs of conscientiousness and group voice were measured from the same source, employees. This limitation illustrates how operationalizing a group personality through use of non-group member raters may have great utility and provide a means of mitigating this type of limitation.

Though there is little direct research on whether the construct of personality truly generalizes from individuals to collectives, the assumption that it does serves as the basis

for research into the way team composition impacts team performance or outcome. Frequently the construct of collective personality, though not named so, is leveraged as a viable means of predicting or understanding behavior of groups working in teams within an organizational context. Mathieu et al. (2014) highlighted this use in their review of team compositional models. In their review, the authors provided a summary of four models of team composition noting specifically the challenge that comes with integrating individual team member attributes as variables in the prediction of team outcome. Within their overview of various team composition models the authors emphasized what they refer to as a Team Profile Model which “advocates a collective perspective and advances various combinations of team compositional properties” (Mathieu et al., 2014, p. 139).

The Team Profile Model of team composition presented in Mathieu et al. (2014) is rooted in the process of combining the “knowledge, skills, abilities, and other characteristics (KSAO)” (p. 132) of individual team members to develop a group rating of KSAO that was useful in predicting team member performance or outcome. However, though the attempts to use team profile models indicate a general understanding within the field of the importance of collective level assessment of attributes, the methods for obtaining the collective level measures maintained the same limitations inherent in previously discussed lines of research. In these models the individual team member KSAOs were calculated and aggregated to a group level rating through the same types of aggregating processes used in other areas of research on personality and groups (Mathieu et al., 2014). Within the operationalization of KSAOs recognized as important components of team outcome in the team profile models, dimensions of personality fell

within the “O” category and represented only a portion of the model variables. However, Mathieu et al. (2014) clearly identified a utility of the collective approach to analyzing groups of people within an organizational context.

Similar to most of the limited results from the literature search strategy, Ogunfowora and Schmidt (2015) addressed the construct of collective personality as an adjunct concept or moderator of a primary research focus. The research provided information on the relationship between individual personality traits and collective personality traits over time, as well as the relationship between collective personality traits of Agreeableness, Emotional Stability, Conscientiousness, and the constructs of Social Loafing, Task Conflict, and Group Performance. In this research, individual personality characteristics were measured, participants were assigned to groups, and subsequent collective personality measures were calculated at different time intervals after the initial month of group formation. As with other research on collective personality, the group-level personality traits were calculated by using the aggregating process computing mean, standard deviation, maximum, and minimum scores for each of the measured personality factors. Additionally, and most salient to the current study, the authors operationalized collective personality at the group level using the same referent shifted measure and procedure as Hofmann and Jones (2005) and proposed that the construct of collective personality “should explain unique variance [in group level outcomes] over and above group personality and group ability composition” (Ogunfowora & Schmidt, 2015, p. 227).

One important finding of Ogunfowora and Schmidt (2015) related to the calculation of inter-case correlations (ICC) for each of the collective personality traits measured at the beginning of the study (T1) and subsequent re-administration of the referent shifted measure of collective personality at time intervals of T2 (one month after initial survey administration), T3 (two months after initial survey administration), and T4 (three months after initial survey administration). The internal consistency and reliability for these scales improved over time suggesting that the stability of the group personality improved the longer the group was together (Ogunfowora & Schmidt, 2015). However, the ICC value for T2 was lower than the recommended cut-off level. Authors speculated this might have been due to the relatively small group size. This speculation was important for my research in that it helped highlight the need to explore ways of operationalizing group personality without the use of group members.

In analyzing their data Ogunfowora and Schmidt (2015) found a five-factor model fit the data better than a four, three, or two factor model (Ogunfowora & Schmidt, 2015). In addition, and importantly, a five-factor model was most stable and deemed to be best assessed when groups had been together between two to three months and allowed to develop. Coefficients of stability values were stronger between time three (T3) and time four (T4) supporting research question one, that collective personality is temporarily consistent and becomes more stable over time (Ogunfowora & Schmidt, 2015). In addition, results of comparing group means for some group level personality traits suggested group personality composition variables influenced formation of collective personality traits.

Consistent with the previous research on the construct of collective personality, Bell et al. (2018) framed the construct of collective personality within the overarching context of research on team composition. The authors provided an overview of what was known about the impact of team composition on team outcome. Within this overview and the implied incorporation of a collective personality construct into the construct of team composition, the authors highlighted limitations in methodology I attempted to ameliorate in my research. For example, the authors described the aggregating process prevalent in much of the research on team composition. They outlined how the compositional process of aggregating individual personality scores to develop a group level score assumes isomorphism; “team members’ contributions are proportionate, and all team members’ attributes (e.g. scores on conscientiousness) are weighted equally” (Bell et al., 2018, p. 352). They also discussed the potential ways that individual team member attributes may interact thus altering the appropriateness of isomorphic operationalizations of group level attributes and creating a need for alternate operationalization. Though Bell et al. (2018) provided a general overview of current research on team composition, the incorporation of the construct of collective personality into this body of research underscored not only the utility of the construct of collective personality but the need to address limitations outlined by the study authors, and explore ways to operationalize the construct at a group level that is generalizable across multiple types of settings.

During my review of current literature on collective or group personality no studies were found that utilized a study sample drawn from a population of staff at



residential treatment facilities for adolescents. However, although my research sample was a convenience sample, the exploratory nature of the study coupled with the unique characteristics of residential treatment facilities made use of the population well suited to exploring group level operationalizations of the collective personality construct. Using staff at residential treatment facilities provided a natural way of controlling for aspects of collective personality like length of time since group formation, as well as frequency and intensity of group interactions previously identified as contributors to stability of collective personality (Ogunfowora & Schmidt, 2015). In the context of residential treatment facilities, these contributors to stability of collective personality are relatively static. The consistency of the environment in this type of setting allowed for the research question and hypothesis to be explored in a relatively controlled way in order to establish a foundation for later expansion into other, less controlled types of settings.

### **Summary and Conclusion**

There is no research directly exploring the construct of collective personality as a primary research focus. What is known is that individual member attributes contribute to the overall collective personality in different ways, at different times, and to differing degrees based on organizational context. Also known is that there are differences in correlations between group outcome/performance and group level personality profiles when profiles are operationalized as aggregates of individual level scores versus a collective level as measured by a referent shifted questionnaire. Additionally, the length of time since group formation plays a modulatory role in the stability of the collective personality construct.

The existing research on the construct of collective personality provides much support for the utility of the construct. Though the results of the literature search strategy provided information on correlations between dimensions of collective personality and group or organizational outcome, the existing research has significant limitations. Primary among these are the a priori assumption that the construct of personality generalizes to a group, the use of aggregation of individual level personality attributes to quantify group level personality, and the exclusive use of in-group raters as research participants. In my research I attempted to resolve the inherent limitations perpetuated in the current literature on collective personality by synthesizing the lexical approach used in development of the individual personality construct with the referent shifted procedures prevalent in the current literature on collective personality. The following chapter provides a detailed review of the procedures, instruments, and data analysis processes used to answer the research question and resolve some of the limitations in previous research on collective personality.

## Chapter 3: Research Method

### **Introduction**

The purpose of this research was to establish a foundation for the construct of collective personality by applying a lexical-based approach to categorizing behavioral traits or characteristics of groups at the group level through use of nongroup member rating of group characteristics. The following chapter provides a structured overview of the study. Major sections include descriptions of study variables, research design, and a description of how the design choice supports the advancement of knowledge in the area of collective personality. Additional sections of the chapter are categorized as follows: methodology, including sampling size; recruitment procedures; data collection procedures; instrumentation and operationalization of constructs; and data analysis plan. The chapter concludes with an overview of potential threats to validity as well as ethical procedures.

### **Variables, Research Design, and Choice**

There is very little research on the construct of collective personality. What research does exist rests on an a priori assumption that the construct of individual personality generalizes to a group. The existing research also relies on operationalizing collective personality by modifying existing individual personality measures to be used with groups. Though generalization of the individual personality construct to a group and the subsequent modification of individual personality measures to group application may have good face validity, there is no research in which procedures used to establish the foundation for the construct of modern personality structure have been applied to a group.

The design of the following research was an EFA. This approach addressed the research questions by replicating the lexical-based EFA procedures used to establish the foundation for modern individual personality structure with groups rather than individuals.

Because the research design was an EFA and was based on previous use of a lexical approach to identifying factor structure of individual personality, variables of the study paralleled those of other lexical studies. The research used Likert-scale ratings on 540 adjectives from the English language to describe characteristics or attributes of a group. These adjectives represented the observed variables of the EFA with individual factors of any resulting factor analysis representing the latent variables (see Appendix A for 540-term set). The specific 540 adjective list used in the research was developed by L. Goldberg at the Oregon Research Institute and was provided to me through correspondence with Dr. Goldberg. Referred to in EFA research on personality as Goldberg's 540 term set, the adjective list developed by Goldberg has served as a foundation for multiple lexical-base studies that support the modern five-factor individual personality structure (Saucier & Goldberg, 2001).

The research had several constraints inherent to the research design and related to the study setting. Because the study setting consisted of residential treatment facilities for children designated as severely emotionally disturbed, the research rested on finding facilities willing to participate in the research. Similarly, with research participants consisting of direct-care staff at the residential facilities, even within a participating facility effective execution of the research design was dependent on participation of

facility staff. One final constraint of the research related to the number of facilities that met the parameters for research setting. Though there were many residential treatment facilities that meet the parameters of the study setting outlined in this research, time and financial resources constrained the number of possible study sites to those within reasonable travel distance or those that were able to be contacted by phone.

## **Methodology**

### **Population**

The target population for this research was direct-care staff working at mental health residential treatment facilities for children and adolescents. The target population size was undefined. Direct-care staff at mental health residential treatment facilities were asked to voluntarily participate in the study and the sample size was a function of the number of volunteers.

### **Sampling and Sampling Procedures**

The research relied on a convenience sample of direct-care staff from residential treatment facilities for children and adolescents. Convenience sampling was chosen for this study because it was thought to allow for quick collection of a maximal amount of data from the study population. All staff who were familiar with at least one group of residents for a duration of at least 1 month were included in the sampling frame. Direct-care staff not familiar with at least one group of residents for at least 1 month were excluded from the samplings. Inclusion and exclusion criteria were based on the assumption that staff working directly with any group of residents for 1 month or longer

would likely have had enough interactions with their respective group(s) to provide a valid judgment of group characteristics.

Current literature recommends a minimum of between 50 to 3,000 participants ( $N = 50$  to 3,000) for accurate factor recovery. However, these minimum recommendations for EFA are often based on controlled research settings rather than field studies (de Winter et al., 2009), and obtaining the recommended number of participants is often not feasible for field studies. In contrast to literature on minimum sample size in EFA, de Winter et al. (2009) highlighted that valid results for EFA can be achieved in “well-conditioned data” (de Winter et al., 2009, p. 168) with sample sizes as low as 10 when the number of variables ( $p$ ) is high, factor loading ( $\lambda$ ) is high, and the number of factors ( $f$ ) is low. Because dependable factor analysis is based on a number of components of the analysis, mainly the number of variables ( $p$ ), factor loading ( $\lambda$ ), and number of factors ( $f$ ), there is no absolute minimum (de Winter et al., 2009). I chose Goldberg’s 540-term set as the primary measure in the study because it contains 540 response items or variables. This high number of variables was believed to increase the accuracy of factor extraction within a relatively small sample size such as was likely with the research. In addition, the ability to use on-line administration of the adjective checklist in the form of a survey eliminated time consuming data entry as well as limited the possibility of human error in the data entry process that may have compromised internal validity of the research. Given the high number of variables, assumed high factor loadings, and that the sample size for the research could be quite low and still produce valid results, I strove for a sample size minimum of 50 participants.

### **Procedures for Recruitment, Participation, and Data Collection**

I phoned administration staff of the six residential treatment facilities for children in the Sacramento area of California and inquired if the facility was willing to participate in a research study on collective personality. The study geographic area was expanded with approval from the Walden University Institutional Review Board (IRB) when not enough participating sites were found in the initial search area. I offered to meet in person with administrative staff of each facility contacted to provide an overview of the study and ask permission to solicit study participants from the facility direct-care staff. Due to the COVID-19 pandemic, in-person meetings were not preferred by any of the participating sites and correspondence was limited to phone and email. I explained that the data collected by the research survey did not include participant names and the individual responses of participants were not shared with the administration to protect the privacy of the research participants. Only direct-care staff at the group home were invited to participate in the research. If the facility administration agreed to participate in the study, I asked administration to complete the agreement to participate permission form and provided administrative staff with a call for participants flyer to distribute to direct-care staff at the facility. The flyer provided a brief overview of the research topic as well as a web address where direct-care staff who wished to participate could access the online informed consent form and research questionnaire through SurveyMonkey. The flyer also provided the URL of a web site where participants could view a summary of research results.

The first six questions of the research questionnaire required participants to provide demographic data including name and address of the facility for which they worked, length of time they had known residents, participant age, gender, highest level of education, and number of months they had known the group of residents with whom they work. With the exception of name and address of the facility for which the participants work, all other demographic response options were drop-down selections. Because employees at residential treatment facilities in California are required to be at least 18 years of age, options on the drop-down selection for the question on participant age began at age 18. The balance of the items on the research questionnaire consisted of the 540 descriptive adjectives on which the participants provided ratings on the degree to which the terms described the group with which they worked.

Because this research leveraged an electronic research questionnaire format, the exit procedure for the study was brief. At the conclusion of the electronic research questionnaire, participants received a notice on the screen thanking them for their time and participation. To mitigate potential for disclosure of any private health information of the residents at the facilities in which research participants worked, the survey was a forced response format with no “write in” options other than the name and address of the facility for which the participant worked. Questions about the research could be emailed directly to me at a university email address provided on the informed consent form.

### **Follow-up Procedures**

At the conclusion of the study, administration for each of the residential facilities that participated were contacted and provided an overview of the study results either in



person or in a letter depending on the preferences of the residential facility. In addition, the web site provided to participants on the call for participants flyer now includes a summary of research results that participants can access anonymously at their own convenience.

### **Instrumentation and Operationalization of Constructs**

Because the research was rooted in the lexical approach to understanding personality, the research instrument used in the study was appropriately reflective of the approach and consisted of a list of descriptive adjectives from the English language. Because the “primary criterion for the utility of factor markers is their ability to generate the target structure when the responses from large samples of individuals are factor analyzed” (L. R. Goldberg, p. 27, 1992), appropriateness of the instrument for this research was a function of previously demonstrated utility evidenced by factor congruence coefficients. Past research has demonstrated that analysis of the relationships between descriptive adjectives of indigenous languages regularly yields stable factor structure (L. R. Goldberg, 1990, 1992; Saucier & Goldberg, 2001) across multiple lists of variables. The list of variables used in the study was a set of 540 descriptive adjectives developed By L. Goldberg at the Oregon Research Institute and provided to me via direct correspondence.

Developed by refining previous lists of trait adjectives used in earlier studies on factor structure of personality (Saucier & Goldberg, 2001), the 540 terms set used in the research has demonstrated mean factor congruence coefficients between .86 and .94 in samples of self and peer ratings (L. R. Goldberg, 1990). In the research, this set of

descriptive adjectives was used to quantify the characteristics of groups with which the research participants are familiar. Goldberg's 540 term set has previously been used in lexical studies of personality structure leveraging university student self and peer ratings to demonstrate evidence of a five-factor personality structure (Saucier & Goldberg, 2001). My research replicated this approach using a referent shift in which the direct-care staff of residential treatment facilities for children designated as SED were asked to use Goldberg's 540 term set to rate the degree to which each of the terms describes the groups with which they work. Paralleling previous Likert scale rating descriptors used by Goldberg, the degree to which each of the 540 terms was descriptive of each respective group was measured on an eight-point Likert scale ranging from "extremely inaccurate to extremely accurate" (Goldberg, 1990, personal communication, 9/11/18). The rating process was estimated to take participants 45 minutes to complete. The resulting data was used as the basis for the subsequent EFA that was assumed to provide adequate data to answer the following research question: when a lexical approach is used to quantify collective personality at a group level through primary component analysis, how many factors will the resulting collective personality structure contain?

### **Data Analysis Plan**

The data analysis plan for the research consisted of three steps with each of the steps being carried out using IBM SPSS statistics software.

#### **Step 1**

During the first step of data analysis item responses to the 540-term forced choice questionnaire from all research participants were imported into SPSS software,

descriptive statistics calculated, and the survey data subjected to two separate procedures for assessing sample adequacy. SPSS was used to attempt calculation of a Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's test of sphericity with sampling adequacy assumed if the KMO value exceeds .50 and Bartlett's test of sphericity has a significance value of  $p < .05$ .

### **Step 2**

After sampling adequacy tests were attempted, SPSS was used to perform factor extraction using Principal Component Analysis (PCA). All factors with eigenvalues greater than one were retained.

### **Step 3**

In the final step of the data analysis plan, SPSS was used to attempt orthogonal varimax rotation to the extracted factors to maximize factor loading for further interpretation.

### **Threats to Validity**

The design and study setting were intended to minimize major threats to validity and reduce potentially intervening variables. However, threats still existed with most involving characteristics, qualities, or actions of the research participants and the research questionnaire. Because the research results were tied to respondents' answers on a self-administered survey, the largest threats to external validity were rooted in this administration method and the research questionnaire. Self-administration of the research questionnaire assumed respondents answered questions honestly and individually without the help or input of others.

The initial step in data analysis was intended to be integral in minimizing the abovementioned threat. The abovementioned dishonesty or random responses would likely result in inconsistent patterns within the correlation matrix produced during the factor extraction step of data analysis. Because this type of inconsistency in response pattern likely increased chances of sphericity, the application of the KMO and Bartlett's test of sphericity in the initial steps of the data analysis were the planned strategy to minimize this threat to validity. Dishonesty or random responses from a small number of participants were thought to be reflected as "noise" in the correlation matrix and, assuming sample adequacy, be managed through varimax factor rotation after principal component analysis.

One additional threat to validity related to the research questionnaire. The research questionnaire was comprised of 540 adjectives from the English language. Research participants were asked to use a Likert scale to rate the degree to which each of the adjectives described a group of children with which the research participants work. It was possible that some of the research participants did not know the definitions of some adjectives on the questionnaire. It was possible that respondents guessed or randomly selected responses for adjectives of which they did not know the definition. Similar to the strategy for managing dishonesty, the threat to validity from random responses or guesses from research participants was intended to be minimized through the use of KMO and Bartlett's test of sphericity. Random responses or guesses to questionnaire items by a high number of research participants were assumed to produce inconsistency in the correlation matrix resulting in KMO values less than 0.50 and significance values of  $p$

>.05 for Bartlett's test of sphericity. Random responses or guesses from a small number of participants were assumed to be reflected as "noise" in the correlation matrix and be mitigated through varimax factor rotation after principal component analysis.

### **Ethical Procedures**

Prior to the collection of data, and consistent with ethical standard 8.01 of the Ethical Principles of Psychologists and Code of Conduct, the research proposal was submitted to the IRB for approval. The IRB reviewed the proposal and approved it based on Walden University's ethical guidelines for research. The IRB approval number was 03-27-20-0316413 and expires March 26, 2021. Though this research was designed to minimize ethical considerations, there were several that had to be addressed through the site selection and data collection processes of this research.

The most salient ethical considerations for the research related to the study setting. Because the study design leveraged the unique attributes of residential treatment facility direct-care staffs' work environment to mitigate potentially intervening variables, study site permission and/or agreement to access participants was needed. To address this need, and prior to dissemination of instructions for participants to access the study research questionnaire, I obtained formal written permission from each participating site. Written permission specified the name of the research project, provided contact information for me as well as Walden University, and outlined the overall data collection procedures. In addition, to minimize the possible appearance of coercion, the only role of the administration staff of the participating facilities was to provide direct-care staff with a flyer inviting staff to participate in the research project. To eliminate any possibility of

administration staff at the participating facilities being able to track participants, all participant responses were anonymous and collected in an on-line survey with no IP addresses being collected.

Ethical considerations relating to privacy of the residents for each of the participating sites was also addressed. Though this research leveraged the unique attributes of residential treatment facility direct-care staffs' work environment to mitigate potentially intervening variables, protecting the privacy of residents at each participating site was paramount. The design of the data collection procedures and research questionnaire was intended to help maintain the privacy of residents at participating sites by limiting the opportunity for participants to inadvertently disclose information about individual residents with whom they work.

Procedures for accessing the online research questionnaire were disseminated to potential research participants by administrative staff of each participating research site via a call for participant flyer which administration provided to all direct-care staff at the facility. Site administrators were informed that, in order to protect the privacy of research participants, no participant names or IP addresses would be collected in the survey. In addition, and aside from demographic information on the participant completing the research questionnaire including facility for which the participant works, gender identity, length of time the participant has known the group with which they work, and education level, the research questionnaire was a forced selection questionnaire. This format eliminated the potential for "write in" answers that may have inadvertently disclose protected health information of the residents at the participating facilities. Research data

was saved in an electronic format and is kept in a locked safe at my office for a minimum of 5 years after completion of the study.

The demographic data collected on research participants was minimal. The data collection was anonymous, and I will not sell or otherwise distribute information gathered from research participants outside the context of the research and its publication. In addition, the informed consent procedures clearly outlined that participation was voluntary.

### **Summary**

In my research I sought to use a novel quantitative way to establish a foundation for the construct of collective personality. I leveraged a lexical-based approach in the form of a 540-term adjective questionnaire on which research participants used a Likert scale to rate behavioral traits or characteristics of a group with which they work. The resulting data was subjected to attempts to test for sample adequacy. Factor extraction procedures were conducted using primary component analysis. The results of the factor extraction process were used to try to answer the research question of whether a lexical approach can be used to identify collective personality structure of a small group by using non-group members to describe the group. Varimax factor rotation was attempted as part of the post-hoc analysis and refinement of any resulting factor structure in order to interpret results within the context of current knowledge and research on collective personality.

## Chapter 4: Results

### Introduction

Though the construct and five-factor structure of personality has been applied to groups for decades, there has been little research on the generalizability of this construct beyond the individual. Rather, there has been an a priori assumption that the factor structure established for individuals is applicable to groups. The following chapter presents research results of my attempt to use a lexical approach to identify an underlying personality structure of a group using nongroup members as raters of that group. The goal of the research was to answer the following question by identifying support for either the below null or research hypothesis.

**RQ:** When a lexical approach and factor analysis is applied to residential treatment facility staff's rating on the degree to which 540 trait adjectives describe the group of residents with which the staff work, how many latent variables will be identified?

**$H_0$ :** When factor analysis is applied to a Likert scale rating of 540 trait adjective descriptions of group characteristics, the analysis will not yield 5 factors.

**$H_1$ :** When factor analysis is applied to a Likert scale rating of 540 trait adjective descriptions of group characteristics, the analysis will yield exactly 5 factors.

The following chapter is organized into three sections. The first section describes data collection and presents a description of the timeframe in which I gathered research data, recruitment and response rates and baseline descriptive demographic statistics, and a description of the representativeness of the sample to the larger population. The second



section presents statistical analysis findings as well as post hoc analysis. The third section presents a summary of the data as it related to the research questions.

### **Data Collection**

I collected data for the research via an anonymous online survey between May 4, 2020, and September 19, 2020. It is important to note that this data collection took place during an unprecedented national pandemic, which adversely impacted the recruitment of participating facilities. The initial recruitment procedures specified that each of six residential treatment facilities for children in the Sacramento Area of California would be contacted by phone and that facilities agreeing to participate in the research would provide staff with a call for participants flyer containing instructions for accessing and completing the online research questionnaire. However, the recruitment procedure began as the state of California implemented a shelter-in-place order for resident and nonessential workers due to an outbreak of the COVID-19 virus. Although the residential treatment facilities initially contacted were classified as “essential” and continued providing services, five out of the six facilities declined to participate due to concerns that the survey might place additional stress on staff already struggling to adjust to new facility protocols and procedures required by the U.S. Centers for Disease Control and Prevention as a result of the COVID-19 outbreak.

Due to unsuccessful participating facility recruitment, I requested a change in procedures from the university IRB and sought to expand the recruitment geographic area. The request to extend the recruitment area to facilities in all of California was granted, and I contacted additional facilities outside the Sacramento Area. Of the

contacted facilities, a total of four facilities agreed to participate with two of the facilities having multiple locations and agreeing to distribute the call for participants flyer in all of their locations.

Though there was no way to know the total number of treatment facility staff who accessed the call for participants flyer, a total of 31 participants accessed the online survey. Despite a survey completion response rate of 48%, of the 15 respondents who completed the survey, four of the surveys were disregarded due to a high number of consecutive missing responses resulting in a final participant count of 11. The remaining 11 participant surveys also had some missing responses. However, these were minimal and addressed in the statistical analysis through substitution of the mean for missing items. Appendix B provides a detail of the 11 respondents' scores on all descriptive adjective survey items, the mean and standard deviation for each of those items, as well as a detail of the missing responses for which the mean was substituted.

The initial items on the research survey consisted of questions intended to collect data on the demographic characteristic of the research sample. Because the research leveraged the unique characteristics of the research setting to minimize the degree to which intervening variables might contribute to the development of any collective personality structure, the collected demographic data is informational and not intended to be representative of a larger population. Though this limits the generalizability of the results, the results of the research are intended to be exploratory and establish a foundation for the construct of collective personality that is missing in the current

literature. Generalization of any identified personality structure to a larger population is outside the scope of this research.

As shown in Table 1 and Table 2 respectively, the majority of the participants who completed research questionnaires were female with 63 percent cumulative having graduated from college. The education data is particularly useful in that it supports the underlying assumption that the majority of research participants likely understood the meaning of the adjectives used in the research survey.

**Table 1**

*Gender Demographic Data*

|        | Frequency | Percent | Valid percent | Cumulative percent |
|--------|-----------|---------|---------------|--------------------|
| Male   | 2         | 18.2    | 18.2          | 18.2               |
| Female | 9         | 81.8    | 81.8          | 100.0              |
| Total  | 11        | 100.0   | 100.0         |                    |

**Table 2**

*Level of Education*

|                            | Frequency | Percent | Valid percent | Cumulative percent |
|----------------------------|-----------|---------|---------------|--------------------|
| Graduated from high school | 1         | 9.1     | 9.1           | 9.1                |
| 1 year of college          | 2         | 18.2    | 18.2          | 27.3               |
| 2 years of college         | 1         | 9.1     | 9.1           | 36.4               |
| Graduated from college     | 5         | 45.5    | 45.5          | 81.8               |
| Completed graduate school  | 2         | 18.2    | 18.2          | 100.0              |
| Total                      | 11        | 100.0   | 100.0         |                    |

Additional demographic information relevant to the research related to the length of time each research participant has known the group they rated using the research

survey. The data collection procedures detailed in chapter three described omitting responses from research participants who had known the group they were rating for less than one month. This exclusion criterion was intended to ensure that respondents had enough interactions with the groups they rated to provide valid judgment of the degree to which each of the items on the research survey described the group. As illustrated in Table 3, none of the completed research surveys retained for possible analysis met this exclusion criterion.

**Table 3**

*Length of Time with Group*

|                 | Frequency | Percent | Valid percent | Cumulative percent |
|-----------------|-----------|---------|---------------|--------------------|
| One to 6 months | 4         | 36.4    | 36.4          | 36.4               |
| 6 to 12 months  | 1         | 9.1     | 9.1           | 45.5               |
| Over 2 years    | 6         | 54.5    | 54.5          | 100.0              |
| Total           | 11        | 100.0   | 100.0         |                    |

Because employees of residential treatment facilities are required to be 18 years or older, there was no exclusion criterion related to the age of research participants. As highlighted in Table 4, all research participants were between the age of 18 and 65 years old.

**Table 4***Participant Age*

|          | Frequency | Percent | Valid percent | Cumulative percent |
|----------|-----------|---------|---------------|--------------------|
| 18 to 24 | 1         | 9.1     | 9.1           | 9.1                |
| 25 to 34 | 4         | 36.4    | 36.4          | 45.5               |
| 35 to 44 | 2         | 18.2    | 18.2          | 63.6               |
| 45 to 54 | 3         | 27.3    | 27.3          | 90.9               |
| 55 to 64 | 1         | 9.1     | 9.1           | 100.0              |
| Total    | 11        | 100.0   | 100.0         |                    |

**Results**

Appendix B presents the mean and standard deviations for each of the 540 adjectives on which research participants rated the groups with which they work. As outlined in the methodology chapter, participant honesty in response was the primary threat to validity. I planned to use the KMO and Bartlett's test of sphericity to minimize this threat by identifying random responses as "noise" in the correlation matrix with any residual "noise" relating to randomness in responses being managed through varimax rotation of the extracted factors. However, during the data analysis, I was unable to run the KMO and Bartlett's test of sphericity run because the correlation matrix was determined to be not positive definite. In addition, subsequent varimax rotation was not complete after the standard default of 25 iterations. This inability to run the sampling adequacy tests outlined in the initial data analysis plan was likely a function of the very high variable to participant ratio. The full correlation matrix detailing correlations

between each of the 540 adjectives was too large to include in this document but is available from me upon request.

Though not being able to complete the sampling adequacy tests did not invalidate the data, it may have caused an unidentifiable variance inflation in components during the subsequent factor extraction process and made interpretation of the factor extraction results tentative. This inability to quantify any variance inflation necessitated post hoc examination of the component matrix with more narrow parameters on component correlation coefficients.

Results of the initial factor extraction yielded a total of 10 extracted factors. However, the inability to run sampling adequacy tests or quantify variance inflation in the data made it not possible to directly answer the research question from the SPSS output. Rather, it was more appropriate to use a post hoc analysis of the data in the component matrix to draw conclusions about the presence of an underlying factor structure as it related to the construct of collective personality and the research question. Table 5 provides details of initial eigenvalues and variances for each of the 10 extracted factors. Although factor extraction yielded 10 components that explained the majority of the total variance, because the factor solution was not able to be rotated to minimize associations between multiple factors, and it was not possible to quantify potential variance inflation due to no initial sampling adequacy tests, describing each of the individual factors was not appropriate. However, the unrotated factor solutions were useful in identifying the likely existence of undefined latent variables composing a collective personality structure.

**Table 5***Total Variance by Component*

| Component | Initial eigenvalues |               |              | Extraction sums of squared loadings |               |              |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|
|           | Total               | % of Variance | Cumulative % | Total                               | % of Variance | Cumulative % |
| 1         | 137.810             | 33.860        | 33.860       | 137.810                             | 33.860        | 33.860       |
| 2         | 55.081              | 13.533        | 47.393       | 55.081                              | 13.533        | 47.393       |
| 3         | 43.926              | 10.793        | 58.186       | 43.926                              | 10.793        | 58.186       |
| 4         | 35.821              | 8.801         | 66.987       | 35.821                              | 8.801         | 66.987       |
| 5         | 32.955              | 8.097         | 75.084       | 32.955                              | 8.097         | 75.084       |
| 6         | 27.333              | 6.716         | 81.800       | 27.333                              | 6.716         | 81.800       |
| 7         | 21.386              | 5.254         | 87.054       | 21.386                              | 5.254         | 87.054       |
| 8         | 20.192              | 4.961         | 92.016       | 20.192                              | 4.961         | 92.016       |
| 9         | 18.415              | 4.525         | 96.540       | 18.415                              | 4.525         | 96.540       |
| 10        | 14.081              | 3.460         | 100.000      | 14.081                              | 3.460         | 100.000      |

RQ: When a lexical approach and factor analysis is applied to residential treatment facility staffs' ratings on the degree to which 540 trait adjectives describe the group of residents with which the staff work, how many latent variables will be identified?

$H_0$ : When factor analysis is applied to a Likert scale rating of 540 trait adjective descriptions of group characteristics, the analysis will not yield 5 factors.

$H_1$ : When factor analysis is applied to a Likert scale rating of 540 trait adjective descriptions of group characteristics, the analysis will yield exactly 5 factors.

Appendix C presents the component matrix with component loadings for factors retained with eigenvalues greater than one. Because of the inability to run sampling adequacy tests or quantify variance inflation, a conservative approach to interpreting the data was taken and only component loadings with strong or extremely strong correlations

having  $\geq |.6|$  were considered in the post-hoc analysis. This approach to interpreting the research findings was based on my correspondence with Dr. J. de Winter (2020) whose work on EFA of with small sample sizes was identified during my literature review. Dr. de Winter was consulted on possible ways to manage or interpret factor extraction results when the SPSS matrix output was not positive definite. Though no specific procedures or recommendations were offered by Dr. de Winter, he commented to me that small sample EFA usually needs an exceedingly clean structure with very high factor loadings (J. de Winter, personal communication, September 25, 2020). Table 5 details the number of adjectives with component loadings  $\geq |.6|$ . Of the 10 extracted components, only five had more than 10 adjectives with loadings  $\geq |.6|$  and only six had percentages  $\geq 3\%$  suggesting the high likelihood of an underlying factor structure with fewer than 10 components. Components one through five account for 94% of the total number of items with loadings  $\geq |.6|$ . Components one through six account for 97% of the items with loadings  $\geq |.6|$ .

**Table 6**

*Adjective Loading Count and Percentage*

|                                                 | Component Number |       |      |      |      |      |      |       |    |       |
|-------------------------------------------------|------------------|-------|------|------|------|------|------|-------|----|-------|
|                                                 | 1                | 2     | 3    | 4    | 5    | 6    | 7    | 8     | 9  | 10    |
| Number of adjectives with loadings $\geq  .6 $  | 168              | 37    | 24   | 17   | 10   | 8    | 4    | 1     | 0  | 2     |
| % of total adjectives with loadings $\geq  .6 $ | 62.0%            | 13.7% | 8.9% | 6.3% | 3.7% | 3.0% | 1.5% | 0.40% | 0% | 0.73% |



### **Summary**

Although the research data and subsequent analysis did not directly answer the research question, it provided tentative support for the null hypothesis that when factor analysis is applied to a Likert scale rating of 540 trait adjective descriptions of group characteristics, the analysis will not yield five factors. Rather, the number of factors yielded may be more than five. These tentative findings contrasted the existing literature on collective personality that often employed five-factor personality measures with an a priori assumption that the construct of personality generalizes to groups while maintaining the same factor structure it demonstrates with individuals. Though my research did not provide definitive results supporting a specific collective personality factor structure, it did support that the construct of collective personality may differ structurally from the construct of individual personality.

## Chapter 5: Discussion Conclusion and Recommendations

### **Introduction**

The purpose of the research was to establish a foundation for the construct of collective personality through application of a lexical-based approach and an adjective checklist to identify latent variables of collective personality by categorizing behavioral trait adjectives or characteristics of groups at a group level rather than an individual level through use of nongroup members ratings of the trait adjectives. Results of the research support the possibility that a lexical approach can be used to quantify a collective personality. Additionally, the research tentatively provides support for the possibility that although the construct of collective personality may exist, it is possible that it demonstrates a structure different than that of the five-factor structure of individual personality.

### **Interpretation of the Findings**

In contrast to the current literature relating to collective personality that rests on the a priori assumption that the construct of personality generalizes to groups while maintaining the same factor structure it exhibits in individuals, the research provides support for the possibility that collective personality and individual personality differ structurally. Because the research reviewed was either based on the assumption that collective personality has a five-factor structure or used a referent shifted five-factor measure to quantify a specific dimension of collective personality, direct comparison of the current research findings with those of the reviewed literature is not possible. However, results of the current research are aligned with the general processes employed

by other research in which a lexical based approach was used to identify personality structure. As it relates to the existing literature on individual and collective personality, the current research leveraged the same validated list of descriptive adjectives used in previous research (Saucier & Goldberg, 2001), a referent shift administration of the adjective list congruent with other processes used to quantify personality dimensions (English et al., 2004; Hofmann & Jones, 2005), and address the possible inappropriateness of isomorphic operationalization of group level attributes highlighted by (Bell et al., 2018).

Though identifying the specific structure of collective personality was beyond the scope of this research, a conservative approach to interpreting the research data suggests that an underlying factor structure of collective personality may have more than five factors and less than 10. Despite challenges with the initial data collection and screening process, EFA yielded 10 factors. Examination of the variances accounted for by each factor and the subsequent post hoc examination of factor loadings with high or extremely high correlation coefficients suggested that although the results do not identify a specific factor structure, one likely exists and may have more than five components. These research findings are congruent with the conceptual framework of a lexical approach in which the assumption that important characteristics of individuals or groups are embedded into the natural lexicon of a culture. Lexical differences between how individuals and groups are described, or differences between the applicability of trait descriptors to individuals versus groups, could create categorical differences in any lexical based typology.

### **Limitations of the Study**

The primary limitation of the study related to the study setting. Because the study setting consisted of residential treatment facilities for groups of adolescents identified as severely emotionally disturbed, the research results may not necessarily generalize to other types of groups. A basis of the research is that the groups of adolescents for which each research participant provided ratings were functionally equivalent to the adult work groups in the literature on group and collective personality. However, given that no test for functional equivalence was conducted, the possible underlying factor structures of collective personality identified in the research may not be the same for different types of group compositions or contexts.

One additional and unanticipated limitation of the study was related to data collection and research participant recruitment. The research was conducted during a global pandemic, at a time in which much of the state where the research was conducted was under a shelter-in-place order, and when potential participating facilities expressed a reluctance to participate due to the perceived additional stress or burden on facility staff. This significantly reduced response rates resulted in exceedingly low participation. With  $N = 11$ , I interpreted the research findings tentatively and viewed the conclusions drawn from the data analysis as informative only in that they provide support for the need for additional exploration of the specific factor structure of collective personality.

### **Recommendations**

Because the results of the research were interpreted tentatively, recommendations for future research relate to more focused and expanded exploration of the construct of

collective personality. With research results providing tentative support for a null hypothesis that a lexical approach applied to groups to quantify a collective personality using nongroup members as raters will not yield five factors, future research should attempt to more clearly define the collective personality factor structure. Additionally, the limited sample size and specificity of the research setting informs on the need for future research to apply a similar lexical approach to other types of settings with a wider variety of research participants. Given that the construct of groups permeates so many domains and settings of society, the expansion of this research into those domains and settings could provide a much more solid foundation for the construct of collective personality and clarify if a structure of collective personality is stable across domains and settings.

### **Implications**

The construct of personality is used in many types of settings to understand, predict, and help guide/modify behavior of individuals. Generalization of the construct beyond individuals to groups has been done with the same purpose. Generalization of the construct and underlying structure of individual personality to groups has been important in understanding group interactions across a variety of domains and settings. Use of factor-based measures to quantify and research groups has been pivotal in attempts to predict behavior and understand group dynamics within these settings. The research findings, while not directly impacting the current use of the personality construct as it pertains to groups, do inform on possible ways to improve existing processes to quantify and understand group processes more accurately. The findings highlight that groups may exhibit a collective personality structure that is quantifiably different than that of an

individual. This possibility has social change implications across many areas. Paralleling the research trajectory of individual personality, identification and subsequent development of collective personality specific measures could serve as a catalyst for a new way of looking at the structure of small groups, predicting group behavior, or simply providing a better understanding of group dynamics. This type of social change implication is relevant to settings including but not limited to correctional institutes, educational institutes, organizational institutes, and any domain in which small groups exist.

### **Conclusion**

Attempting to understand human behavior at a group level is not a new endeavor. There is a wealth of literature that highlights the pragmatic applicability of the construct of personality to groups. The factor structure of individual personality has been usefully applied to groups for decades resulting in improved understanding of group behavior, processes, and dynamics across almost every imaginable social setting. Despite the pragmatism of generalizing the five-factor structure of individual personality to groups, there is no literature supporting the existence of a collective personality or, more specifically, a five-factor structure of collective personality. Rather, the generalization of the construct and structure has been an a priori assumption in almost all the research on groups and personality. The research presented above highlights that though the construct of collective personality likely exists and exhibits a factor structure, that structure may be quantifiably different than the five-factor structure of individual personality and

necessitate a shift in directions for future research into the intersection of group and personality construct.

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## Appendix A: Goldberg's 540-term Adjective Set

|               |               |                |
|---------------|---------------|----------------|
| Abrupt        | Boastful      | Contemplative  |
| Absent Minded | Boisterous    | Contemptuous   |
| Abusive       | Bold          | Controlling    |
| Accommodating | Bossy         | Conventional   |
| Acquiescent   | Brave         | Cooperative    |
| Acquisitional | Bright        | Cordial        |
| Active        | Brilliant     | Cosmopolitan   |
| Adaptable     | Bullheaded    | Courageous     |
| Adventurous   | Buoyant       | Courteous      |
| Affectionate  | Callous       | Cowardly       |
| Aggressive    | Candid        | Crabby         |
| Agreeable     | Cantankerous  | Crafty         |
| Aimless       | Carefree      | Cranky         |
| Alert         | Careful       | Creative       |
| Aloof         | Careless      | Critical       |
| Altruistic    | Casual        | Crude          |
| Ambitions     | Caustic       | Cruel          |
| Amiable       | Cautious      | Cultured       |
| Analytic      | Charitable    | Cunning        |
| Angry         | Cheerful      | Curious        |
| Animated      | Circumspect   | Curt           |
| Antagonistic  | Cleaver       | Cynical        |
| Anxious       | Coarse        | Daring         |
| Apathetic     | Cold          | Deceitful      |
| Argumentative | Combative     | Decisive       |
| Articulate    | Communicative | Deep           |
| Artistic      | Compassionate | Defensive      |
| Assertive     | Competitive   | Deliberate     |
| Assured       | Complex       | Demanding      |
| Astute        | Complaining   | Demonstrative  |
| Attractive    | Compulsive    | Dependable     |
| Austere       | Conceited     | Dependent      |
| Autocratic    | Conceitless   | Detached       |
| Autonomous    | Conciliatory  | Devil-May Care |
| Bashful       | Concise       | Devious        |
| Belligerent   | Condescending | Dignified      |
| Benevolent    | Confident     | Diplomatic     |
| Bigoted       | Conscientious | Direct         |
| Bitter        | Conservative  | Disagreeable   |
| Bland         | Considerate   | Discreet       |
| Blasé         | Consistent    | Dishonest      |

|               |                |                 |
|---------------|----------------|-----------------|
| Disordered    | Fidgety        | Idealistic      |
| Disorganized  | Finicky        | Ignorant        |
| Disrespectful | Firm           | Illogical       |
| Distrusting   | Flamboyant     | Ill-tempered    |
| Docile        | Flexible       | Imaginative     |
| Dogmatic      | Flippant       | Imitative       |
| Doleful       | Flirtatious    | Immature        |
| Dominant      | Folksy         | Immodest        |
| Domineering   | Foolhardy      | Impartial       |
| Down-to-earth | Forceful       | Impatient       |
| Dramatic      | Foresighted    | Imperceptive    |
| Dull          | Forgetful      | Impersonal      |
| Eager         | Formal         | Impertinent     |
| Earnest       | Forward        | Imperturbable   |
| Earthy        | Frank          | Impetuous       |
| Easy-Going    | Fretful        | Impolite        |
| Eccentric     | Friendly       | Impractical     |
| Economic      | Frivolous      | Impudent        |
| Effervescent  | Generous       | Impulsive       |
| Efficient     | Genial         | Inarticulate    |
| Egocentric    | Glib           | Inconsiderate   |
| Egotistical   | Glum           | Inconsistent    |
| Eloquent      | Gossipy        | Indecisive      |
| Emotional     | Greedy         | Indefatigable   |
| Empathetic    | Gregarious     | Independent     |
| Energetic     | Gruff          | Indirect        |
| Enterprising  | Grumpy         | Indiscreet      |
| Enthusiastic  | Guarded        | Individualistic |
| Envious       | Gullible       | Indulgent       |
| Erratic       | Haphazard      | Industrious     |
| Ethical       | Happy          | Inefficient     |
| Exacting      | Happy-go-Lucky | Informal        |
| Excitable     | Hard           | Informational   |
| Exhibitionist | Harsh          | Ingenious       |
| Explosive     | Hearty         | Inhibited       |
| Expressive    | Helpful        | Inner-directed  |
| Extravagant   | Helpless       | Innovative      |
| Extroverted   | High-Strung    | Inquisitive     |
| Exuberant     | Homespun       | Insecure        |
| Fair          | Honest         | Insensitive     |
| Fastidious    | Humble         | Insightful      |
| Faultfinding  | Humorless      | Insincere       |
| Fearful       | Humorous       | Intellectual    |
| Feminine      | Hypocritical   | Intelligent     |



|               |               |                |
|---------------|---------------|----------------|
| Intense       | Morose        | Precise        |
| Intolerable   | Naïve         | Predictable    |
| Introspective | Narrow-Minded | Prejudice      |
| Introverted   | Natural       | Pretentious    |
| Intrusive     | Neat          | Prideless      |
| Inventive     | Negativistic  | Principled     |
| Irreverent    | Negligent     | Progressive    |
| Irritable     | Nervous       | Prompt         |
| Jaded         | Nonchalant    | Proud          |
| Jealous       | Noncommittal  | Provincial     |
| Jovial        | Nonconforming | Prudish        |
| Joyless       | Nonpersistent | Punctual       |
| Judicious     | Nonreligious  | Purposeful     |
| Kind          | Nosey         | Quarrelsome    |
| Knowledgeable | Objective     | Quiet          |
| Lax           | Obliging      | Rambunctious   |
| Lazy          | Obsessive     | Rash           |
| Lenient       | Obstinate     | Rational       |
| Lethargic     | Open-Minded   | Reasonable     |
| Liberal       | Opinionated   | Rebellious     |
| Logical       | Opportunistic | Reckless       |
| Lonely        | Optimistic    | Refined        |
| Loyal         | Orderly       | Relaxed        |
| Lustful       | Organized     | Reliable       |
| Magnetic      | Outspoken     | Religious      |
| Malleable     | Particular    | Reserved       |
| Manipulative  | Passionate    | Respectful     |
| Mannerly      | Passionless   | Responsible    |
| Masculine     | Passive       | Restless       |
| Masochistic   | Patient       | Restrained     |
| Mature        | Patronizing   | Reverent       |
| Meddlesome    | Peaceful      | Rigid          |
| Meditative    | Perceptive    | Romantic       |
| Meek          | Persistent    | Rough          |
| Melancholy    | Pessimistic   | Rude           |
| Mercenary     | Philosophical | Ruthless       |
| Merry         | Placid        | Sarcastic      |
| Meticulous    | Playful       | Scatterbrained |
| Mischievous   | Pleasant      | Scornful       |
| Miserly       | Poised        | Scrupulous     |
| Modest        | Polite        | Seclusive      |
| Moody         | Pompous       | Secretive      |
| Moral         | Possessive    | Sedate         |
| Moralistic    | Practical     | Selfish        |

|                  |                 |                 |
|------------------|-----------------|-----------------|
| Selfless         | Strong          | Uncreative      |
| Sensitive        | Stubborn        | Uncritical      |
| Sensual          | Subjective      | Undemanding     |
| Sentimental      | Submissive      | Undependable    |
| Serious          | Suggestive      | Underhanded     |
| Servile          | Superstitious   | Understanding   |
| Sexy             | Surly           | Unemotional     |
| Shallow          | Suspicious      | Unenergetic     |
| Shortsighted     | Sympathetic     | Unenvious       |
| Shrewd           | Systematic      | Unexcitable     |
| Shy              | Tactful         | Unforgiving     |
| Silent           | Tactless        | Unfriendly      |
| Simple           | Talkative       | Ungracious      |
| Sincere          | Temperamental   | Unimaginative   |
| Skeptical        | Tempestuous     | Uninhibited     |
| Self-critical    | Tenacious       | Uninquisitive   |
| Self-disciplined | Terse           | Unintelligent   |
| Self-effacing    | Theatric        | Unintellectual  |
| Self-examining   | Thorough        | Unkind          |
| Self-indulgent   | Thoughtful      | Unmoralistic    |
| Self-pitying     | Thoughtless     | Unobservant     |
| Self-satisfying  | Thrifty         | Unpredictable   |
| Self-seeking     | Timid           | Unprejudiced    |
| Sloppy           | Tolerant        | Unpretentious   |
| Slothful         | Touchy          | Unprogressive   |
| Sluggish         | Tough           | Unreflective    |
| Sly              | Traditional     | Unreliable      |
| Smart            | Tranquil        | Unrestrainable  |
| Smug             | Transparent     | Unruly          |
| Snobbish         | Trustful        | Unscrupulous    |
| Sociable         | Truthful        | Unselfconscious |
| Social           | Unadventurous   | Unselfish       |
| Soft             | Unaffectionate  | Unsociable      |
| Soft-hearted     | Unaggressive    | Unsophisticated |
| Solicitous       | Unambitious     | Unstable        |
| Somber           | Unassuming      | Unsympathetic   |
| Sophisticated    | Unattractive    | Unsystematic    |
| Spirited         | Uncharitable    | Untalkative     |
| Spontaneous      | Uncommunicative | Unvindictive    |
| Steady           | Uncompetitive   | Urbane          |
| Stern            | Unconscientious | Vague           |
| Stingy           | Unconventional  | Vain            |
| Straight         | Uncooperative   | Verbal          |
| Strict           | Uncouth         | Verbose         |

Versatile  
Vibrant  
Vigilant  
Vigorous  
Vindictive  
Vivacious  
Volatile

Warm  
Wary  
Wasteful  
Weak  
Weariless  
Wise  
Wishy-washy

Withdrawn  
Witty  
Wordy  
Worldly  
Zealous  
Zestful

## Appendix B: Participant Response Item Detail

| Item Response Overview |        |                |                         |           |
|------------------------|--------|----------------|-------------------------|-----------|
|                        | Mean   | Std. Deviation | Analysis N <sup>a</sup> | Missing N |
| Abrupt                 | 5.7000 | 1.34536        | 11                      | 1         |
| Absent Minded          | 4.7273 | 1.27208        | 11                      | 0         |
| Abusive                | 5.6364 | 1.56670        | 11                      | 0         |
| Accommodating          | 3.8000 | 2.03961        | 11                      | 1         |
| Acquiescent            | 5.0000 | 1.54919        | 11                      | 1         |
| Acquisitional          | 5.5455 | 1.57249        | 11                      | 0         |
| Active                 | 6.3000 | 2.19317        | 11                      | 1         |
| Adaptable              | 4.7273 | 2.00454        | 11                      | 0         |
| Adventurous            | 5.8182 | 1.60114        | 11                      | 0         |
| Affectionate           | 4.8182 | 2.13627        | 11                      | 0         |
| Aggressive             | 6.8182 | .87386         | 11                      | 0         |
| Agreeable              | 3.7273 | 1.67874        | 11                      | 0         |
| Aimless                | 4.2727 | 1.73729        | 11                      | 0         |
| Alert                  | 5.2727 | 1.73729        | 11                      | 0         |
| Aloof                  | 5.0909 | 1.70027        | 11                      | 0         |
| Altruistic             | 4.7273 | 2.00454        | 11                      | 0         |
| Ambitions              | 4.6364 | 2.06265        | 11                      | 0         |
| Amiable                | 4.3000 | 1.55242        | 11                      | 1         |
| Analytic               | 4.3636 | 1.85864        | 11                      | 0         |
| Angry                  | 7.0000 | 1.18322        | 11                      | 0         |
| Animated               | 6.0000 | 1.26491        | 11                      | 0         |
| Antagonistic           | 5.8182 | 1.25045        | 11                      | 0         |
| Anxious                | 7.2727 | .46710         | 11                      | 0         |
| Apathetic              | 5.8182 | 1.40130        | 11                      | 0         |
| Argumentative          | 7.4545 | .68755         | 11                      | 0         |
| Articulate             | 5.6364 | 1.43337        | 11                      | 0         |
| Artistic               | 5.5455 | 1.21356        | 11                      | 0         |
| Assertive              | 5.3636 | 1.36182        | 11                      | 0         |
| Assured                | 4.0000 | 1.34164        | 11                      | 0         |
| Astute                 | 4.8182 | 1.47093        | 11                      | 0         |
| Attractive             | 4.9000 | 1.75784        | 11                      | 1         |
| Austere                | 4.1000 | 1.13578        | 11                      | 1         |
| Autocratic             | 4.9000 | 1.13578        | 11                      | 1         |
| Autonomous             | 4.4545 | .93420         | 11                      | 0         |

|               |        |         |    |   |
|---------------|--------|---------|----|---|
| Bashful       | 4.1818 | 1.60114 | 11 | 0 |
| Belligerent   | 5.7273 | 1.10371 | 11 | 0 |
| Benevolent    | 4.4000 | 1.35647 | 11 | 1 |
| Bigoted       | 4.5000 | 1.36015 | 11 | 1 |
| Bitter        | 6.0000 | 1.78885 | 11 | 0 |
| Bland         | 4.3000 | 2.36854 | 11 | 1 |
| Blasé         | 4.1818 | 1.53741 | 11 | 0 |
| Boastful      | 5.7273 | .78625  | 11 | 0 |
| Boisterous    | 5.7273 | 1.34840 | 11 | 0 |
| Bold          | 6.3636 | 1.28629 | 11 | 0 |
| Bossy         | 6.7273 | 1.10371 | 11 | 0 |
| Brave         | 6.3636 | 1.20605 | 11 | 0 |
| Bright        | 6.0000 | 1.41421 | 11 | 1 |
| Brilliant     | 5.5455 | 1.57249 | 11 | 0 |
| Bullheaded    | 6.5455 | 1.03573 | 11 | 0 |
| Buoyant       | 4.6364 | .92442  | 11 | 0 |
| Callous       | 5.0909 | 1.22103 | 11 | 0 |
| Candid        | 5.4545 | 1.36848 | 11 | 0 |
| Cantankerous  | 5.8182 | 1.16775 | 11 | 0 |
| Carefree      | 5.5455 | 1.69491 | 11 | 0 |
| Careful       | 3.9000 | 1.81384 | 11 | 1 |
| Careless      | 5.9091 | 1.30035 | 11 | 0 |
| Casual        | 5.4545 | 1.75292 | 11 | 0 |
| Caustic       | 4.6364 | 1.43337 | 11 | 0 |
| Cautious      | 4.6364 | 1.96330 | 11 | 0 |
| Charitable    | 3.2727 | 2.00454 | 11 | 0 |
| Cheerful      | 4.4545 | 2.01810 | 11 | 0 |
| Circumspect   | 4.2727 | 1.73729 | 11 | 0 |
| Cleaver       | 5.2727 | 1.84883 | 11 | 0 |
| Coarse        | 4.5455 | 1.43970 | 11 | 0 |
| Cold          | 4.7000 | 2.10000 | 11 | 1 |
| Combative     | 6.7273 | 1.10371 | 11 | 0 |
| Communicative | 5.1818 | 1.99089 | 11 | 0 |
| Compassionate | 4.2727 | 2.00454 | 11 | 0 |
| Competitive   | 6.1818 | 1.60114 | 11 | 0 |
| Complex       | 6.7273 | 1.19087 | 11 | 0 |
| Complaining   | 6.2727 | 1.95402 | 11 | 0 |
| Compulsive    | 6.4545 | 1.21356 | 11 | 0 |

|               |        |         |    |   |
|---------------|--------|---------|----|---|
| Conceited     | 4.2000 | 1.72047 | 11 | 1 |
| Conceitless   | 4.4545 | 1.36848 | 11 | 0 |
| Conciliatory  | 4.0000 | 1.61245 | 11 | 0 |
| Concise       | 4.1000 | 1.44568 | 11 | 1 |
| Condescending | 5.1818 | .60302  | 11 | 0 |
| Confident     | 4.1818 | 1.53741 | 11 | 0 |
| Conscientious | 5.0000 | 1.48324 | 11 | 0 |
| Conservative  | 3.3636 | 1.20605 | 11 | 0 |
| Considerate   | 3.6364 | 1.68954 | 11 | 0 |
| Consistent    | 3.5455 | 1.91644 | 11 | 0 |
| Contemplative | 4.0909 | 1.44600 | 11 | 0 |
| Contemptuous  | 5.0000 | .89443  | 11 | 0 |
| Controlling   | 6.0000 | 1.18322 | 11 | 0 |
| Conventional  | 4.3636 | 2.11058 | 11 | 0 |
| Cooperative   | 3.8182 | 1.88776 | 11 | 0 |
| Cordial       | 3.6364 | 1.28629 | 11 | 0 |
| Cosmopolitan  | 3.3000 | 1.61555 | 11 | 1 |
| Courageous    | 6.2000 | 1.40000 | 11 | 1 |
| Courteous     | 4.0000 | 1.73205 | 11 | 1 |
| Cowardly      | 2.8000 | 1.32665 | 11 | 1 |
| Crabby        | 5.9000 | 1.04403 | 11 | 1 |
| Crafty        | 6.0909 | 1.22103 | 11 | 0 |
| Cranky        | 5.8182 | 1.16775 | 11 | 0 |
| Creative      | 6.1818 | 1.16775 | 11 | 0 |
| Critical      | 5.7273 | 1.42063 | 11 | 0 |
| Crude         | 5.3000 | 2.00250 | 11 | 1 |
| Cruel         | 5.2000 | 1.77764 | 11 | 1 |
| Cultured      | 3.7273 | 1.55505 | 11 | 0 |
| Cunning       | 5.8182 | 1.16775 | 11 | 0 |
| Curious       | 6.2727 | 1.00905 | 11 | 0 |
| Curt          | 5.4545 | 1.21356 | 11 | 0 |
| Cynical       | 5.5000 | 1.36015 | 11 | 1 |
| Daring        | 6.0909 | 1.44600 | 11 | 0 |
| Deceitful     | 5.9091 | 1.64040 | 11 | 0 |
| Decisive      | 4.3636 | 1.85864 | 11 | 0 |
| Deep          | 5.0909 | 1.81409 | 11 | 0 |
| Defensive     | 6.1818 | 1.77866 | 11 | 0 |
| Deliberate    | 6.3636 | 1.36182 | 11 | 0 |

|                |        |         |    |   |
|----------------|--------|---------|----|---|
| Demanding      | 7.0909 | 1.13618 | 11 | 0 |
| Demonstrative  | 5.5455 | 1.69491 | 11 | 0 |
| Dependable     | 3.6364 | 2.01359 | 11 | 0 |
| Dependent      | 6.1818 | 1.32802 | 11 | 0 |
| Detached       | 5.6364 | 1.68954 | 11 | 0 |
| Devil-May Care | 4.9091 | 1.64040 | 11 | 0 |
| Devious        | 5.1818 | 1.99089 | 11 | 0 |
| Dignified      | 4.0000 | 1.78885 | 11 | 0 |
| Diplomatic     | 3.3636 | 1.91169 | 11 | 0 |
| Direct         | 6.0000 | 1.34164 | 11 | 0 |
| Disagreeable   | 6.3636 | 1.28629 | 11 | 0 |
| Discreet       | 4.5000 | 1.50000 | 11 | 1 |
| Dishonest      | 6.0909 | .94388  | 11 | 0 |
| Disordered     | 5.7273 | 1.10371 | 11 | 0 |
| Disorganized   | 6.3000 | 1.00499 | 11 | 1 |
| Disrespectful  | 6.3636 | 1.02691 | 11 | 0 |
| Distrusting    | 6.0000 | 1.26491 | 11 | 0 |
| Docile         | 3.5455 | 1.91644 | 11 | 0 |
| Dogmatic       | 3.8182 | 1.53741 | 11 | 0 |
| Doleful        | 4.3636 | 1.43337 | 11 | 0 |
| Dominant       | 5.8182 | 1.47093 | 11 | 0 |
| Domineering    | 5.8182 | 1.53741 | 11 | 0 |
| Down-to-earth  | 4.2727 | 1.90215 | 11 | 0 |
| Dramatic       | 6.5455 | 1.36848 | 11 | 0 |
| Dull           | 2.5455 | 1.50756 | 11 | 0 |
| Eager          | 5.4545 | 1.57249 | 11 | 0 |
| Earnest        | 4.4545 | 1.57249 | 11 | 0 |
| Earthy         | 3.2727 | 1.48936 | 11 | 0 |
| Easy-Going     | 4.0909 | 1.81409 | 11 | 0 |
| Eccentric      | 5.0000 | 1.73205 | 11 | 0 |
| Economic       | 3.6364 | 1.80404 | 11 | 0 |
| Effervescent   | 4.6364 | 1.43337 | 11 | 0 |
| Efficient      | 3.7273 | 2.10195 | 11 | 0 |
| Egocentric     | 5.0000 | 1.67332 | 11 | 0 |
| Egotistical    | 4.8000 | 1.46969 | 11 | 1 |
| Eloquent       | 3.4545 | 1.43970 | 11 | 0 |
| Emotional      | 6.7273 | 1.48936 | 11 | 0 |
| Empathetic     | 4.6364 | 1.74773 | 11 | 0 |

|               |        |         |    |   |
|---------------|--------|---------|----|---|
| Energetic     | 6.7273 | 1.84883 | 11 | 0 |
| Enterprising  | 4.1818 | 1.88776 | 11 | 0 |
| Enthusiastic  | 5.5455 | 1.96792 | 11 | 0 |
| Envious       | 5.2727 | 1.90215 | 11 | 0 |
| Erratic       | 6.0909 | 1.44600 | 11 | 0 |
| Ethical       | 3.1818 | 1.25045 | 11 | 0 |
| Exacting      | 4.2727 | 1.48936 | 11 | 0 |
| Excitable     | 5.8182 | 1.88776 | 11 | 0 |
| Exhibitionist | 4.9091 | 1.75810 | 11 | 0 |
| Explosive     | 6.2727 | 1.79393 | 11 | 0 |
| Expressive    | 6.5455 | 1.21356 | 11 | 0 |
| Extravagant   | 3.8182 | 2.04050 | 11 | 0 |
| Extroverted   | 5.3636 | 2.06265 | 11 | 0 |
| Exuberant     | 5.0000 | 1.41421 | 11 | 1 |
| Fair          | 3.9091 | 1.86840 | 11 | 0 |
| Fastidious    | 3.9091 | 1.70027 | 11 | 0 |
| Faultfinding  | 5.8182 | 1.25045 | 11 | 0 |
| Fearful       | 5.3636 | 1.50151 | 11 | 0 |
| Feminine      | 3.5455 | 1.80907 | 11 | 0 |
| Fidgety       | 5.7273 | 1.10371 | 11 | 0 |
| Finicky       | 5.6364 | 1.36182 | 11 | 0 |
| Firm          | 5.2000 | 2.03961 | 11 | 1 |
| Flamboyant    | 3.4545 | 1.69491 | 11 | 0 |
| Flexible      | 3.5455 | 1.21356 | 11 | 0 |
| Flippant      | 4.8182 | 1.32802 | 11 | 0 |
| Flirtatious   | 5.2727 | 1.27208 | 11 | 0 |
| Folksy        | 3.3636 | 1.36182 | 11 | 0 |
| Foolhardy     | 4.8182 | 1.60114 | 11 | 0 |
| Forceful      | 5.6000 | 1.42829 | 11 | 1 |
| Foresighted   | 3.7273 | 1.84883 | 11 | 0 |
| Forgetful     | 5.0909 | 1.13618 | 11 | 0 |
| Formal        | 2.9091 | 1.64040 | 11 | 0 |
| Forward       | 5.5455 | 1.75292 | 11 | 0 |
| Frank         | 6.0909 | 1.13618 | 11 | 0 |
| Fretful       | 5.1818 | 1.25045 | 11 | 0 |
| Friendly      | 5.2727 | 1.84883 | 11 | 0 |
| Frivolous     | 4.7273 | 1.55505 | 11 | 0 |
| Generous      | 4.4545 | 1.86353 | 11 | 0 |



|                |        |         |    |   |
|----------------|--------|---------|----|---|
| Genial         | 4.0000 | 1.67332 | 11 | 1 |
| Glib           | 4.6364 | 1.43337 | 11 | 0 |
| Glum           | 4.9091 | 1.37510 | 11 | 0 |
| Gossipy        | 6.0000 | 1.48324 | 11 | 0 |
| Greedy         | 5.3636 | 1.50151 | 11 | 0 |
| Gregarious     | 4.4000 | 1.68523 | 11 | 1 |
| Gruff          | 4.5455 | 1.21356 | 11 | 0 |
| Grumpy         | 5.7273 | 1.67874 | 11 | 0 |
| Guarded        | 6.6364 | 1.20605 | 11 | 0 |
| Gullible       | 3.6364 | 1.50151 | 11 | 0 |
| Haphazard      | 5.1818 | 1.32802 | 11 | 0 |
| Happy          | 5.0000 | 2.19089 | 11 | 0 |
| Happy-go-Lucky | 3.9091 | 2.30020 | 11 | 0 |
| Hard           | 5.7273 | 1.61808 | 11 | 0 |
| Harsh          | 5.8182 | 1.32802 | 11 | 0 |
| Hearty         | 5.0909 | 1.92117 | 11 | 0 |
| Helpful        | 5.5455 | 1.69491 | 11 | 0 |
| Helpless       | 3.8182 | 1.53741 | 11 | 0 |
| High-Strung    | 5.4545 | 2.11488 | 11 | 0 |
| Homespun       | 4.4545 | 1.63485 | 11 | 0 |
| Honest         | 4.5455 | 1.69491 | 11 | 0 |
| Humble         | 3.7273 | 1.61808 | 11 | 0 |
| Humorless      | 3.4545 | 1.91644 | 11 | 0 |
| Humorous       | 6.1818 | 1.25045 | 11 | 0 |
| Hypocritical   | 5.1818 | .75076  | 11 | 0 |
| Idealistic     | 4.9091 | 1.75810 | 11 | 0 |
| Ignorant       | 4.0909 | 2.11918 | 11 | 0 |
| Illogical      | 5.1818 | 1.47093 | 11 | 0 |
| Ill-tempered   | 5.8182 | 1.60114 | 11 | 0 |
| Imaginative    | 6.0000 | 1.89737 | 11 | 0 |
| Imitative      | 5.2727 | 1.10371 | 11 | 0 |
| Immature       | 5.9091 | 2.07145 | 11 | 0 |
| Immodest       | 5.9091 | 1.37510 | 11 | 0 |
| Impartial      | 4.5455 | 1.91644 | 11 | 0 |
| Impatient      | 7.0909 | 1.04447 | 11 | 0 |
| Imperceptive   | 5.0909 | 1.57826 | 11 | 0 |
| Impersonal     | 4.6364 | 1.74773 | 11 | 0 |
| Impertinent    | 5.0909 | 1.57826 | 11 | 0 |

|                 |        |         |    |   |
|-----------------|--------|---------|----|---|
| Imperturbable   | 3.6364 | 1.96330 | 11 | 0 |
| Impetuous       | 5.6364 | 1.43337 | 11 | 0 |
| Impolite        | 5.8182 | 1.16775 | 11 | 0 |
| Impractical     | 5.5455 | 1.36848 | 11 | 0 |
| Impudent        | 5.1818 | 1.47093 | 11 | 0 |
| Impulsive       | 6.0909 | 1.30035 | 11 | 0 |
| Inarticulate    | 4.5000 | 1.74642 | 11 | 1 |
| Inconsiderate   | 5.8182 | 1.66242 | 11 | 0 |
| Inconsistent    | 5.6364 | 1.62928 | 11 | 0 |
| Indecisive      | 5.8000 | .97980  | 11 | 1 |
| Indefatigable   | 4.8182 | 1.40130 | 11 | 0 |
| Independent     | 4.9091 | 1.75810 | 11 | 0 |
| Indirect        | 5.1000 | 1.22066 | 11 | 1 |
| Indiscreet      | 5.3636 | 1.12006 | 11 | 0 |
| Individualistic | 4.8182 | 1.60114 | 11 | 0 |
| Indulgent       | 4.9091 | 1.44600 | 11 | 0 |
| Industrious     | 4.4545 | 1.63485 | 11 | 0 |
| Inefficient     | 4.3636 | 1.85864 | 11 | 0 |
| Informal        | 5.2727 | 1.55505 | 11 | 0 |
| Informational   | 4.5455 | 2.11488 | 11 | 0 |
| Ingenious       | 4.4545 | 1.69491 | 11 | 0 |
| Inhibited       | 5.4545 | 1.29334 | 11 | 0 |
| Inner-directed  | 4.7273 | 1.42063 | 11 | 0 |
| Innovative      | 4.6364 | 1.80404 | 11 | 0 |
| Inquisitive     | 5.4545 | 1.96792 | 11 | 0 |
| Insecure        | 6.4545 | 1.03573 | 11 | 0 |
| Insensitive     | 5.9091 | 1.70027 | 11 | 0 |
| Insightful      | 5.2727 | 1.84883 | 11 | 0 |
| Insincere       | 5.0909 | 1.81409 | 11 | 0 |
| Intellectual    | 4.7273 | 1.55505 | 11 | 0 |
| Intelligent     | 5.1818 | 1.72152 | 11 | 0 |
| Intense         | 6.0909 | 1.37510 | 11 | 0 |
| Intolerable     | 4.5455 | 2.42337 | 11 | 0 |
| Introspective   | 4.7273 | 2.00454 | 11 | 0 |
| Sentimental     | 4.7273 | 1.84883 | 11 | 0 |
| Serious         | 5.0000 | 1.78885 | 11 | 0 |
| Servile         | 4.1818 | 1.99089 | 11 | 0 |
| Sexy            | 1.6364 | 1.20605 | 11 | 0 |

|                  |        |         |    |   |
|------------------|--------|---------|----|---|
| Shallow          | 4.5455 | 1.75292 | 11 | 0 |
| Shortsighted     | 5.2727 | 1.48936 | 11 | 0 |
| Shrewd           | 4.8182 | 1.40130 | 11 | 0 |
| Shy              | 4.1818 | 1.83402 | 11 | 0 |
| Silent           | 3.1818 | 1.72152 | 11 | 0 |
| Simple           | 4.0000 | 1.89737 | 11 | 0 |
| Sincere          | 4.1818 | 1.25045 | 11 | 0 |
| Skeptical        | 5.0000 | 1.67332 | 11 | 0 |
| Self-critical    | 5.9091 | 1.81409 | 11 | 0 |
| Self-disciplined | 2.6364 | 1.28629 | 11 | 0 |
| Self-effacing    | 3.1000 | 1.37477 | 11 | 1 |
| Self-examining   | 4.0000 | 1.84391 | 11 | 0 |
| Self-indulgent   | 5.2727 | 1.42063 | 11 | 0 |
| Self-pitying     | 5.2727 | 1.79393 | 11 | 0 |
| Self-satisfying  | 4.3636 | 1.56670 | 11 | 0 |
| Self-seeking     | 4.6364 | 1.80404 | 11 | 0 |
| Sloppy           | 5.1818 | 1.77866 | 11 | 0 |
| Slothful         | 4.0909 | 1.57826 | 11 | 0 |
| Sluggish         | 4.5455 | 1.36848 | 11 | 0 |
| Sly              | 5.3636 | 1.28629 | 11 | 0 |
| Smart            | 6.1818 | 1.40130 | 11 | 0 |
| Smug             | 5.0000 | 1.00000 | 11 | 0 |
| Snobbish         | 4.6364 | 1.96330 | 11 | 0 |
| Sociable         | 5.5455 | 1.80907 | 11 | 0 |
| Social           | 5.4000 | 1.74356 | 11 | 1 |
| Soft             | 3.4545 | 1.50756 | 11 | 0 |
| Soft-hearted     | 4.9091 | 1.57826 | 11 | 0 |
| Solicitous       | 4.7000 | 1.55242 | 11 | 1 |
| Somber           | 3.6364 | 1.56670 | 11 | 0 |
| Sophisticated    | 3.1818 | 1.77866 | 11 | 0 |
| Spirited         | 4.9091 | 1.70027 | 11 | 0 |
| Spontaneous      | 5.9000 | 1.37477 | 11 | 1 |
| Steady           | 4.0000 | 1.67332 | 11 | 0 |
| Stern            | 3.8182 | 1.72152 | 11 | 0 |
| Stingy           | 5.0000 | 1.78885 | 11 | 0 |
| Straight         | 4.6364 | 1.62928 | 11 | 0 |
| Strict           | 3.4545 | 1.36848 | 11 | 0 |
| Strong           | 6.0909 | 1.64040 | 11 | 0 |

|                 |        |         |    |   |
|-----------------|--------|---------|----|---|
| Stubborn        | 7.1818 | .98165  | 11 | 0 |
| Subjective      | 6.4000 | 1.11355 | 11 | 1 |
| Submissive      | 4.0909 | 2.07145 | 11 | 0 |
| Suggestive      | 4.8182 | 1.94001 | 11 | 0 |
| Superstitious   | 3.2727 | 1.61808 | 11 | 0 |
| Surly           | 3.5455 | 1.43970 | 11 | 0 |
| Suspicious      | 5.3636 | 1.91169 | 11 | 0 |
| Sympathetic     | 4.6364 | 1.85864 | 11 | 0 |
| Systematic      | 4.7273 | 1.27208 | 11 | 0 |
| Tactful         | 5.2727 | 1.61808 | 11 | 0 |
| Tactless        | 4.0000 | 2.36643 | 11 | 0 |
| Talkative       | 6.2727 | 1.34840 | 11 | 0 |
| Temperamental   | 6.2727 | 1.95402 | 11 | 0 |
| Tempestuous     | 5.4545 | 1.63485 | 11 | 0 |
| Tenacious       | 5.5455 | 1.36848 | 11 | 0 |
| Terse           | 4.2727 | 1.42063 | 11 | 0 |
| Theatric        | 5.5455 | 1.29334 | 11 | 0 |
| Thorough        | 4.1818 | 1.66242 | 11 | 0 |
| Thoughtful      | 4.0000 | 1.94936 | 11 | 0 |
| Thoughtless     | 5.0000 | 1.34164 | 11 | 0 |
| Thrifty         | 3.3636 | 1.56670 | 11 | 0 |
| Timid           | 3.8182 | 2.08893 | 11 | 0 |
| Tolerant        | 3.7273 | 1.73729 | 11 | 0 |
| Touchy          | 5.0000 | 1.41421 | 11 | 0 |
| Tough           | 6.2000 | 1.24900 | 11 | 1 |
| Traditional     | 3.1818 | 1.47093 | 11 | 0 |
| Tranquil        | 3.2727 | 1.19087 | 11 | 0 |
| Transparent     | 3.4000 | 1.28062 | 11 | 1 |
| Trustful        | 3.3636 | 2.15744 | 11 | 0 |
| Truthful        | 3.1818 | 1.72152 | 11 | 0 |
| Unadventurous   | 3.6000 | 1.95959 | 11 | 1 |
| Unaffectionate  | 3.3636 | 1.43337 | 11 | 0 |
| Unaggressive    | 2.2727 | 1.27208 | 11 | 0 |
| Unambitious     | 4.5455 | 2.42337 | 11 | 0 |
| Unassuming      | 3.9091 | 1.92117 | 11 | 0 |
| Unattractive    | 3.0909 | 2.02260 | 11 | 0 |
| Uncharitable    | 4.0909 | 2.02260 | 11 | 0 |
| Uncommunicative | 3.4545 | 1.86353 | 11 | 0 |

|                 |        |         |    |   |
|-----------------|--------|---------|----|---|
| Uncompetitive   | 3.1818 | 2.08893 | 11 | 0 |
| Unconscientious | 4.3000 | 1.61555 | 11 | 1 |
| Unconventional  | 4.5000 | 1.56525 | 11 | 1 |
| Uncooperative   | 5.1818 | 1.99089 | 11 | 0 |
| Uncouth         | 3.7273 | 2.10195 | 11 | 0 |
| Uncreative      | 3.0909 | 1.97254 | 11 | 0 |
| Uncritical      | 3.0909 | 1.51357 | 11 | 0 |
| Undemanding     | 2.3636 | 1.20605 | 11 | 0 |
| Undependable    | 3.6364 | 2.15744 | 11 | 0 |
| Underhanded     | 4.5455 | 2.20743 | 11 | 0 |
| Understanding   | 4.0000 | 2.09762 | 11 | 0 |
| Unemotional     | 2.9091 | 2.02260 | 11 | 0 |
| Unenergetic     | 2.5455 | 1.57249 | 11 | 0 |
| Unenvious       | 2.7273 | 1.19087 | 11 | 0 |
| Unexcitable     | 2.4545 | 1.12815 | 11 | 0 |
| Unforgiving     | 4.0000 | 1.89737 | 11 | 0 |
| Unfriendly      | 3.5455 | 2.01810 | 11 | 0 |
| Ungracious      | 4.2727 | 2.14900 | 11 | 0 |
| Unimaginative   | 3.5455 | 2.06706 | 11 | 0 |
| Uninhibited     | 3.9091 | 1.97254 | 11 | 0 |
| Uninquisitive   | 3.4545 | 1.91644 | 11 | 0 |
| Unintelligent   | 3.3636 | 2.11058 | 11 | 0 |
| Unintellectual  | 3.0909 | 2.11918 | 11 | 0 |
| Unkind          | 4.1000 | 1.92094 | 11 | 1 |
| Unmoralistic    | 4.0000 | 2.04939 | 11 | 0 |
| Unobservant     | 4.0000 | 2.09762 | 11 | 0 |
| Unpredictable   | 4.4545 | 2.42337 | 11 | 0 |
| Unprejudiced    | 2.6000 | 1.20000 | 11 | 1 |
| Unpretentious   | 3.7273 | 1.73729 | 11 | 0 |
| Unprogressive   | 4.0000 | 1.89737 | 11 | 0 |
| Unreflective    | 4.0000 | 1.89737 | 11 | 0 |
| Unreliable      | 4.4545 | 1.86353 | 11 | 0 |
| Unrestrainable  | 3.4000 | 2.20000 | 11 | 1 |
| Unruly          | 4.1818 | 1.99089 | 11 | 0 |
| Unscrupulous    | 3.8182 | 1.72152 | 11 | 0 |
| Unselfconscious | 3.9091 | 1.97254 | 11 | 0 |
| Unselfish       | 3.3636 | 1.74773 | 11 | 0 |
| Unsociable      | 3.2727 | 2.05382 | 11 | 0 |

|                 |        |         |    |   |
|-----------------|--------|---------|----|---|
| Unsophisticated | 4.0909 | 1.37510 | 11 | 0 |
| Unstable        | 5.0909 | 2.07145 | 11 | 0 |
| Unsympathetic   | 4.2727 | 2.05382 | 11 | 0 |
| Unsystematic    | 3.8182 | 2.04050 | 11 | 0 |
| Untalkative     | 2.4545 | 1.43970 | 11 | 0 |
| Unvindictive    | 2.7273 | 1.42063 | 11 | 0 |
| Urbane          | 4.0000 | 2.19089 | 11 | 0 |
| Vague           | 4.2727 | 1.84883 | 11 | 0 |
| Vain            | 4.3636 | 1.91169 | 11 | 0 |
| Verbal          | 6.2727 | 1.19087 | 11 | 0 |
| Verbose         | 4.9000 | 1.13578 | 11 | 1 |
| Versatile       | 4.1818 | 1.83402 | 11 | 0 |
| Vibrant         | 4.4545 | 1.69491 | 11 | 0 |
| Vigilant        | 4.9091 | 1.86840 | 11 | 0 |
| Vigorous        | 5.0000 | 1.78885 | 11 | 0 |
| Vindictive      | 6.0909 | 1.22103 | 11 | 0 |
| Vivacious       | 4.3636 | 2.01359 | 11 | 0 |
| Volatile        | 5.9091 | 1.30035 | 11 | 0 |
| Warm            | 4.3636 | 2.01359 | 11 | 0 |
| Wary            | 5.8182 | 1.47093 | 11 | 0 |
| Wasteful        | 5.4545 | 1.50756 | 11 | 0 |
| Weak            | 2.8182 | 1.40130 | 11 | 0 |
| Weariless       | 4.5455 | 2.01810 | 11 | 0 |
| Wise            | 5.0000 | 1.09545 | 11 | 0 |
| Wishy-washy     | 5.3636 | 1.02691 | 11 | 0 |
| Withdrawn       | 5.6364 | 1.20605 | 11 | 0 |
| Witty           | 5.5455 | 1.57249 | 11 | 0 |
| Wordy           | 5.4000 | 1.74356 | 11 | 1 |
| Worldly         | 2.9091 | 1.70027 | 11 | 0 |
| Zealous         | 4.1818 | 2.31595 | 11 | 0 |
| Zestful         | 4.2727 | 2.32770 | 11 | 0 |

a. For each variable, missing values are replaced with the variable mean.

## Appendix C: Component Matrix

| Adjective     | Component     |               |               |              |        |        |               |        |        |        |
|---------------|---------------|---------------|---------------|--------------|--------|--------|---------------|--------|--------|--------|
|               | 1             | 2             | 3             | 4            | 5      | 6      | 7             | 8      | 9      | 10     |
| Abrupt        | 0.557         | -0.499        | -0.033        | -0.475       | -0.169 | 0.244  | -0.227        | 0.075  | -0.077 | 0.251  |
| Absent Minded | -0.181        | <b>-0.752</b> | 0.295         | 0.060        | 0.051  | 0.065  | -0.176        | 0.021  | 0.015  | 0.522  |
| Abusive       | 0.394         | -0.061        | -0.436        | 0.069        | 0.114  | 0.362  | 0.147         | 0.581  | 0.161  | 0.341  |
| Accommodating | <b>-0.665</b> | 0.253         | -0.253        | -0.330       | 0.474  | 0.222  | -0.033        | -0.013 | 0.109  | 0.183  |
| Acquiescent   | <b>0.679</b>  | 0.383         | 0.256         | -0.013       | 0.333  | -0.315 | 0.139         | -0.304 | 0.057  | 0.028  |
| Acquisitional | 0.384         | 0.296         | -0.206        | -0.313       | 0.562  | -0.006 | -0.452        | 0.190  | 0.250  | 0.073  |
| Active        | 0.145         | -0.019        | -0.469        | 0.560        | 0.436  | 0.265  | 0.234         | 0.344  | -0.052 | 0.091  |
| Adaptable     | <b>-0.640</b> | 0.504         | 0.226         | -0.189       | 0.348  | -0.264 | -0.190        | 0.097  | 0.107  | -0.034 |
| Adventurous   | -0.341        | 0.295         | <b>-0.602</b> | -0.394       | 0.187  | 0.348  | -0.012        | 0.082  | -0.294 | -0.172 |
| Affectionate  | <b>-0.671</b> | 0.413         | 0.175         | -0.219       | 0.496  | -0.013 | -0.162        | 0.063  | 0.078  | -0.136 |
| Aggressive    | 0.454         | 0.066         | 0.177         | <b>0.630</b> | 0.511  | -0.034 | -0.100        | 0.105  | 0.261  | -0.106 |
| Agreeable     | -0.570        | -0.459        | 0.433         | -0.241       | 0.196  | 0.066  | -0.202        | -0.083 | 0.347  | 0.094  |
| Aimless       | <b>0.614</b>  | -0.149        | 0.568         | -0.110       | 0.031  | 0.126  | -0.275        | -0.315 | -0.272 | 0.016  |
| Alert         | <b>-0.630</b> | 0.599         | 0.259         | -0.327       | 0.154  | -0.122 | -0.113        | 0.057  | -0.003 | -0.126 |
| Aloof         | 0.503         | 0.202         | -0.247        | 0.442        | 0.454  | -0.115 | -0.458        | 0.071  | 0.004  | 0.126  |
| Altruistic    | 0.531         | <b>0.732</b>  | 0.196         | -0.055       | 0.309  | 0.012  | -0.163        | -0.023 | -0.098 | 0.089  |
| Ambitions     | 0.392         | <b>0.633</b>  | -0.120        | -0.376       | 0.341  | 0.314  | 0.169         | -0.099 | 0.155  | 0.113  |
| Amiable       | <b>-0.752</b> | 0.528         | 0.145         | 0.158        | 0.200  | -0.139 | -0.139        | -0.019 | 0.099  | 0.146  |
| Analytic      | 0.547         | 0.392         | -0.098        | -0.141       | 0.459  | 0.233  | -0.150        | 0.398  | 0.175  | 0.202  |
| Angry         | 0.355         | 0.342         | -0.054        | 0.371        | -0.323 | -0.191 | <b>-0.675</b> | -0.049 | -0.112 | -0.072 |
| Animated      | 0.446         | <b>0.630</b>  | -0.197        | -0.482       | 0.190  | -0.095 | -0.191        | 0.054  | 0.215  | -0.041 |
| Antagonistic  | 0.488         | 0.257         | 0.267         | -0.327       | 0.442  | 0.103  | -0.273        | -0.420 | 0.225  | 0.101  |
| Anxious       | 0.466         | 0.039         | -0.003        | 0.571        | 0.014  | 0.533  | -0.380        | -0.096 | 0.089  | -0.100 |
| Apathetic     | <b>0.601</b>  | 0.404         | 0.171         | -0.147       | 0.168  | -0.214 | 0.115         | 0.350  | 0.242  | -0.394 |
| Argumentative | 0.394         | 0.227         | 0.408         | -0.412       | 0.080  | -0.294 | -0.378        | 0.122  | -0.451 | 0.050  |
| Articulate    | 0.456         | <b>0.718</b>  | -0.158        | 0.338        | 0.191  | 0.191  | -0.165        | -0.025 | 0.174  | 0.081  |
| Artistic      | <b>-0.773</b> | 0.343         | -0.171        | 0.018        | -0.340 | 0.273  | -0.132        | -0.038 | 0.162  | -0.144 |
| Assertive     | -0.343        | 0.346         | <b>-0.622</b> | 0.024        | 0.344  | 0.478  | 0.009         | -0.003 | 0.171  | -0.020 |
| Assured       | -0.581        | -0.218        | 0.187         | -0.569       | 0.061  | 0.458  | -0.159        | 0.027  | -0.062 | 0.115  |
| Astute        | -0.015        | 0.376         | 0.066         | -0.180       | -0.325 | 0.188  | <b>-0.666</b> | 0.015  | 0.195  | 0.446  |
| Attractive    | 0.529         | 0.035         | -0.140        | -0.541       | 0.477  | 0.026  | -0.034        | 0.392  | -0.112 | 0.104  |
| Austere       | 0.283         | 0.296         | 0.176         | <b>0.799</b> | 0.279  | -0.013 | 0.212         | 0.040  | 0.130  | 0.148  |

|               |               |              |               |        |              |        |        |        |        |              |
|---------------|---------------|--------------|---------------|--------|--------------|--------|--------|--------|--------|--------------|
| Autocratic    | 0.512         | 0.354        | 0.592         | 0.119  | -0.031       | -0.252 | 0.367  | 0.014  | -0.082 | -0.204       |
| Autonomous    | -0.059        | 0.087        | -0.333        | -0.171 | 0.496        | 0.317  | -0.277 | -0.385 | 0.010  | 0.527        |
| Bashful       | <b>-0.708</b> | 0.167        | 0.343         | -0.277 | -0.059       | 0.073  | -0.087 | -0.400 | 0.314  | -0.047       |
| Belligerent   | <b>0.654</b>  | 0.003        | -0.238        | 0.061  | -0.005       | -0.306 | -0.264 | -0.185 | 0.554  | -0.086       |
| Benevolent    | <b>-0.829</b> | 0.336        | 0.147         | 0.250  | 0.152        | -0.060 | -0.052 | 0.252  | -0.131 | 0.078        |
| Bigoted       | 0.502         | -0.209       | -0.109        | 0.273  | <b>0.710</b> | 0.314  | -0.027 | 0.099  | -0.038 | 0.060        |
| Bitter        | 0.513         | 0.376        | 0.430         | 0.451  | -0.178       | -0.002 | -0.161 | 0.160  | 0.187  | -0.297       |
| Bland         | <b>0.621</b>  | 0.198        | <b>0.653</b>  | -0.315 | -0.008       | 0.105  | -0.068 | -0.116 | -0.123 | 0.070        |
| Blasé         | 0.341         | 0.110        | <b>0.639</b>  | 0.176  | -0.521       | 0.183  | -0.076 | -0.073 | -0.227 | 0.255        |
| Boastful      | -0.352        | -0.104       | -0.168        | -0.531 | 0.080        | -0.408 | -0.049 | -0.574 | -0.034 | -0.223       |
| Boisterous    | 0.494         | <b>0.620</b> | -0.284        | -0.283 | -0.080       | 0.041  | 0.023  | 0.189  | 0.401  | -0.070       |
| Bold          | 0.324         | 0.551        | -0.477        | -0.202 | -0.378       | 0.174  | 0.047  | -0.372 | -0.044 | 0.086        |
| Bossy         | 0.420         | 0.325        | 0.137         | -0.136 | -0.277       | 0.037  | -0.234 | -0.312 | 0.355  | -0.570       |
| Brave         | 0.082         | 0.286        | <b>-0.686</b> | 0.036  | -0.443       | -0.045 | -0.203 | 0.038  | 0.439  | -0.072       |
| Bright        | -0.392        | 0.296        | <b>-0.644</b> | 0.052  | -0.355       | 0.288  | -0.043 | 0.105  | 0.165  | 0.304        |
| Brilliant     | -0.236        | 0.526        | -0.372        | 0.183  | -0.432       | 0.334  | -0.018 | 0.018  | 0.288  | 0.338        |
| Bullheaded    | 0.200         | 0.100        | -0.531        | 0.375  | -0.453       | -0.369 | 0.078  | -0.243 | -0.346 | -0.028       |
| Buoyant       | 0.006         | 0.319        | -0.131        | 0.019  | -0.124       | 0.109  | -0.523 | -0.337 | 0.074  | <b>0.679</b> |
| Callous       | <b>0.819</b>  | 0.294        | 0.119         | 0.162  | 0.002        | 0.172  | 0.240  | -0.238 | -0.214 | 0.113        |
| Candid        | 0.515         | 0.434        | -0.545        | 0.188  | -0.035       | 0.085  | -0.151 | 0.134  | -0.021 | 0.406        |
| Cantankerous  | 0.565         | 0.314        | -0.255        | 0.143  | -0.191       | 0.124  | 0.137  | -0.216 | 0.547  | -0.285       |
| Carefree      | 0.358         | 0.455        | -0.068        | 0.354  | 0.167        | 0.497  | 0.066  | -0.505 | -0.002 | -0.002       |
| Careful       | <b>-0.620</b> | 0.594        | -0.015        | 0.048  | 0.150        | -0.124 | -0.084 | -0.110 | 0.443  | -0.081       |
| Careless      | 0.394         | -0.031       | -0.372        | 0.144  | -0.163       | -0.438 | 0.329  | 0.004  | -0.546 | -0.245       |
| Casual        | <b>-0.840</b> | 0.362        | -0.076        | -0.216 | -0.179       | -0.267 | 0.014  | 0.051  | -0.051 | -0.045       |
| Caustic       | 0.003         | 0.534        | 0.576         | 0.063  | -0.488       | 0.157  | 0.306  | -0.020 | -0.135 | -0.066       |
| Cautious      | -0.576        | 0.485        | -0.027        | 0.126  | -0.178       | -0.430 | -0.221 | 0.250  | 0.290  | -0.065       |
| Charitable    | -0.472        | 0.383        | -0.082        | 0.060  | 0.415        | -0.094 | -0.119 | 0.476  | 0.414  | 0.164        |
| Cheerful      | <b>-0.677</b> | 0.486        | -0.086        | -0.178 | 0.261        | 0.045  | 0.201  | -0.245 | -0.258 | 0.169        |
| Circumspect   | -0.558        | <b>0.622</b> | 0.412         | -0.119 | -0.051       | -0.130 | 0.270  | 0.093  | 0.050  | -0.118       |
| Cleaver       | 0.555         | <b>0.658</b> | 0.057         | 0.112  | 0.007        | -0.351 | 0.038  | 0.252  | 0.228  | 0.061        |
| Coarse        | 0.488         | 0.433        | 0.450         | 0.193  | 0.136        | -0.232 | 0.328  | 0.127  | -0.362 | 0.088        |
| Cold          | <b>0.708</b>  | -0.088       | 0.548         | 0.017  | -0.276       | 0.006  | 0.025  | -0.041 | -0.332 | 0.032        |
| Combative     | 0.516         | 0.559        | 0.227         | -0.140 | -0.314       | -0.253 | -0.270 | -0.136 | -0.228 | -0.212       |
| Communicative | <b>-0.713</b> | 0.585        | 0.050         | -0.053 | -0.126       | -0.086 | -0.315 | -0.066 | -0.130 | 0.011        |
| Compassionate | <b>-0.637</b> | 0.590        | -0.012        | -0.219 | 0.286        | -0.078 | -0.173 | 0.076  | -0.037 | 0.269        |



|               |               |              |               |              |              |        |        |        |        |        |
|---------------|---------------|--------------|---------------|--------------|--------------|--------|--------|--------|--------|--------|
| Competitive   | <b>-0.848</b> | -0.006       | -0.075        | 0.085        | -0.325       | -0.090 | -0.015 | -0.144 | 0.033  | -0.364 |
| Complaining   | 0.235         | 0.153        | -0.120        | 0.206        | <b>0.775</b> | -0.403 | -0.216 | -0.203 | -0.094 | -0.065 |
| Complex       | 0.199         | 0.141        | <b>-0.876</b> | -0.081       | -0.240       | 0.101  | -0.007 | -0.303 | 0.048  | -0.067 |
| Compulsive    | 0.365         | 0.573        | 0.021         | -0.234       | 0.373        | 0.195  | -0.177 | 0.104  | 0.176  | -0.483 |
| Conceited     | -0.569        | -0.396       | 0.499         | -0.136       | -0.017       | 0.094  | 0.082  | -0.430 | -0.162 | -0.155 |
| Conceitless   | <b>0.805</b>  | 0.007        | 0.033         | -0.139       | 0.421        | 0.330  | 0.122  | 0.164  | 0.029  | 0.058  |
| Conciliatory  | -0.475        | 0.195        | 0.494         | 0.564        | -0.339       | -0.046 | 0.163  | -0.040 | -0.158 | 0.060  |
| Concise       | 0.309         | 0.071        | 0.531         | -0.075       | -0.553       | 0.520  | -0.062 | -0.118 | -0.127 | -0.054 |
| Condescending | 0.028         | 0.580        | -0.030        | 0.292        | -0.124       | -0.395 | 0.260  | 0.374  | -0.429 | 0.114  |
| Confident     | -0.573        | <b>0.656</b> | 0.094         | -0.146       | 0.313        | 0.189  | 0.030  | -0.237 | -0.135 | -0.051 |
| Conscientious | 0.526         | 0.382        | -0.200        | 0.140        | <b>0.614</b> | 0.014  | -0.124 | -0.140 | 0.304  | 0.114  |
| Conservative  | -0.004        | -0.375       | 0.310         | <b>0.654</b> | 0.247        | -0.232 | -0.360 | 0.287  | 0.028  | 0.090  |
| Considerate   | <b>-0.619</b> | -0.017       | 0.010         | 0.035        | 0.405        | -0.264 | -0.382 | 0.000  | 0.433  | 0.219  |
| Consistent    | -0.531        | 0.509        | -0.110        | 0.203        | 0.472        | 0.046  | 0.302  | 0.192  | 0.134  | -0.186 |
| Contemplative | <b>-0.676</b> | 0.258        | 0.240         | 0.077        | 0.343        | -0.466 | 0.052  | -0.115 | 0.050  | -0.246 |
| Contemptuous  | 0.217         | 0.401        | <b>0.700</b>  | 0.163        | 0.027        | -0.397 | -0.093 | 0.272  | -0.161 | -0.088 |
| Controlling   | <b>0.661</b>  | 0.400        | 0.046         | 0.361        | 0.015        | -0.390 | -0.015 | 0.102  | 0.215  | -0.249 |
| Conventional  | -0.533        | <b>0.682</b> | 0.305         | -0.074       | -0.071       | 0.191  | 0.199  | 0.066  | 0.192  | -0.173 |
| Cooperative   | -0.599        | -0.135       | -0.036        | 0.520        | 0.383        | 0.221  | 0.013  | 0.038  | 0.360  | -0.158 |
| Cordial       | <b>-0.689</b> | -0.187       | 0.503         | 0.257        | 0.280        | 0.211  | -0.178 | -0.012 | 0.128  | -0.012 |
| Cosmopolitan  | -0.417        | -0.488       | 0.558         | 0.229        | 0.282        | 0.052  | -0.283 | 0.194  | 0.148  | -0.036 |
| Courageous    | 0.128         | 0.451        | -0.375        | 0.171        | -0.401       | 0.010  | -0.396 | 0.089  | 0.533  | -0.024 |
| Courteous     | <b>-0.631</b> | 0.222        | 0.251         | -0.094       | 0.310        | -0.082 | -0.211 | 0.118  | 0.547  | -0.141 |
| Cowardly      | -0.386        | -0.360       | 0.476         | 0.066        | -0.325       | 0.448  | 0.402  | 0.053  | -0.029 | 0.135  |
| Crabby        | <b>0.770</b>  | 0.419        | 0.152         | 0.215        | -0.236       | -0.211 | -0.149 | -0.192 | -0.057 | 0.003  |
| Crafty        | 0.102         | 0.438        | <b>-0.696</b> | 0.343        | -0.156       | 0.385  | -0.049 | 0.121  | 0.075  | 0.011  |
| Cranky        | <b>0.657</b>  | 0.596        | -0.087        | -0.039       | -0.386       | -0.044 | 0.045  | 0.011  | 0.224  | -0.040 |
| Creative      | -0.417        | 0.506        | -0.518        | 0.234        | -0.410       | 0.223  | -0.062 | -0.021 | -0.158 | 0.016  |
| Critical      | 0.462         | <b>0.728</b> | -0.031        | -0.165       | 0.078        | 0.311  | 0.228  | -0.135 | 0.145  | -0.188 |
| Crude         | 0.440         | 0.591        | 0.175         | -0.137       | 0.030        | 0.262  | 0.402  | -0.341 | -0.244 | -0.019 |
| Cruel         | <b>0.634</b>  | 0.542        | 0.106         | 0.261        | -0.193       | -0.278 | 0.316  | 0.073  | 0.079  | 0.014  |
| Cultured      | -0.567        | -0.239       | <b>0.613</b>  | -0.066       | 0.024        | 0.436  | -0.057 | -0.139 | 0.051  | -0.159 |
| Cunning       | 0.543         | 0.416        | -0.477        | 0.275        | 0.169        | 0.207  | 0.035  | 0.172  | -0.320 | 0.154  |
| Curious       | 0.133         | 0.357        | -0.511        | 0.370        | 0.272        | 0.037  | 0.316  | -0.402 | -0.135 | -0.320 |
| Curt          | 0.396         | <b>0.758</b> | 0.231         | -0.344       | 0.062        | 0.118  | 0.021  | -0.254 | 0.100  | -0.064 |
| Cynical       | <b>0.634</b>  | 0.532        | 0.054         | -0.326       | 0.267        | -0.103 | 0.175  | 0.274  | 0.009  | -0.135 |

|                |               |              |              |              |              |               |        |        |        |        |
|----------------|---------------|--------------|--------------|--------------|--------------|---------------|--------|--------|--------|--------|
| Daring         | 0.304         | 0.508        | -0.578       | -0.121       | 0.009        | 0.421         | 0.021  | 0.242  | -0.224 | 0.116  |
| Deceitful      | 0.495         | 0.228        | -0.142       | -0.246       | 0.205        | <b>-0.621</b> | 0.229  | -0.005 | -0.368 | 0.085  |
| Decisive       | <b>-0.628</b> | <b>0.688</b> | 0.239        | -0.025       | 0.207        | -0.068        | 0.118  | -0.099 | -0.036 | 0.034  |
| Deep           | 0.435         | 0.432        | -0.558       | -0.016       | 0.039        | 0.167         | 0.465  | 0.198  | -0.054 | 0.159  |
| Defensive      | 0.276         | 0.303        | -0.444       | 0.339        | 0.196        | 0.385         | 0.201  | 0.456  | -0.250 | -0.151 |
| Deliberate     | 0.421         | 0.519        | -0.082       | <b>0.668</b> | -0.031       | -0.066        | -0.008 | -0.188 | 0.106  | -0.218 |
| Demanding      | 0.359         | 0.570        | 0.077        | 0.453        | -0.198       | -0.100        | -0.179 | -0.185 | -0.103 | -0.457 |
| Demonstrative  | 0.483         | <b>0.729</b> | 0.081        | 0.420        | 0.093        | 0.148         | 0.087  | 0.042  | 0.086  | -0.066 |
| Dependable     | -0.485        | 0.599        | 0.293        | -0.110       | 0.291        | 0.311         | 0.287  | 0.161  | 0.072  | -0.115 |
| Dependent      | 0.416         | <b>0.632</b> | -0.181       | 0.324        | 0.189        | -0.229        | -0.315 | -0.224 | -0.121 | 0.192  |
| Detached       | 0.523         | 0.440        | 0.230        | -0.185       | 0.480        | -0.294        | -0.066 | 0.318  | -0.035 | -0.148 |
| Devil-May Care | 0.545         | 0.281        | <b>0.713</b> | 0.034        | 0.196        | -0.072        | -0.099 | -0.202 | -0.130 | -0.053 |
| Devious        | 0.525         | <b>0.669</b> | 0.382        | 0.105        | 0.257        | -0.031        | 0.123  | -0.100 | -0.168 | 0.005  |
| Dignified      | <b>-0.606</b> | 0.502        | 0.259        | 0.002        | 0.257        | 0.384         | 0.053  | 0.200  | -0.232 | 0.059  |
| Diplomatic     | -0.415        | 0.065        | 0.478        | -0.131       | -0.020       | <b>0.633</b>  | -0.218 | 0.329  | -0.110 | 0.094  |
| Direct         | 0.405         | 0.557        | -0.512       | 0.411        | 0.016        | 0.049         | -0.102 | -0.033 | -0.130 | 0.251  |
| Disagreeable   | 0.515         | 0.479        | -0.054       | 0.376        | -0.565       | -0.100        | -0.149 | -0.039 | 0.075  | -0.053 |
| Discreet       | 0.250         | -0.191       | 0.429        | <b>0.682</b> | -0.347       | 0.245         | -0.138 | 0.067  | -0.189 | 0.102  |
| Dishonest      | <b>0.760</b>  | 0.120        | -0.183       | 0.348        | 0.074        | -0.258        | -0.028 | 0.133  | -0.397 | -0.074 |
| Disordered     | <b>0.741</b>  | -0.175       | -0.175       | 0.444        | 0.192        | -0.063        | -0.061 | 0.312  | -0.203 | -0.098 |
| Disorganized   | <b>0.630</b>  | -0.346       | -0.087       | 0.447        | 0.111        | 0.063         | -0.217 | 0.126  | -0.215 | -0.388 |
| Disrespectful  | 0.593         | 0.312        | -0.113       | 0.389        | 0.316        | -0.153        | 0.055  | 0.178  | -0.347 | -0.330 |
| Distrusting    | <b>0.607</b>  | 0.509        | -0.146       | -0.161       | -0.204       | -0.096        | 0.265  | 0.301  | -0.337 | -0.027 |
| Docile         | -0.283        | -0.208       | 0.557        | 0.504        | 0.052        | -0.506        | -0.171 | -0.049 | -0.037 | 0.148  |
| Dogmatic       | -0.510        | 0.383        | 0.558        | 0.007        | -0.410       | -0.027        | -0.184 | 0.023  | -0.019 | 0.281  |
| Doleful        | <b>-0.770</b> | 0.176        | 0.383        | 0.197        | 0.311        | 0.148         | -0.041 | 0.122  | -0.217 | -0.093 |
| Dominant       | 0.499         | <b>0.615</b> | 0.084        | 0.224        | -0.105       | -0.098        | -0.466 | -0.101 | 0.188  | 0.180  |
| Domineering    | 0.566         | <b>0.668</b> | 0.298        | -0.098       | -0.015       | -0.103        | -0.153 | 0.306  | 0.007  | -0.080 |
| Down-to-earth  | <b>-0.663</b> | <b>0.642</b> | 0.076        | -0.201       | 0.180        | 0.218         | 0.088  | 0.097  | 0.071  | 0.007  |
| Dramatic       | 0.350         | 0.551        | -0.019       | 0.509        | 0.181        | -0.206        | -0.340 | -0.340 | -0.079 | -0.033 |
| Dull           | -0.283        | -0.341       | <b>0.608</b> | 0.287        | 0.439        | 0.174         | 0.076  | 0.346  | 0.025  | 0.043  |
| Eager          | 0.392         | <b>0.712</b> | -0.213       | -0.338       | 0.172        | 0.344         | -0.050 | -0.036 | 0.110  | 0.128  |
| Earnest        | 0.432         | <b>0.602</b> | 0.034        | 0.147        | <b>0.600</b> | 0.127         | 0.096  | -0.075 | 0.157  | 0.110  |
| Earthy         | -0.436        | -0.060       | <b>0.771</b> | 0.237        | 0.226        | 0.212         | 0.014  | -0.122 | -0.204 | 0.058  |
| Easy-Going     | <b>-0.628</b> | 0.469        | 0.342        | -0.350       | 0.026        | 0.319         | -0.018 | -0.088 | 0.179  | -0.054 |
| Eccentric      | 0.466         | 0.270        | -0.299       | -0.071       | 0.491        | 0.264         | 0.000  | 0.245  | -0.392 | 0.301  |

|               |               |              |        |               |        |               |        |        |        |        |
|---------------|---------------|--------------|--------|---------------|--------|---------------|--------|--------|--------|--------|
| Economic      | -0.497        | 0.245        | 0.311  | 0.314         | 0.264  | -0.254        | 0.022  | -0.128 | 0.577  | -0.120 |
| Effervescent  | 0.023         | <b>0.904</b> | 0.045  | -0.249        | 0.135  | 0.068         | 0.198  | 0.120  | 0.189  | 0.079  |
| Efficient     | -0.436        | <b>0.700</b> | 0.346  | -0.161        | -0.117 | 0.265         | 0.268  | 0.051  | 0.121  | -0.030 |
| Egocentric    | 0.479         | -0.113       | -0.531 | 0.085         | 0.585  | -0.007        | 0.310  | 0.108  | -0.118 | 0.070  |
| Egotistical   | 0.417         | -0.460       | -0.162 | 0.185         | 0.456  | -0.100        | 0.187  | -0.527 | 0.141  | -0.053 |
| Eloquent      | <b>-0.680</b> | -0.093       | 0.002  | 0.448         | 0.310  | 0.430         | 0.174  | -0.051 | -0.015 | 0.116  |
| Emotional     | 0.305         | 0.260        | 0.093  | -0.496        | 0.476  | -0.198        | -0.233 | 0.054  | -0.474 | -0.192 |
| Empathetic    | <b>-0.733</b> | 0.300        | 0.093  | 0.253         | -0.095 | 0.051         | -0.478 | 0.058  | 0.153  | 0.184  |
| Energetic     | 0.094         | 0.199        | -0.526 | -0.138        | 0.287  | 0.511         | -0.051 | 0.394  | -0.375 | -0.118 |
| Enterprising  | -0.566        | 0.444        | 0.444  | 0.138         | 0.161  | 0.222         | -0.216 | 0.223  | 0.268  | -0.151 |
| Enthusiastic  | 0.232         | 0.371        | -0.587 | -0.209        | -0.018 | 0.515         | 0.310  | -0.138 | -0.125 | 0.152  |
| Envious       | <b>-0.781</b> | 0.209        | -0.141 | -0.478        | -0.139 | 0.005         | -0.021 | 0.236  | -0.152 | -0.006 |
| Erratic       | 0.447         | 0.288        | -0.341 | <b>-0.635</b> | -0.163 | -0.133        | 0.197  | 0.226  | -0.250 | 0.024  |
| Ethical       | <b>-0.682</b> | -0.069       | 0.171  | 0.279         | 0.286  | 0.036         | 0.015  | -0.235 | 0.504  | 0.171  |
| Exacting      | <b>-0.724</b> | 0.312        | 0.431  | -0.065        | 0.243  | 0.138         | -0.171 | 0.145  | -0.239 | 0.050  |
| Excitable     | <b>-0.840</b> | 0.362        | -0.067 | 0.010         | -0.130 | -0.060        | -0.140 | 0.240  | -0.242 | -0.045 |
| Exhibitionist | <b>0.603</b>  | 0.470        | 0.216  | 0.095         | -0.065 | 0.291         | 0.041  | 0.257  | 0.420  | -0.165 |
| Explosive     | 0.384         | 0.507        | 0.159  | -0.595        | 0.177  | -0.311        | 0.078  | 0.159  | -0.087 | -0.221 |
| Expressive    | 0.390         | <b>0.796</b> | 0.046  | 0.089         | 0.054  | 0.022         | -0.362 | -0.183 | -0.189 | -0.033 |
| Extravagant   | -0.519        | 0.462        | -0.081 | 0.420         | 0.223  | 0.031         | 0.521  | -0.109 | -0.004 | 0.008  |
| Extroverted   | <b>-0.754</b> | 0.160        | -0.069 | -0.432        | 0.032  | 0.246         | 0.135  | 0.221  | -0.193 | -0.219 |
| Exuberant     | 0.341         | 0.569        | -0.475 | -0.038        | 0.274  | -0.280        | 0.008  | -0.056 | 0.211  | 0.365  |
| Fair          | <b>-0.618</b> | 0.277        | -0.054 | 0.060         | 0.409  | -0.343        | 0.084  | -0.429 | 0.071  | 0.233  |
| Fastidious    | -0.579        | 0.264        | -0.063 | <b>0.601</b>  | -0.062 | -0.280        | 0.020  | -0.145 | 0.038  | 0.353  |
| Faultfinding  | <b>0.682</b>  | 0.319        | -0.024 | -0.089        | -0.539 | -0.278        | 0.114  | -0.202 | 0.007  | 0.064  |
| Fearful       | 0.026         | <b>0.697</b> | 0.098  | 0.107         | -0.025 | <b>-0.669</b> | 0.022  | 0.136  | -0.068 | 0.143  |
| Feminine      | -0.373        | 0.433        | 0.366  | 0.100         | -0.186 | -0.405        | 0.201  | -0.269 | -0.239 | 0.401  |
| Fidgety       | <b>0.629</b>  | 0.140        | -0.491 | -0.183        | 0.168  | -0.364        | 0.216  | -0.044 | 0.297  | -0.118 |
| Finicky       | 0.551         | 0.429        | -0.311 | -0.200        | 0.240  | -0.408        | 0.301  | 0.036  | 0.223  | -0.097 |
| Firm          | 0.459         | <b>0.710</b> | 0.121  | -0.164        | -0.134 | -0.104        | 0.222  | -0.372 | 0.122  | 0.108  |
| Flamboyant    | -0.291        | -0.017       | 0.247  | -0.160        | 0.589  | -0.265        | 0.271  | 0.271  | 0.443  | -0.261 |
| Flexible      | <b>-0.723</b> | 0.166        | 0.438  | -0.248        | 0.313  | -0.011        | -0.114 | -0.011 | -0.077 | 0.281  |
| Flippant      | <b>0.855</b>  | -0.037       | 0.012  | -0.289        | 0.090  | -0.067        | 0.136  | 0.343  | -0.136 | 0.130  |
| Flirtatious   | 0.483         | 0.326        | -0.076 | 0.434         | -0.347 | -0.016        | 0.368  | -0.452 | -0.008 | 0.076  |
| Folksy        | -0.520        | 0.346        | 0.326  | 0.242         | -0.306 | -0.126        | -0.149 | 0.094  | -0.010 | 0.552  |
| Foolhardy     | <b>0.791</b>  | 0.111        | 0.247  | -0.100        | -0.215 | 0.062         | 0.308  | 0.363  | 0.023  | -0.114 |

|                |               |              |               |        |               |               |        |        |        |        |
|----------------|---------------|--------------|---------------|--------|---------------|---------------|--------|--------|--------|--------|
| Forceful       | <b>0.674</b>  | 0.531        | 0.265         | 0.324  | -0.249        | 0.009         | 0.080  | -0.027 | -0.137 | 0.003  |
| Foresighted    | -0.542        | 0.460        | 0.219         | 0.238  | -0.088        | -0.066        | -0.207 | -0.377 | 0.329  | 0.292  |
| Forgetful      | 0.448         | 0.169        | -0.587        | 0.366  | 0.099         | 0.232         | -0.052 | 0.395  | 0.069  | 0.254  |
| Formal         | -0.428        | 0.075        | 0.222         | 0.365  | -0.353        | 0.510         | -0.001 | 0.049  | 0.456  | 0.182  |
| Forward        | 0.580         | 0.401        | 0.159         | 0.020  | -0.555        | 0.136         | 0.046  | 0.074  | -0.319 | 0.200  |
| Frank          | 0.531         | <b>0.616</b> | -0.198        | -0.236 | -0.343        | 0.316         | -0.108 | 0.108  | -0.059 | 0.009  |
| Fretful        | <b>0.679</b>  | 0.558        | -0.222        | -0.081 | 0.284         | 0.099         | 0.221  | 0.157  | 0.059  | 0.062  |
| Friendly       | <b>-0.846</b> | 0.268        | -0.181        | -0.138 | 0.282         | -0.157        | -0.017 | -0.011 | -0.235 | 0.028  |
| Frivolous      | 0.594         | 0.159        | -0.278        | 0.228  | 0.503         | -0.200        | -0.201 | -0.021 | 0.271  | 0.292  |
| Generous       | <b>-0.743</b> | 0.465        | -0.112        | -0.254 | 0.248         | -0.110        | -0.054 | -0.197 | 0.064  | 0.189  |
| Genial         | -0.545        | 0.594        | 0.283         | -0.152 | -0.428        | 0.035         | 0.145  | 0.124  | 0.048  | 0.155  |
| Glib           | <b>0.844</b>  | 0.319        | 0.131         | 0.020  | -0.062        | 0.060         | 0.321  | 0.214  | 0.106  | 0.026  |
| Glum           | <b>0.639</b>  | 0.407        | 0.174         | 0.212  | 0.010         | -0.490        | 0.307  | 0.119  | 0.017  | 0.046  |
| Gossipy        | 0.306         | 0.412        | -0.216        | 0.361  | -0.303        | <b>-0.634</b> | 0.132  | -0.153 | 0.158  | 0.021  |
| Greedy         | <b>0.638</b>  | 0.219        | -0.090        | -0.147 | -0.033        | -0.477        | 0.309  | -0.334 | -0.201 | 0.197  |
| Gregarious     | -0.561        | 0.492        | 0.304         | 0.131  | -0.202        | -0.396        | 0.313  | 0.069  | 0.146  | -0.112 |
| Gruff          | 0.234         | 0.580        | 0.426         | -0.254 | -0.494        | 0.052         | 0.262  | -0.080 | -0.101 | 0.176  |
| Grumpy         | 0.576         | 0.572        | 0.102         | 0.269  | -0.347        | -0.343        | 0.012  | 0.045  | -0.022 | 0.134  |
| Guarded        | 0.484         | 0.471        | -0.119        | -0.100 | -0.239        | -0.536        | 0.251  | -0.167 | -0.090 | -0.276 |
| Gullible       | -0.358        | -0.293       | 0.434         | -0.356 | 0.163         | -0.169        | -0.147 | -0.505 | -0.185 | 0.324  |
| Haphazard      | <b>0.809</b>  | -0.024       | -0.025        | -0.093 | -0.399        | -0.133        | -0.111 | 0.307  | -0.018 | 0.226  |
| Happy          | <b>-0.718</b> | 0.294        | -0.036        | -0.245 | 0.379         | -0.063        | 0.046  | -0.394 | -0.174 | 0.024  |
| Happy-go-Lucky | -0.538        | 0.502        | 0.007         | 0.174  | 0.449         | -0.071        | -0.007 | -0.368 | -0.090 | 0.279  |
| Hard           | 0.537         | <b>0.742</b> | 0.334         | 0.085  | -0.092        | 0.112         | 0.024  | -0.054 | -0.131 | -0.034 |
| Harsh          | <b>0.628</b>  | <b>0.722</b> | 0.174         | -0.025 | -0.187        | -0.049        | 0.031  | 0.061  | -0.112 | 0.002  |
| Hearty         | 0.320         | <b>0.842</b> | 0.275         | -0.197 | 0.068         | 0.052         | 0.093  | -0.226 | 0.046  | 0.064  |
| Helpful        | <b>-0.769</b> | 0.411        | 0.031         | -0.359 | 0.167         | -0.051        | -0.237 | -0.023 | 0.080  | -0.129 |
| Helpless       | -0.215        | 0.142        | 0.485         | -0.182 | 0.141         | -0.424        | 0.294  | 0.508  | -0.343 | 0.051  |
| High-Strung    | 0.561         | 0.142        | 0.161         | 0.119  | <b>-0.631</b> | 0.164         | 0.277  | 0.286  | -0.197 | -0.049 |
| Homespun       | <b>0.771</b>  | -0.076       | 0.225         | 0.340  | -0.166        | 0.217         | 0.246  | -0.286 | 0.129  | 0.012  |
| Honest         | <b>-0.747</b> | 0.172        | 0.266         | -0.486 | 0.041         | 0.158         | -0.191 | -0.174 | -0.101 | 0.051  |
| Humble         | -0.527        | 0.351        | 0.565         | -0.160 | 0.093         | -0.035        | -0.255 | -0.112 | -0.237 | 0.332  |
| Humorless      | <b>0.774</b>  | -0.227       | 0.231         | -0.223 | 0.176         | 0.391         | 0.038  | 0.161  | 0.148  | 0.115  |
| Humorous       | 0.354         | 0.230        | <b>-0.826</b> | -0.215 | 0.025         | -0.074        | 0.275  | -0.068 | -0.083 | 0.031  |
| Hypocritical   | -0.146        | -0.005       | -0.425        | -0.517 | 0.332         | -0.326        | 0.491  | -0.077 | -0.249 | -0.067 |
| Idealistic     | 0.501         | <b>0.623</b> | -0.202        | 0.072  | 0.244         | -0.060        | 0.321  | -0.308 | -0.008 | 0.231  |

|                 |               |              |        |              |              |              |        |        |        |        |
|-----------------|---------------|--------------|--------|--------------|--------------|--------------|--------|--------|--------|--------|
| Ignorant        | 0.461         | -0.027       | -0.055 | -0.057       | <b>0.722</b> | 0.435        | 0.111  | -0.175 | -0.128 | 0.101  |
| Illogical       | 0.569         | -0.038       | 0.437  | -0.241       | -0.061       | -0.228       | -0.369 | 0.253  | -0.361 | 0.197  |
| Ill-tempered    | 0.580         | 0.307        | 0.299  | -0.454       | -0.139       | -0.126       | -0.137 | 0.209  | -0.411 | 0.086  |
| Imaginative     | <b>-0.907</b> | 0.270        | -0.120 | 0.040        | -0.152       | -0.031       | -0.193 | -0.029 | -0.151 | -0.060 |
| Imitative       | 0.304         | 0.282        | 0.572  | 0.496        | 0.043        | 0.265        | 0.040  | -0.287 | -0.026 | -0.314 |
| Immature        | 0.392         | -0.339       | 0.015  | <b>0.643</b> | 0.353        | -0.191       | -0.012 | -0.188 | -0.337 | -0.089 |
| Immodest        | 0.526         | 0.038        | 0.134  | 0.133        | -0.341       | 0.377        | -0.441 | -0.297 | -0.327 | 0.194  |
| Impartial       | -0.457        | 0.303        | 0.542  | 0.470        | -0.246       | -0.021       | -0.008 | 0.303  | -0.024 | -0.175 |
| Impatient       | 0.278         | 0.176        | -0.250 | -0.480       | -0.077       | -0.236       | -0.527 | -0.324 | -0.377 | -0.109 |
| Imperceptive    | <b>0.632</b>  | 0.367        | 0.255  | 0.414        | 0.023        | 0.470        | 0.042  | -0.003 | -0.070 | -0.036 |
| Impersonal      | 0.552         | -0.083       | 0.320  | <b>0.613</b> | 0.261        | 0.068        | -0.074 | 0.300  | -0.204 | 0.006  |
| Impertinent     | <b>0.646</b>  | -0.250       | 0.378  | 0.212        | 0.318        | 0.345        | 0.003  | -0.071 | 0.045  | -0.325 |
| Imperturbable   | -0.353        | 0.257        | 0.587  | 0.446        | -0.193       | 0.051        | -0.372 | 0.023  | -0.071 | 0.285  |
| Impetuous       | 0.528         | -0.005       | 0.253  | -0.116       | 0.290        | 0.474        | 0.129  | -0.076 | 0.162  | -0.536 |
| Impolite        | <b>0.731</b>  | 0.147        | 0.289  | 0.246        | 0.222        | -0.032       | -0.080 | 0.009  | -0.486 | -0.085 |
| Impractical     | <b>0.736</b>  | -0.168       | 0.520  | 0.030        | -0.052       | 0.150        | -0.254 | 0.101  | -0.130 | -0.204 |
| Impudent        | <b>0.724</b>  | -0.300       | 0.251  | 0.080        | 0.068        | 0.292        | 0.059  | 0.353  | 0.010  | -0.314 |
| Impulsive       | 0.304         | 0.183        | -0.451 | -0.312       | 0.180        | <b>0.635</b> | 0.185  | -0.186 | -0.020 | -0.261 |
| Inarticulate    | <b>0.663</b>  | -0.327       | 0.447  | 0.040        | -0.195       | 0.079        | 0.162  | 0.313  | -0.284 | -0.052 |
| Inconsiderate   | 0.589         | -0.065       | 0.554  | -0.326       | -0.133       | 0.183        | -0.089 | 0.105  | -0.321 | -0.250 |
| Inconsistent    | <b>0.660</b>  | 0.232        | 0.571  | 0.074        | -0.220       | 0.118        | -0.028 | 0.107  | -0.288 | -0.145 |
| Indecisive      | <b>0.777</b>  | 0.114        | 0.163  | -0.053       | 0.203        | 0.341        | -0.195 | 0.163  | -0.316 | -0.178 |
| Indefatigable   | <b>0.698</b>  | 0.204        | 0.113  | -0.041       | -0.093       | 0.508        | -0.332 | -0.033 | 0.132  | 0.249  |
| Independent     | <b>-0.812</b> | 0.074        | -0.243 | 0.020        | -0.069       | -0.142       | -0.219 | 0.171  | 0.413  | -0.045 |
| Indirect        | <b>0.873</b>  | 0.119        | 0.336  | 0.225        | -0.001       | 0.206        | -0.040 | 0.031  | -0.121 | 0.011  |
| Indiscreet      | <b>0.669</b>  | -0.192       | -0.280 | 0.081        | 0.538        | 0.340        | -0.028 | 0.090  | 0.016  | -0.127 |
| Individualistic | <b>-0.899</b> | 0.302        | -0.153 | 0.017        | 0.145        | 0.114        | -0.070 | -0.042 | -0.153 | 0.112  |
| Indulgent       | <b>-0.918</b> | 0.060        | -0.055 | 0.026        | 0.069        | -0.017       | -0.120 | 0.346  | -0.069 | -0.079 |
| Industrious     | <b>-0.744</b> | 0.358        | 0.324  | -0.020       | -0.034       | 0.275        | 0.093  | -0.296 | 0.126  | -0.157 |
| Inefficient     | <b>0.627</b>  | -0.214       | 0.166  | 0.267        | 0.359        | 0.121        | -0.227 | -0.306 | -0.249 | 0.333  |
| Informal        | 0.486         | 0.212        | 0.065  | -0.257       | 0.257        | 0.416        | 0.055  | -0.530 | -0.329 | 0.130  |
| Informational   | -0.543        | <b>0.616</b> | 0.454  | -0.037       | -0.027       | 0.221        | 0.138  | -0.171 | -0.085 | -0.117 |
| Ingenious       | <b>-0.680</b> | 0.524        | 0.291  | 0.370        | 0.147        | -0.003       | -0.069 | 0.020  | 0.113  | -0.051 |
| Inhibited       | 0.576         | 0.143        | -0.076 | -0.280       | 0.266        | 0.331        | -0.508 | 0.312  | -0.057 | 0.157  |
| Inner-directed  | <b>0.654</b>  | 0.257        | 0.038  | -0.084       | 0.344        | <b>0.603</b> | 0.077  | -0.019 | 0.099  | -0.010 |
| Innovative      | <b>-0.641</b> | 0.558        | 0.208  | -0.112       | -0.120       | 0.181        | 0.159  | 0.349  | -0.143 | -0.081 |

|                  |               |        |               |               |              |               |        |        |        |              |
|------------------|---------------|--------|---------------|---------------|--------------|---------------|--------|--------|--------|--------------|
| Inquisitive      | <b>-0.812</b> | 0.365  | -0.061        | -0.431        | -0.019       | 0.014         | -0.069 | 0.036  | -0.093 | -0.047       |
| Insecure         | 0.555         | 0.351  | 0.086         | -0.110        | 0.259        | -0.502        | -0.396 | -0.096 | 0.021  | -0.251       |
| Insensitive      | 0.503         | 0.214  | 0.361         | -0.593        | 0.122        | -0.066        | -0.207 | 0.272  | -0.268 | -0.109       |
| Insightful       | <b>-0.770</b> | 0.505  | 0.191         | 0.032         | 0.005        | -0.211        | -0.226 | -0.101 | 0.084  | -0.040       |
| Insincere        | 0.552         | -0.183 | 0.026         | <b>0.674</b>  | 0.406        | -0.033        | -0.174 | 0.101  | -0.030 | 0.009        |
| Intellectual     | <b>-0.844</b> | 0.294  | -0.198        | 0.053         | 0.029        | 0.073         | 0.215  | 0.243  | -0.217 | 0.022        |
| Intelligent      | <b>-0.889</b> | -0.017 | -0.353        | 0.256         | 0.017        | -0.099        | 0.014  | -0.095 | -0.015 | -0.007       |
| Intense          | 0.557         | 0.092  | -0.201        | <b>0.628</b>  | -0.269       | -0.006        | 0.010  | 0.388  | -0.078 | -0.134       |
| Intolerable      | 0.493         | 0.425  | 0.476         | -0.002        | 0.475        | 0.153         | 0.063  | -0.160 | -0.266 | 0.026        |
| Introspective    | <b>-0.673</b> | 0.495  | 0.263         | -0.261        | 0.171        | 0.234         | -0.236 | 0.144  | 0.027  | -0.056       |
| Self-critical    | 0.026         | 0.312  | -0.124        | <b>-0.670</b> | 0.111        | <b>-0.646</b> | -0.066 | -0.024 | 0.027  | 0.050        |
| Self-disciplined | -0.433        | -0.358 | 0.501         | 0.171         | 0.562        | 0.048         | 0.195  | 0.028  | 0.207  | 0.073        |
| Self-effacing    | -0.541        | 0.391  | 0.021         | -0.050        | 0.116        | -0.278        | -0.002 | 0.236  | -0.014 | <b>0.636</b> |
| Self-examining   | 0.381         | 0.220  | 0.427         | 0.270         | <b>0.655</b> | -0.222        | 0.095  | -0.151 | 0.191  | -0.072       |
| Self-indulgent   | <b>0.656</b>  | 0.099  | 0.268         | -0.410        | 0.529        | -0.145        | -0.040 | -0.018 | -0.062 | -0.116       |
| Self-pitying     | <b>-0.805</b> | 0.064  | 0.001         | -0.093        | 0.041        | -0.460        | -0.120 | -0.277 | 0.162  | -0.089       |
| Self-satisfying  | <b>-0.786</b> | -0.083 | 0.036         | 0.221         | 0.086        | 0.307         | 0.302  | -0.320 | -0.038 | -0.167       |
| Self-seeking     | -0.504        | -0.240 | <b>0.643</b>  | 0.116         | 0.035        | -0.412        | -0.081 | -0.153 | -0.132 | -0.206       |
| Sentimental      | <b>-0.682</b> | 0.431  | 0.207         | -0.192        | 0.358        | -0.179        | -0.156 | 0.130  | -0.247 | 0.079        |
| Serious          | <b>-0.650</b> | 0.409  | 0.305         | 0.393         | 0.092        | -0.298        | -0.011 | 0.140  | -0.196 | -0.080       |
| Servile          | <b>0.610</b>  | 0.315  | 0.302         | -0.138        | 0.432        | 0.123         | -0.334 | 0.100  | -0.044 | 0.304        |
| Sexy             | -0.196        | -0.409 | 0.264         | -0.077        | 0.233        | 0.033         | 0.408  | 0.321  | 0.340  | 0.528        |
| Shallow          | <b>0.651</b>  | -0.368 | 0.005         | 0.172         | 0.591        | -0.199        | -0.045 | -0.005 | -0.088 | 0.110        |
| Shortsighted     | 0.576         | 0.088  | -0.175        | -0.021        | <b>0.630</b> | -0.220        | 0.249  | -0.055 | -0.339 | 0.067        |
| Shrewd           | <b>0.855</b>  | 0.122  | 0.426         | -0.161        | 0.113        | -0.155        | 0.006  | 0.007  | 0.096  | -0.017       |
| Shy              | -0.507        | -0.383 | 0.532         | -0.073        | -0.061       | 0.059         | -0.256 | -0.306 | -0.359 | 0.109        |
| Silent           | -0.383        | -0.177 | 0.382         | 0.568         | 0.319        | 0.254         | 0.093  | 0.155  | -0.368 | 0.140        |
| Simple           | <b>0.698</b>  | 0.062  | 0.381         | 0.247         | 0.439        | 0.138         | -0.003 | -0.278 | 0.007  | 0.116        |
| Sincere          | <b>-0.861</b> | -0.032 | 0.003         | 0.193         | 0.277        | -0.214        | -0.043 | 0.221  | -0.147 | 0.161        |
| Skeptical        | <b>-0.725</b> | 0.199  | 0.017         | 0.079         | 0.111        | -0.579        | 0.031  | 0.237  | -0.155 | -0.005       |
| Sloppy           | 0.498         | -0.284 | 0.223         | -0.481        | 0.427        | -0.079        | -0.322 | -0.309 | -0.035 | 0.034        |
| Slothful         | -0.569        | -0.186 | 0.550         | -0.198        | 0.259        | -0.322        | -0.339 | 0.091  | -0.068 | 0.031        |
| Sluggish         | <b>-0.825</b> | -0.129 | 0.269         | 0.231         | -0.231       | 0.070         | -0.321 | 0.081  | 0.092  | -0.019       |
| Sly              | -0.030        | 0.147  | 0.013         | <b>0.688</b>  | -0.497       | -0.030        | -0.397 | -0.093 | -0.093 | 0.286        |
| Smart            | -0.577        | 0.243  | <b>-0.615</b> | 0.082         | -0.440       | -0.021        | -0.044 | 0.119  | -0.104 | 0.039        |
| Smug             | 0.414         | -0.218 | 0.341         | 0.175         | -0.376       | <b>0.623</b>  | -0.170 | 0.175  | -0.209 | -0.030       |

|               |               |              |               |               |        |        |        |              |        |        |
|---------------|---------------|--------------|---------------|---------------|--------|--------|--------|--------------|--------|--------|
| Snobbish      | <b>0.623</b>  | -0.104       | 0.434         | 0.352         | -0.027 | 0.286  | 0.028  | -0.447       | -0.072 | -0.001 |
| Sociable      | <b>-0.881</b> | 0.130        | -0.316        | 0.160         | -0.097 | -0.258 | -0.026 | -0.044       | 0.043  | -0.037 |
| Social        | <b>-0.835</b> | 0.269        | -0.182        | 0.277         | -0.181 | -0.285 | 0.066  | -0.007       | 0.005  | -0.048 |
| Soft          | -0.540        | 0.319        | 0.371         | 0.341         | 0.402  | -0.045 | 0.305  | -0.186       | -0.204 | 0.143  |
| Soft-hearted  | <b>-0.854</b> | 0.266        | -0.153        | 0.311         | -0.248 | -0.064 | -0.015 | -0.020       | 0.108  | 0.043  |
| Solicitous    | <b>-0.820</b> | -0.227       | -0.023        | 0.297         | -0.136 | -0.086 | -0.037 | -0.274       | 0.264  | -0.123 |
| Somber        | -0.421        | 0.075        | 0.191         | 0.440         | -0.387 | -0.498 | -0.015 | 0.236        | 0.056  | 0.360  |
| Sophisticated | -0.375        | 0.112        | -0.045        | 0.458         | -0.121 | -0.132 | 0.152  | <b>0.605</b> | 0.452  | 0.093  |
| Spirited      | <b>-0.794</b> | 0.280        | -0.226        | -0.174        | 0.067  | -0.380 | 0.141  | 0.189        | 0.074  | -0.024 |
| Spontaneous   | 0.358         | 0.356        | <b>-0.632</b> | 0.125         | 0.319  | 0.331  | 0.140  | 0.306        | -0.021 | -0.076 |
| Steady        | <b>-0.612</b> | 0.364        | 0.379         | 0.164         | 0.439  | -0.039 | 0.217  | -0.254       | -0.119 | -0.051 |
| Stern         | -0.365        | -0.073       | 0.345         | 0.488         | -0.435 | 0.001  | 0.282  | 0.470        | -0.103 | -0.057 |
| Stingy        | 0.514         | 0.199        | 0.207         | 0.277         | -0.562 | -0.064 | 0.431  | -0.071       | 0.208  | -0.152 |
| Straight      | <b>-0.757</b> | -0.117       | -0.089        | -0.400        | -0.335 | 0.107  | 0.325  | -0.025       | -0.030 | -0.119 |
| Strict        | -0.558        | 0.211        | 0.458         | 0.081         | 0.160  | 0.342  | 0.397  | 0.296        | -0.194 | -0.047 |
| Strong        | 0.318         | 0.424        | -0.350        | <b>-0.707</b> | 0.090  | -0.111 | -0.088 | 0.249        | -0.031 | 0.073  |
| Stubborn      | 0.345         | <b>0.640</b> | 0.070         | -0.002        | -0.166 | -0.086 | -0.325 | -0.193       | -0.138 | -0.520 |
| Subjective    | 0.400         | 0.291        | -0.150        | 0.201         | 0.183  | 0.542  | -0.196 | 0.164        | 0.180  | -0.518 |
| Submissive    | 0.236         | -0.199       | 0.569         | 0.273         | 0.388  | -0.029 | -0.340 | 0.357        | 0.267  | -0.200 |
| Suggestive    | -0.536        | 0.302        | 0.472         | 0.350         | -0.211 | 0.191  | -0.098 | 0.356        | -0.194 | -0.144 |
| Superstitious | -0.495        | -0.351       | -0.127        | -0.466        | 0.040  | -0.009 | 0.551  | 0.085        | -0.234 | 0.176  |
| Surly         | -0.584        | -0.387       | -0.153        | -0.356        | -0.409 | -0.054 | 0.356  | 0.105        | 0.034  | 0.223  |
| Suspicious    | 0.503         | 0.323        | -0.016        | <b>0.750</b>  | 0.141  | -0.195 | 0.091  | 0.014        | 0.116  | -0.022 |
| Sympathetic   | <b>-0.741</b> | 0.242        | -0.105        | -0.575        | -0.011 | -0.090 | -0.037 | -0.052       | 0.189  | 0.045  |
| Systematic    | <b>0.833</b>  | 0.103        | -0.096        | -0.248        | -0.009 | -0.037 | 0.336  | -0.176       | 0.274  | 0.067  |
| Tactful       | 0.481         | 0.120        | -0.337        | 0.484         | -0.125 | 0.234  | 0.307  | -0.480       | 0.052  | 0.096  |
| Tactless      | -0.351        | 0.420        | <b>0.650</b>  | -0.325        | -0.022 | 0.194  | -0.239 | 0.214        | -0.167 | 0.048  |
| Talkative     | 0.333         | 0.133        | -0.127        | <b>-0.720</b> | 0.164  | 0.152  | -0.529 | -0.027       | -0.080 | 0.007  |
| Temperamental | 0.319         | -0.018       | -0.090        | <b>-0.804</b> | 0.052  | -0.453 | -0.080 | -0.084       | -0.152 | 0.014  |
| Tempestuous   | 0.580         | 0.271        | 0.570         | 0.011         | -0.053 | 0.388  | -0.257 | -0.173       | -0.086 | -0.094 |
| Tenacious     | 0.576         | <b>0.632</b> | -0.001        | 0.082         | 0.341  | -0.020 | -0.227 | 0.183        | -0.164 | 0.182  |
| Terse         | <b>-0.745</b> | 0.517        | 0.330         | 0.114         | 0.040  | 0.077  | 0.054  | 0.122        | -0.162 | 0.062  |
| Theatric      | 0.528         | 0.306        | 0.053         | -0.542        | 0.168  | 0.228  | -0.234 | -0.277       | 0.334  | -0.091 |
| Thorough      | <b>-0.724</b> | 0.398        | 0.066         | 0.001         | -0.052 | 0.534  | 0.051  | 0.148        | 0.026  | 0.013  |
| Thoughtful    | -0.592        | 0.325        | -0.260        | -0.012        | 0.492  | -0.309 | 0.205  | 0.264        | -0.041 | 0.154  |
| Thoughtless   | <b>0.840</b>  | 0.018        | 0.004         | 0.272         | -0.397 | -0.043 | 0.023  | 0.108        | 0.009  | 0.219  |

|                 |               |        |              |        |               |        |              |        |        |        |
|-----------------|---------------|--------|--------------|--------|---------------|--------|--------------|--------|--------|--------|
| Thrifty         | -0.495        | 0.497  | 0.327        | 0.236  | -0.331        | 0.318  | 0.283        | -0.050 | 0.182  | 0.139  |
| Timid           | <b>0.653</b>  | 0.093  | 0.268        | 0.293  | 0.007         | 0.598  | -0.009       | -0.041 | -0.072 | 0.206  |
| Tolerant        | -0.436        | -0.133 | <b>0.662</b> | -0.074 | 0.200         | -0.088 | -0.484       | 0.245  | -0.017 | 0.081  |
| Touchy          | <b>0.683</b>  | 0.110  | 0.225        | -0.268 | -0.209        | 0.473  | 0.035        | -0.308 | 0.181  | -0.041 |
| Tough           | 0.591         | 0.109  | 0.173        | -0.044 | <b>-0.625</b> | 0.035  | -0.422       | 0.028  | 0.155  | -0.112 |
| Traditional     | -0.421        | 0.308  | 0.593        | -0.048 | 0.132         | 0.129  | 0.556        | 0.038  | -0.171 | -0.019 |
| Tranquil        | <b>-0.629</b> | 0.241  | 0.456        | 0.177  | -0.082        | 0.331  | 0.401        | -0.047 | 0.159  | 0.054  |
| Transparent     | <b>-0.605</b> | 0.415  | 0.395        | -0.006 | 0.022         | -0.029 | 0.499        | -0.197 | 0.011  | 0.132  |
| Trustful        | -0.512        | -0.571 | -0.276       | 0.217  | 0.025         | 0.409  | 0.070        | -0.258 | 0.203  | 0.089  |
| Truthful        | -0.577        | -0.369 | -0.105       | -0.529 | 0.283         | 0.271  | 0.050        | 0.020  | 0.278  | 0.083  |
| Unadventurous   | <b>0.815</b>  | -0.173 | 0.461        | -0.167 | 0.057         | 0.042  | 0.032        | -0.088 | 0.214  | 0.081  |
| Unaffectionate  | -0.138        | -0.432 | 0.314        | 0.487  | -0.333        | -0.458 | 0.275        | 0.115  | 0.188  | 0.118  |
| Unaggressive    | -0.373        | -0.144 | 0.145        | 0.152  | 0.398         | 0.125  | <b>0.685</b> | 0.278  | 0.210  | 0.175  |
| Unambitious     | <b>0.638</b>  | -0.099 | 0.464        | -0.343 | -0.452        | -0.155 | -0.069       | 0.050  | 0.105  | 0.054  |
| Unassuming      | <b>0.789</b>  | -0.093 | 0.331        | -0.212 | -0.204        | -0.101 | 0.191        | -0.259 | 0.201  | 0.135  |
| Unattractive    | -0.285        | 0.087  | 0.407        | -0.074 | 0.220         | -0.498 | 0.387        | -0.507 | -0.096 | 0.169  |
| Uncharitable    | <b>0.714</b>  | -0.044 | 0.261        | -0.392 | -0.319        | 0.195  | 0.337        | -0.086 | -0.011 | 0.076  |
| Uncommunicative | <b>0.833</b>  | -0.250 | 0.080        | 0.077  | 0.165         | 0.069  | 0.419        | 0.003  | 0.122  | 0.096  |
| Uncompetitive   | <b>0.806</b>  | -0.017 | 0.145        | -0.036 | 0.205         | -0.070 | 0.299        | -0.006 | -0.209 | 0.384  |
| Unconscientious | <b>0.758</b>  | 0.042  | 0.230        | -0.335 | 0.012         | 0.458  | 0.212        | 0.013  | -0.028 | 0.050  |
| Unconventional  | <b>0.805</b>  | 0.390  | 0.281        | -0.088 | 0.029         | -0.086 | 0.056        | 0.156  | 0.268  | 0.079  |
| Uncooperative   | 0.589         | 0.266  | 0.081        | -0.382 | -0.302        | -0.486 | 0.213        | 0.125  | 0.204  | 0.020  |
| Uncouth         | <b>0.746</b>  | -0.153 | 0.183        | 0.084  | 0.274         | -0.406 | 0.299        | -0.103 | 0.188  | 0.061  |
| Uncreative      | <b>0.802</b>  | -0.216 | 0.050        | 0.155  | 0.249         | 0.095  | 0.319        | -0.106 | 0.274  | 0.161  |
| Uncritical      | -0.388        | 0.104  | 0.503        | -0.248 | -0.024        | -0.251 | 0.548        | -0.179 | 0.344  | -0.097 |
| Undemanding     | -0.409        | -0.089 | 0.203        | 0.002  | 0.266         | 0.213  | <b>0.708</b> | 0.302  | 0.216  | 0.170  |
| Undependable    | <b>0.755</b>  | -0.105 | 0.027        | -0.142 | -0.106        | -0.085 | 0.090        | 0.544  | 0.031  | 0.274  |
| Underhanded     | <b>0.609</b>  | 0.318  | 0.160        | -0.488 | -0.330        | -0.169 | 0.177        | 0.221  | 0.193  | 0.095  |
| Understanding   | -0.579        | 0.403  | 0.122        | -0.506 | 0.152         | 0.279  | 0.140        | 0.035  | 0.299  | -0.145 |
| Unemotional     | <b>0.820</b>  | 0.089  | 0.150        | -0.160 | -0.040        | 0.268  | 0.186        | 0.021  | 0.199  | 0.352  |
| Unenergetic     | -0.264        | 0.178  | 0.477        | -0.382 | -0.457        | 0.268  | 0.281        | 0.108  | -0.042 | 0.391  |
| Unenvious       | -0.426        | -0.136 | <b>0.774</b> | -0.035 | 0.222         | 0.201  | 0.265        | 0.083  | 0.176  | 0.040  |
| Unexcitable     | -0.371        | -0.317 | 0.533        | -0.002 | 0.173         | -0.085 | 0.591        | 0.020  | 0.262  | 0.147  |
| Unforgiving     | <b>0.833</b>  | -0.128 | 0.321        | -0.140 | -0.036        | -0.265 | 0.049        | 0.251  | 0.100  | 0.138  |
| Unfriendly      | <b>0.727</b>  | 0.150  | 0.180        | -0.118 | 0.136         | -0.207 | 0.184        | -0.330 | 0.395  | 0.205  |
| Ungracious      | <b>0.733</b>  | -0.114 | 0.355        | -0.343 | -0.250        | -0.284 | 0.161        | 0.148  | 0.118  | 0.020  |



|                 |               |              |              |        |               |        |        |        |        |        |
|-----------------|---------------|--------------|--------------|--------|---------------|--------|--------|--------|--------|--------|
| Unimaginative   | <b>0.739</b>  | -0.002       | 0.288        | -0.412 | -0.147        | 0.188  | 0.234  | -0.133 | 0.245  | 0.106  |
| Uninhibited     | <b>0.679</b>  | -0.152       | 0.182        | -0.545 | -0.079        | 0.102  | 0.138  | -0.299 | 0.190  | 0.154  |
| Uninquisitive   | <b>0.850</b>  | -0.118       | 0.234        | -0.108 | 0.024         | -0.217 | 0.089  | -0.007 | 0.293  | 0.236  |
| Unintellectual  | <b>0.656</b>  | -0.105       | 0.343        | 0.111  | 0.236         | -0.208 | 0.319  | -0.426 | 0.153  | 0.153  |
| Unintelligent   | <b>0.633</b>  | 0.036        | 0.474        | -0.260 | -0.116        | -0.011 | 0.262  | -0.380 | 0.270  | 0.076  |
| Unkind          | <b>0.794</b>  | -0.191       | 0.434        | 0.081  | 0.095         | -0.206 | 0.031  | 0.063  | 0.279  | -0.059 |
| Unmoralistic    | <b>0.790</b>  | -0.186       | 0.244        | -0.063 | -0.018        | -0.461 | 0.131  | 0.099  | 0.009  | 0.193  |
| Unobservant     | <b>0.743</b>  | -0.109       | 0.367        | -0.189 | -0.230        | -0.246 | 0.093  | -0.173 | 0.331  | 0.067  |
| Unpredictable   | 0.561         | -0.338       | 0.139        | 0.036  | 0.279         | -0.582 | -0.287 | 0.000  | 0.078  | 0.214  |
| Unprejudiced    | -0.514        | -0.560       | 0.099        | -0.106 | 0.252         | 0.163  | 0.435  | 0.063  | 0.300  | 0.166  |
| Unpretentious   | <b>0.850</b>  | -0.244       | 0.114        | -0.192 | -0.072        | 0.003  | 0.167  | 0.054  | 0.335  | 0.140  |
| Unprogressive   | <b>0.832</b>  | -0.223       | 0.160        | 0.037  | -0.089        | -0.346 | 0.171  | 0.169  | 0.010  | 0.212  |
| Unreflective    | <b>0.813</b>  | -0.112       | 0.267        | -0.144 | -0.204        | -0.049 | 0.043  | 0.350  | 0.241  | 0.084  |
| Unreliable      | <b>0.778</b>  | -0.260       | 0.245        | -0.195 | -0.176        | -0.231 | 0.048  | 0.352  | 0.133  | 0.013  |
| Unrestrainable  | <b>0.727</b>  | -0.049       | 0.098        | -0.121 | 0.015         | 0.172  | -0.008 | 0.577  | 0.236  | 0.166  |
| Unruly          | <b>0.680</b>  | -0.362       | 0.015        | -0.253 | -0.092        | -0.336 | -0.170 | 0.066  | 0.380  | 0.209  |
| Unscrupulous    | <b>0.885</b>  | -0.155       | 0.165        | -0.103 | -0.120        | -0.037 | 0.286  | 0.009  | -0.003 | 0.240  |
| Unselfconscious | <b>0.782</b>  | -0.082       | 0.231        | -0.288 | -0.325        | 0.017  | 0.148  | 0.202  | 0.257  | 0.098  |
| Unselfish       | -0.422        | 0.003        | <b>0.602</b> | -0.371 | -0.241        | 0.490  | -0.015 | 0.043  | 0.139  | -0.048 |
| Unsociable      | <b>0.769</b>  | 0.013        | 0.384        | 0.127  | 0.370         | 0.260  | 0.105  | -0.002 | 0.154  | 0.076  |
| Unsophisticated | 0.445         | -0.521       | 0.008        | 0.099  | 0.512         | 0.072  | -0.155 | 0.266  | -0.274 | 0.290  |
| Unstable        | 0.591         | -0.161       | <b>0.610</b> | -0.295 | 0.147         | -0.079 | -0.273 | 0.120  | 0.087  | -0.204 |
| Unsympathetic   | <b>0.702</b>  | -0.313       | 0.301        | 0.258  | 0.340         | -0.310 | -0.082 | 0.131  | 0.130  | -0.012 |
| Unsystematic    | <b>0.740</b>  | -0.123       | 0.354        | 0.307  | 0.301         | -0.192 | -0.150 | -0.108 | 0.143  | 0.190  |
| Untalkative     | -0.224        | -0.320       | 0.328        | 0.185  | 0.099         | -0.436 | 0.184  | 0.540  | 0.373  | 0.205  |
| Unvindictive    | -0.427        | -0.260       | 0.221        | -0.562 | -0.195        | 0.209  | 0.124  | 0.294  | 0.407  | 0.190  |
| Urbane          | <b>0.622</b>  | -0.052       | 0.020        | 0.109  | -0.582        | 0.286  | 0.042  | -0.186 | 0.240  | 0.290  |
| Vague           | <b>0.737</b>  | -0.027       | 0.411        | -0.240 | -0.140        | 0.105  | -0.297 | 0.142  | 0.272  | 0.128  |
| Vain            | 0.561         | -0.449       | 0.042        | 0.311  | 0.249         | 0.290  | -0.046 | -0.401 | 0.276  | -0.022 |
| Verbal          | 0.449         | 0.112        | -0.091       | 0.338  | 0.231         | -0.024 | -0.165 | -0.121 | 0.528  | -0.537 |
| Verbose         | <b>0.881</b>  | 0.150        | -0.071       | 0.233  | 0.123         | 0.005  | -0.105 | -0.005 | 0.294  | 0.172  |
| Versatile       | -0.549        | <b>0.612</b> | 0.455        | 0.129  | 0.019         | -0.088 | 0.048  | -0.133 | 0.256  | -0.087 |
| Vibrant         | <b>-0.655</b> | 0.501        | 0.086        | 0.241  | -0.074        | 0.047  | 0.015  | 0.494  | 0.047  | -0.007 |
| Vigilant        | <b>-0.636</b> | 0.426        | 0.192        | -0.044 | -0.282        | -0.122 | -0.184 | 0.416  | 0.253  | -0.096 |
| Vigorous        | <b>-0.707</b> | 0.409        | 0.129        | -0.224 | -0.320        | 0.128  | 0.254  | 0.204  | -0.050 | -0.198 |
| Vindictive      | <b>0.629</b>  | -0.012       | -0.010       | -0.134 | <b>-0.694</b> | 0.096  | -0.070 | 0.155  | 0.140  | -0.216 |

|             |               |              |              |        |        |        |        |        |        |        |
|-------------|---------------|--------------|--------------|--------|--------|--------|--------|--------|--------|--------|
| Vivacious   | <b>-0.655</b> | 0.472        | -0.285       | 0.403  | -0.112 | 0.125  | -0.009 | 0.027  | 0.075  | 0.265  |
| Volatile    | <b>0.654</b>  | 0.126        | 0.169        | -0.425 | -0.473 | -0.212 | -0.246 | 0.079  | 0.101  | -0.034 |
| Warm        | <b>-0.659</b> | 0.400        | 0.120        | -0.519 | 0.194  | 0.166  | -0.112 | 0.026  | 0.204  | -0.036 |
| Wary        | 0.464         | 0.247        | -0.240       | -0.143 | 0.069  | -0.087 | -0.314 | 0.530  | 0.485  | -0.138 |
| Wasteful    | 0.520         | 0.290        | -0.006       | -0.062 | -0.324 | 0.187  | -0.553 | -0.207 | 0.123  | 0.372  |
| Weak        | -0.394        | -0.338       | <b>0.707</b> | 0.093  | 0.365  | 0.061  | -0.137 | -0.126 | -0.039 | 0.221  |
| Weariless   | 0.471         | 0.501        | -0.283       | 0.317  | -0.037 | 0.183  | -0.188 | 0.159  | 0.349  | 0.360  |
| Wise        | <b>0.668</b>  | -0.074       | 0.231        | -0.569 | 0.073  | -0.065 | -0.189 | 0.339  | 0.106  | -0.021 |
| Wishy-washy | <b>0.873</b>  | -0.019       | 0.087        | -0.246 | 0.297  | -0.144 | 0.101  | -0.161 | 0.059  | -0.147 |
| Withdrawn   | <b>0.728</b>  | 0.087        | 0.303        | 0.362  | 0.076  | 0.103  | -0.206 | 0.115  | 0.251  | -0.323 |
| Witty       | 0.199         | 0.361        | -0.549       | 0.460  | 0.399  | 0.099  | 0.134  | 0.239  | -0.234 | 0.133  |
| Wordy       | 0.487         | <b>0.610</b> | 0.044        | 0.213  | -0.102 | 0.260  | 0.318  | -0.332 | -0.217 | 0.083  |
| Worldly     | -0.242        | -0.122       | <b>0.916</b> | -0.033 | 0.047  | 0.176  | 0.169  | 0.021  | 0.050  | -0.149 |
| Zealous     | -0.480        | <b>0.673</b> | 0.050        | 0.076  | -0.424 | 0.024  | 0.005  | -0.153 | 0.192  | 0.259  |
| Zestful     | -0.497        | <b>0.726</b> | 0.058        | 0.036  | -0.284 | 0.102  | 0.003  | -0.094 | -0.107 | 0.332  |

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Extraction Method: Principal Component Analysis.

a. 10 components extracted.