What is the Relationship Between “Personality” and “Social” Psychologies? Network, Community, and Whole Text Analyses of The Structure of Contemporary Scholarship

Kevin Lanning

The structure of social/personality psychology, including the relationship between the areas of “social” and “personality,” is empirically examined in a series of network, community, and text analyses. In a study of keywords, both attitudes and social cognition and group processes appear as communities; the role of personality is more diffuse. In a larger analysis of citations in the four primary journals in the combined social/personality area, personality appears as a large community which surrounds a well-defined core (the Five-Factor Model) but which lies on the periphery of social/personality psychology. Interpersonal relations and attachment are central in social/personality, and appear largely distinct from the study of groups. Attitudes and social cognition are broadly studied, but, in contrast with personality and interpersonal relations, are not structured around a simple core. These methods and results collectively inform the relationship between personality and social psychologies and provide an early step towards an empirical understanding of the structure of the discipline.

Keywords: personality; network; scientometric; social psychology; methods; community

How should the map of social-personality psychology be drawn? What are the relationships among its constituent methods, institutions, papers, scholars, and constructs? The question has implications for the psychology curriculum (How should personality and social psychologies be taught?), for the nature and evaluation of our research (Should a scholar who examines positive affect be asked to review a paper on extraversion?), and even for our self-concepts (Should I call myself a social psychologist?). Yet our understanding of this terrain remains grounded more in anecdote and tradition than in data. In the present paper, I use diverse scientometric methods, including network, community, and text analysis, to provide an initial map of the combined field of social and personality psychology. Limitations of the work should be acknowledged at the outset: This effort provides only a contemporary snapshot of the field and not its evolution over time, it does not yet provide contextually personality and social psychology in the region of other closely related areas of inquiry (such as developmental and cognitive psychologies), and it does not yet consider the extent to which the structure holds outside of prominent conferences and journals published in the United States. Despite these limitations, the methods form an initial toolbox for future study, and the results provide a coherent initial map of contemporary personality-social psychology. Perhaps equally importantly, the paper invites consideration of its central premise, i.e., that the structure of personality and social psychology – fields which take justifiable pride in their empirical achievements – is of consequence and can itself be studied empirically.

What is the relationship between “personality” and “social”?

Personality and social psychology have common roots, including the work of Gordon Allport, whose 1937 and 1954 books are foundational for the two areas. But their history has also been marked by tension (Pettigrew & Cherry, 2012). Personality and social became increasingly distant as psychology expanded in the years following the Second World War (Deaux & Snyder, 2012). In the 1960s and 1970s, this process accelerated, fueled in part by Mischel’s (1968) critique of personality and the related ascendance of social cognitive studies such as those chronicled by Nisbett and Ross (1980), work which carried with it the view that dispositional attributions were largely due to error. There were changes, too, in the structure of relevant APA journals: In 1965, the Journal of Abnormal and Social
Psychology was dissolved into two journals (the Journal of Abnormal Psychology and the Journal of Personality and Social Psychology, or JPSP); beginning in 1980, JPSP was itself split into three separate sections, each with its own editorial board. The last of these sections, under the initial editorship of Bob Hogan, provided a sanctuary for a field of personality psychology which was subjectively under siege.

In more recent years, a number of writers have argued for a rapprochement between personality and social psychology. Baumeister (1999) characterized the fields as largely overlapping. Swann and Seyle (2005) described personality as resurgent and characterized by an “emerging symbiosis” within a unified social psychology. Despite these collegial overtures, relations between personality and social psychologies remain fraught. Lucas and Donnellan (2009) noted that feelings were still raw forty years following the publication of Mischel (1968), and suggested that this was attributable, in part, to a misreading of the sociopolitical values held by personality psychologists. The following year, in an editorial marking the beginning of his term at the helm of Personality and Social Psychology Bulletin, Kitayama argued that it was “imperative to maintain the unity of the field” (2010, p. 3).

Evidently, such calls for unity would not be needed if there were not also forces acting towards division, some of which lie beyond the borders of the two areas. For example, given that scientific progress has long been characterized by an increasing differentiation of disciplines, one might expect that personality and social psychology are moving apart rather than together, that is, towards continuing specialization or fragmentation. Further, one of the major fault lines dividing personality and social psychology, the role of the person versus the situation, runs outside as well as inside our discipline, framed among historians as the Great Man vs Zeitgeist (or Ortega) question.

Although the person-situation debate is critical in understanding the personality-social divide, other distinctions are also important. Cronbach (1957) saw scientific psychology as constituting two methodological traditions, the correlational and experimental. Following a close survey of research methods used and topics studied by editors in journals in social and personality psychology, Tracy and her colleagues found that Cronbach’s “two disciplines” largely distinguished between personality and social psychologies (Tracy, Robins, & Sherman, 2009). Nonetheless, nearly half the individuals they surveyed were best identified as neither personality nor social types but as ‘hybrids’ who use correlational and experimental methods with near equal frequency. These authors advocated for an increasing integration of the two areas.

Despite these efforts, the relationship between personality and social psychologies remains unsettled. This is reflected in the labeling of graduate programs: Of the major programs in social/personality in the United States and Canada listed in Nosek et al. (2010) or the Social Psychology Network (2015), the majority (32 programs) include the label ‘social’ without ‘personality.’ At 21 others, the terms are combined in a single area fused by ands, ampersands, hyphens, slashes, or (in one case) a vertical bar. At just four universities, social and personality are presented in separate areas of study. Across programs, the accuracy of these different labels is uneven; rather, despite the best intentions of department committees, the contents of programs in social, social/personality, and personality psychology likely reflect a ‘jungle-jangle fallacy,’ in which similar entities may be labeled differently, and quite different ones assigned the same name (Kelley, 1927; see Table 1).

### Beyond and beneath personality and social psychologies

Distinguishing between ‘personality’ and ‘social’ psychologies is only one of a number of ways of parsing their combined territory. The structure of JPSP, for example, suggests a tripartite model of Attitudes and Social Cognition (here, JPSPA), Interpersonal Relations and Group Processes (JPSPi), and Personality Processes and Individual Differences (JPSPp). Still richer models are suggested by the structure of ostensibly representative reference sources: Since the earliest Handbooks of Social Psychology, the selection of chapters has been taken as providing a model of the

| Program type/label | University                                      |
|-------------------|------------------------------------------------|
| Social and personality in two separate areas (4 programs) | Northwestern, Michigan, Minnesota-Twin Cities, Western Ontario |
| One program which includes “social” and “personality” (22) | Columbia, Cornell, Michigan State, Northeastern, Princeton, British Columbia, California-Berkeley, California-Davis, California-Irvine, California-Riverside, Illinois-Urbana-Champaign, Missouri, Oregon, Rochester, Texas-Austin, Washington, Wisconsin-Madison, Washington U, Yale, Carnegie Mellon, Toronto |
| One program in “social” without “personality” (32) | Arizona State, Duke, Florida State, Harvard, Indiana-Bloomington, Iowa State, New York, Ohio State, Pennsylvania State, Purdue, Rutgers, Simon Fraser, Stanford, Texas A&M, California-Los Angeles, California-Santa Barbara, Chicago, Colorado-Boulder, Connecticut, Florida, Iowa, Kansas, Massachusetts Amherst, North Carolina-Chapel Hill, Southern California, Utah, Virginia, Waterloo, Claremont Graduate U, Stony Brook, Maryland, Pennsylvania |

**Table 1:** Graduate programs in social and/or personality psychology, 2015.

*Note. Programs are those identified in Nosek et al (2010) as impactful and/or ranked by Princeton Review’s Gourmet Report in social or personality psychology (Social Psychology Network, 2015). Program labels were extracted from individual university websites on 7/15/2015. Program labels may include other areas (e.g., “health” in addition to social and/or personality).*
contents of the field (Gilbert, Fiske, & Lindzey, 1997). In the recently published APA Handbook of Personality and Social Psychology, a fourfold model is presented in which the JPSY structure is largely preserved, but in which Group Processes and Interpersonal Relations are now represented in separate volumes (Mikulincer & Shaver, 2014). The structure of this latest Handbook is hierarchical: The four volumes are partitioned into 23 sections and, excluding introductory pieces, 100 chapters. For example, the volume on Attitudes and Social Cognition is divided into six parts, the first of which is Human Nature. Human Nature is further divided into four chapters, the first of which is Evolutionary Social Cognition (Neuberg & Schaller, 2014).

Limits of a hierarchical model. Although the scope of the 100 chapters of the new Handbook is impressive, and may well provide a representative sampling of research areas in the field, their topics are unlikely to be related in a simple hierarchy. Such a model would predict that topics in different volumes, or in different sections within volumes, should be further apart than chapters in the same volume or section. One metric to assess the distance or proximity of scientific papers is common citations (Boyack & Klavans, 2010). Applying this metric to chapters of the handbook reveals the limitations of the simple model. For example, the Evolutionary Social Cognition chapter shares only one common reference with the chapter, in the same section of the same volume, on Psychological and Sociomoral Reasoning in Infancy (Bailargeon et al., 2014), but eight references with the chapter, in a different section of a different volume, on Evolutionary Personality Psychology (Buss & Penke, 2015). The inadequacy of a simple hierarchy for describing the relative proximity of chapters in the Handbook is not a failure of the editors, but is instead a reflection of the multidimensional structure of social/personality psychology. If the Neuberg (social cognition) and Bailargeon (sociomoral reasoning) chapters are linked by their concern with cognition, the Neuberg and Buss (personality) chapters are linked, and linked more strongly, by a common evolutionary metatheory. A more general network model can provide a better account of the multiple ways, including metatheory, method, target population, intended application, level of analysis, etc., in which the elements of personality and social psychology are connected.

Academic areas as networks and communities
Connections among persons, products, and institutions in social/personality psychology may be represented as a network. As scientific knowledge is largely social (we learn not only in direct interactions with others but also from the papers and writings that others produce), this may be considered a social network. Historically, social network analysis (SNA) has been closely linked with mainstream social psychology. The fields have common roots in Lewin’s (1936) topological and vector psychologies, in applications of graph theory including Heider’s (1946) work on balance theory, and in empirical demonstrations such as Milgram’s (1967) study of small worlds. Today, SNA remains well suited to understanding the reciprocal impact of person and community, as it has illuminated topics such as the extra-dyadic nature of cooperation (Apicella, Marlowe, Christakis, & Fowler, 2012), contagion in political and health-related behaviors (Bond et al., 2012; Christakis & Fowler, 2007), and the network structure of social inequality (DiPrete & Eirich, 2006; Salganik, Dodds, & Watts, 2006).

In a network model, social and personality psychologies may be considered as communities of scholarship. These communities, like physical communities framed by constructs such as race and class, may be thoroughly integrated or largely separate. At one extreme, personality might be represented throughout this undifferentiated space, represented equally in the ideas, papers, journals, and programs of a combined field, rendering training and scholarship in ‘social’ and ‘personality’ psychologies as one and the same. At the other extreme, social and personality psychology would be entirely discrete, non-overlapping sets, and the label and category ‘social/personality’ would be essentially arbitrary.

Sources for networks: Keywords and citations. Models of the structure of scholarly communities and disciplines may be articulated from sources ranging from sociological networks to clickstreams of articles viewed by individual scholars on electronic devices (Bollen et al., 2009; Morris & Van der Veer martens, 2008). Among the simplest models is one based on keyword co-occurrences: Articles, grant proposals, and conference submissions typically include several keywords which facilitate the identification of papers for, among other things, the selection of reviewers. The co-occurrence of keywords across entities such as papers provides a measure of their relative proximity, and can form the basis of an initial network model. In the information sciences, for example, a network model of disciplines and areas of scholarship has been developed on the basis of the co-occurrence of keywords in profiles of individuals registered in Google Scholar (Ortega & Aguillo, 2012).

A more influential and powerful approach to understanding the network of scholarship relies on a bibliometric approach, in particular, upon analyses of citations. Citations may be seen as directed, dyadic acts. Within psychology, prior bibliometric studies have largely focused upon the target rather than the source of these acts, as in studies of citation counts as measures of scholarly productivity (Simonton, 1997). In using bibliometric data to build scholarly networks, as in the present study, the focus of citation analysis is instead on the source rather than the target, that is, the act of citing.

Scholarly communities and family resemblance. Regardless of how the structure of scientific inquiry is articulated, the membership of entities (persons, graduate programs) within topical regions (attitudes, psychometrics) is not discrete but graded: There are typically no methods, theories, etc. which are shared by and uniquely characteristic of all papers within a particular area of scholarship (Bensman, 2001; Campbell, 1969). This suggests a model in which communities of scholarship may overlap and in which membership is characterized by family resemblance rather than by a set of individually necessary and jointly sufficient attributes (Rosch, 1975).

Natural language analysis and the identification of communities. There have long been concerns about ambiguity and arbitrariness in the naming of communities
and constructs in personality/social psychology (Kelley, 1927). One increasingly important method, differential text analysis, may at least partially address this. Here, entities such as scholarly communities are treated as corpora (bodies of text), then compared to extract or interpret their meaning (Green, Feinerer, & Burman, 2013, 2014; Schwartz et al., 2013). Words which empirically differentiate between communities can, in a non-arbitrary way, help label their contents.

### Study overview

In this project I examine the structure of social/personality psychology empirically, using both a small sample of author-selected keywords of papers submitted to two conferences and a more extensive database of bibliographic couplings from papers published in the four most selective journals in the combined social/personality area. The project contributes a new integration of disparate methods for examining the structure of scholarly communities and a set of initial results for understanding the structure of social and personality psychologies.

### Method

Source data for the network analyses derive from two distinct sources, keywords and bibliometric data (citations). For both datasets, I examine the network structure of social/personality psychology and attempt to partition the field into discrete areas of study. In addition, in the bibliometric investigation I explore a more complex model which allows for communities to overlap, and I investigate the contents or meaning of these communities using differential language analysis.

#### Keywords in conference submissions

For the 2015 and 2016 annual conventions of the Society for Personality and Social Psychology (SPSP), each of 4308 submissions of proposals for symposia and posters was required to include two keywords selected from a list of 43 terms (see Table 2). Using the open-source software package Gephi (Bastian, Heymann, & Jacomy, 2009), I constructed an undirected network in which these keywords serve as nodes or vertices. Nodes are connected by an edge when they co-occur in at least one proposal. The weight of edges corresponds to the number of co-occurrences of the terms across the set of proposals.

I identified communities in this network by using a Louvain algorithm which attempts to efficiently maximize modularity or discreteness (Grauwin & Jensen, 2011); the method provides a complete and simple structure in which every observation is associated with one and only one community. Edge weights were included in the analysis, and the resolution value was set to 1.0 (the default). Because attempts to partition networks frequently lead to inconsistent results, this modularization was repeated ten separate times using different seed values (Lancichinetti & Fortunato, 2012).

#### Bibliographic couplings in selected journals in 2014

By a substantial margin, the four most important journals which publish papers in both social and personality psychology (and which include both ‘social’ and ‘personality’ in their titles) are JPSP, Personality and Social Psychology Bulletin (PSPB), Personality and Social Psychology Review (PSPR), and Social and Personality Psychology Science (SPSS) (Scimago lab, 2015). I analyzed the structure of all papers published in these four journals in a single year (2014), with several exceptions. Out of 375 papers, 9 were excluded as they were corrigenda, retractions, or editorial comments. Also excluded were 12 papers which were unavailable at the time of analysis; these appeared in the last 2014 issue of SPSS (i.e., issue 8) for which references had not been added to the PsycInfo database as of 6/10/15. This left 354 source papers, each of which was identified by the last name of the first author and a journal abbreviation. For JPSP, this included a section identifier, which I manually added to the APA data. Where more than one paper was published by the same set of authors in the same journal, papers were disambiguated using a sequence letter (a,b,c). The total number of cited references in these papers was 22,930, of which 5155 (22%) could not be used in the analysis as no DOI was available. Descriptive statistics for these journals and journal-sections are given in Table 3.

This set of citations was analyzed using the open-source software Gephi to produce a bipartite network of 13212 nodes (354 source papers and 12858 cited references) connected by 17775 edges or links (Bastian et al., 2009). Within Gephi, I used the Multi-Mode Network Projection plug-in to reduce this directed, bipartite (paper -> reference -> paper) citation network to an undirected, single-mode (paper <-> paper) structural network in which the weight of a link between any two papers reflects the percentage of references common to them (Kuchar, 2013). This structural network is dense, comprising 8646 links or edges which link the average paper directly to 49 of the 353 remaining papers. The average distance between any two papers is less than 2, and the largest distance is only 5.

For this network, I examined two methods of community structure. First, as in the keyword study, I examined a top-down, simple, or discrete partitioning of the network using Gephi’s implementation of the Louvain algorithm. Second, to investigate a bottom-up, potentially overlapping complex community structure, I used the open-source software C-Finder (Palla, Derenyi, Farkas, & Vicsek, 2005). Here, communities are defined as sets in which each member is linked to at least \((k-1)\) other members, and in which each link is greater than a weight threshold \(w\). Because this technique retains only a subset of the network, and because most of the articles in the network were from the two lower-impact journals (SPSS and PSPB), edges between papers were weighted by Impact Factor in an effort to retain as many of the most important papers in the model. More formally, weights for edges were assessed as the sum of the standardized values for (a) percentage of shared references and (b) product of the Impact Factors of the journals for the two papers.

In addition to citation data, the text of each of these 354 papers was extracted from PDFs using ABBYY Finereader (Abbyy, 2011). The tm package in R was used to prepare documents (Feinerer & Hornik, 2015). Punctuation, words of fewer than three characters, and common stop words (e.g., the, of) were excluded from the analysis, as were less
Table 2: SPSP keywords, by frequency of endorsement and network community.

| Keyword                              | Count | %   | Community |
|--------------------------------------|-------|-----|-----------|
| Close Relationships                  | 496   | 11.5% | Blue      |
| Emotion                              | 483   | 11.2% | Blue      |
| Self/Identity                        | 376   | 8.7%  | Blue      |
| Individual Differences               | 373   | 8.7%  | Blue      |
| Personality Processes/Traits         | 352   | 8.2%  | Blue      |
| Culture                              | 313   | 7.3%  | Blue      |
| Mental Health/Well-Being             | 286   | 6.6%  | Blue      |
| Other                                | 240   | 5.6%  | Blue      |
| Prosocial Behavior                   | 191   | 4.4%  | Blue      |
| Norms and Social Influence           | 177   | 4.1%  | Blue      |
| Belonging/Rejection                  | 166   | 3.9%  | Blue      |
| Aggression/Anti-Social Behavior      | 110   | 2.6%  | Blue      |
| Methods/Statistics                   | 102   | 2.4%  | Blue      |
| Self-Esteem                          | 101   | 2.3%  | Blue      |
| Social Neuroscience                  | 95    | 2.2%  | Blue      |
| Evolution                            | 81    | 1.9%  | Blue      |
| Field Research/Interventions         | 77    | 1.8%  | Blue      |
| Psychophysiology/Genetics            | 62    | 1.4%  | Blue      |
| Lifespan Development                 | 52    | 1.2%  | Blue      |
| Social Development                   | 36    | 0.8%  | Blue      |
| Personality Development              | 34    | 0.8%  | Blue      |
| Meta-Analysis                        | 26    | 0.6%  | Blue      |
| Disability                           | 9     | 0.2%  | Blue      |
| Motivation/Goals                     | 393   | 9.1%  | Yellow    |
| Self-Regulation                      | 230   | 5.3%  | Yellow    |
| Stereotyping/Prejudice               | 504   | 11.7% | Green     |
| Person Perception/Impression Formation | 379  | 8.8%  | Green     |
| Intergroup Relations                 | 315   | 7.3%  | Green     |
| Gender                               | 270   | 6.3%  | Green     |
| Groups/Intragroup Processes          | 234   | 5.4%  | Green     |
| Politics                             | 119   | 2.8%  | Green     |
| Diversity                            | 89    | 2.1%  | Green     |
| Social Justice                       | 75    | 1.7%  | Green     |
| Judgment/Decision-Making             | 364   | 8.4%  | Red       |
| Applied Social Psychology            | 312   | 7.2%  | Red       |
| Attitudes/Persuasion                 | 303   | 7.0%  | Red       |
| Morality                             | 212   | 4.9%  | Red       |
| Physical Health                      | 169   | 3.9%  | Red       |
| Organizational Behavior              | 112   | 2.6%  | Red       |
| Religion/Spirituality                | 102   | 2.4%  | Red       |
| Nonverbal Behavior                   | 82    | 1.9%  | Red       |
| Language                             | 53    | 1.2%  | Red       |
| Law                                  | 43    | 1.0%  | Red       |

Notes. N proposals = 4308, excluding six submissions in which the keyword "Special session" appeared. Duplicate keywords (e.g., Other, Other) were supplied for 18 proposals.
relevant terms such as descriptions of the formal structure of papers (abstract, conclusion), near-universals (behavior, condition, data), and numbers (one, four). In addition, words were set to lowercase. Following this tokenizing, for each community in each of the two analyses, the text of all papers was combined into a single corpus, then compared to a baseline derived from all 354 of the papers under study. Finally, in addition to examining the network at the level of the individual paper, the network of links between journals or, in the case of JSPS, journal-sections, was also examined.

Results
In the analysis of keywords, terms were used an average of 200 times, with Stereotyping/Prejudice (504, 12%), Close Relationships (496, 12%), and Emotion (483, 11%) each appearing in more than 10% of submissions. There was little evidence of redundancy in the keyword list. No term was directly linked to all others, but Stereotyping/Prejudice was directly connected to all but one (Personality Development). The strongest link between any two keywords was that between Stereotyping/Prejudice and Intergroup Relations, which co-occurred in 109 submissions.

Communities based on keywords
In this network, the average keyword was directly linked to most others (29.3, 70%) with the remaining 30% separated in the network by only one term. The strongest relationships in this network are represented in Figure 1; the network is restricted to only those keywords which were selected 200 or more times (above the mean for all terms), and to only co-occurrences or edge weights of 20 or more. Across ten analyses, results were largely consistent, with one exception: In seven of the ten analyses Self-Regulation and Motivation/Goals formed their own (yellow) cluster; in the remaining analyses, this was included in the broader (blue) cluster. Communities resembling Group Processes (green) and Social Cognition (red) could be identified, but Personality appeared only as part of a heterogeneous community which includes such keywords as Close Relationships and Emotions.

Personality in the keyword space. In the network of SPSP submissions, personality does not emerge as a separate community, but is rather diffusely connected across the space. Overall, the two personality keywords appear in 16% of the proposals, and are disproportionately likely to be paired with Personality Development (32%) and Methods/Statistics (21%). By way of contrast, these two keywords appear in only 3% of the proposals with Stereotypes/Prejudice, revealing a decline of interest in the intersection of these areas since early research on, for example, the California F-scale (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950). This decline of interest in personality and prejudice is mirrored by an opposing trend for the keyword Motivation. A generation ago, research in motivation was waning (Hilgard, 1987); today, the resurgence of the concept is apparent in its popularity in the present set of keywords (Table 2) as well as in its dense connections with concepts such as Self-Regulation, Emotion, and Close Relationships.

Communities based on bibliometric data
In the analysis of citation data, two separate approaches to communities were examined, i.e., a simple, comprehensive, top-down partitioning of the network, and a complex, selective bottom-up model in which communities are built up from cliques. The two models provide complementary perspectives on community structure.

A simple community model. As in the keyword study, a Louvain partitioning of the network was run ten separate times using different seed values. These led to the extraction of between seven and ten communities; here, a representative solution with eight communities is considered. In order to explore this solution further, I treated each community as its own network and, using Gephi, identified the most central or characteristic papers using Page Rank (a recursive measure of network centrality; Page, Brin, Motwani, & Winograd, 1999). I also examined the model using natural language analysis. Here, for each community, I combined the text of the individual papers into a single corpus; then, following Schwartz et al (2013), I extracted the set of terms whose Ancombe-adjusted proportion showed the greatest difference between the papers in that community and the baseline set of all documents. These characteristic papers and terms together provide a description of the content of the communities, and are summarized in Table 4. Supplementary materials include a list of all community members (Table S1), a depiction of the network (Figure S1), and word clouds providing a more in-depth description of their characteristic language (Figure S2).

A community of papers focused on Personality was the largest in the network, with 80 papers. The most characteristic terms were personality, life, children, wellbeing, and traits; the most central papers were a study of cross-cultural
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Figure 1: Network of keywords in SPSP conference submissions. Each submission to the conferences of the Society for Personality and Social Psychology (SPSP) includes two keywords; here, the co-occurrence of keywords is represented as a network. Node size corresponds to keyword frequency, node color to community, edge thickness to frequency of co-occurrence, and edge color reflects a blend of the keyword pair. Only the most frequently chosen keywords and the strongest links among them are shown (minimum degree = 200, minimum edge weight = 20).

| Label                        | Size | Most characteristic papers                                                                 | Most characteristic terms                   |
|------------------------------|------|---------------------------------------------------------------------------------------------|---------------------------------------------|
| Personality (s2)             | 80   | Church “A four-culture study of self-enhancement” [3], Jeronimus “Mutual reinforcement between neuroticism and life experiences”, both JPSPp. | personality, life, children, wellbeing, traits |
| Threat (s7)                  | 66   | Schumann “I’m sorry about the rain” [4], PSPB Brooks “Who accepts responsibility” SPPS. | threat, belief(s), women, academic, negative |
| Categorization/Aggression (s5)| 46   | Yang “Effects of avatar race” [5], Wang “Stupid doctors and smart construction workers,” both SPPS. | effects, video, group, ingroup, black        |
| Ideology (s3)                | 44   | Day “Shifting liberal and conservative attitudes” [6], Piazza “Religiosity, political orientation” SPPS. | moral, political, character, roles, values  |
| Relationships (s6)           | 41   | Lemay “Diminishing self disclosure” [7], Hui “The Manhattan effect,” both JPSPi. | relationship(s), partner(s), attachment, romantic, satisfaction |
| Ostracism and social pain (s1)| 36   | Pitts “When one is ostracized”, SPPS Clapool, “Social exclusion and stereotyping” JPSPi. | social, exclusion, pain, emotions, group    |
| Thinking/reasoning (s4)      | 28   | Kruger “Response category width” [8], Yan “Future events are far” JPSPa. | distance, construal, probability, future, concrete |
| Intergroup anxiety (s0)      | 13   | West “A little similarity. . . interracial relationships” [9], West “Anxiety perseverance” both JPSPi. | intergroup, anxiety, interaction(s), outgroup, similarity |

Table 4: Simple community model: Characteristic features of communities.

Note. Community size = Npaper. Most characteristic papers are those with the highest Page rank within each community. Most characteristic terms are those with which appear with the greatest relative frequency in this community compared to baseline of all communities. Titles for characteristic papers are partial; full references are provided in Supplementary materials.

A similar degree of mapping between the source of papers and their communities in this model held for the other two JPSP sections: Roughly one-third of the papers in JPSPi (14/43) and JPSPa (9/30) appeared in the communities labeled Relationships and Thinking...
and Reasoning, respectively. Other communities in the model included Threat and Beliefs, Categorization and Aggression, Ideology and Character, Ostracism and Social Pain, Thinking and Reasoning, and Intergroup Anxiety.

A complex community model. Although the simple community model provides a clear and comprehensive analysis of the network, it provides only a limited account of community structure. It does not recognize relationships between communities, and so cannot identify papers which might function as bridges between communities, or, at a higher level, communities which might themselves function as bridges between other regions of the personality-social space. Consequently, though a complex community model does not typically provide a comprehensive representation of the entire network, it can potentially serve as a valuable complement to a simple, top-down model.

To examine the complex structure of the personality-social citation network, I followed Palla et al.’s (2005) technique, extracting a solution which maximizes structure by examining only links above a “percolation threshold.” Here, each community consists of papers which are linked to at least seven others, with links restricted to the strongest half of those in the network. The eleven communities are further reduced to nine by consolidating two strong communities linked to at least seven others, with links restricted to the strongest half of those in the network. This results in a complex structure in which 176 papers are placed in one or more interlocking areas of scholarship. As in the simple community analysis, I present the most central (highest Page rank) and, on the basis of natural language analysis, the most characteristic terms for each of these communities in a Table (Table 5). The largest of these communities was a diffuse, omnius group of 105 “Social” papers in which two papers on morality and responsibility were most central (Frizer, Schaefer, & Oakes, 2014; Schumman & Dweck, 2014). As with the simple community model, complete lists of community members appear in Table S1.

Two figures illustrate the utility of the complex model. Figure 2 illustrates relations between three communities. In it, a community of papers on self-regulation forms a bridge between communities of personality and attitudes/exclusion. Within these communities, a paper on regulatory focus in personality (Manczak, Zapata-Gietl, & McAdams, 2014) forms a bridge between personality and self-regulation; the latter community is, in turn linked to attitudes/exclusion by a paper on aversion to impending or approaching stimuli (Hsee, Lu & Ruan 2014).

In Figure 3, an overview of relations between all eight communities in this complex model is provided. In this figure, the size of nodes corresponds to the number of papers in the communities, and the breadth of links indicates the number (percentage) of papers which they share. Here, the diffuse social community (c2) lies at the hub of the network, and is linked to each of the remaining communities. The left and upper regions of the network include three regions associated with attitudes and social

| Label         | Size | Most characteristic papers                                      | Most characteristic terms                  |
|---------------|------|-----------------------------------------------------------------|--------------------------------------------|
| Social (c2)   | 105  | Frumer “Moral actor, selfish agent” JPSPi                      | American, trust, pain, use, will           |
|               |      | Schumann “Who accepts responsibility” PSPB                   |                                             |
| Relationships (c3) | 50   | Lemay “Diminishing self-disclosure” JPSPi                      | Social, relationship(s), partner(s), attachment, personal |
|               |      | Knowles “Social rejection biases” SPPS                       | Will, social, others, black, attitude      |
| Attitudes/exclusion (c6) | 13   | Newark “Once bitten, twice shy . . . past refusal [and] future compliance” SPPS | Personality, traits, neuroticism, dimensions, life |
|               |      | Mallett “Goal preference shapes confrontations of sexism” PSPB |                                             |
| Personality (c4) | 12   | Yang “The key ingredients of personality traits” PSPB         | Students, academic, will, value, free      |
|               |      | Jeronimus “Mutual reinforcement between neuroticism and life experiences” JPSPP |                                             |
| Social Cognition (c5) | 12   | Funder “Improving the dependability of research” PSPR         |                                             |
|               |      | Yeager “The far-reaching effects of believing people can change” JPSPu |                                             |
| Attraction/mating (c1) | 11   | Meltzer “Sex differences in the implications of . . . attractiveness” | Pain, attractiveness, mate, social, partner |
|               |      | Meltzer “. . . Joiner,” both JPSPi                           |                                             |
| Implicit attitudes (c0) | 8    | Yang “Effects of avatar race,” Gonsalkorale “Measures of implicit attitudes,” both SPPS | Racial, implicit, measure, explicit, white |
| Self-regulation (c7) | 8    | Malaviya “Do hedonic motives moderate regulatory focus,” Zou “In pursuit of progress: Promotion motivation” both JPSPu | Regulatory, focus, social, trait, promotion |
| Interpersonal perception (c8) | 8    | Leising “Judging the behavior of people we know” PSPB          | Perceivers, will, included, targets, implicit |
|               |      | Lemay “Diminishing self-disclosure” JPSPi                      |                                             |

Table 5: Complex community model: Characteristic features of communities.

Note. Community size = Npapers. Most characteristic papers are those with the highest Page rank within each community. Most characteristic terms are those with which appear with the greatest relative frequency in this community compared to baseline of all communities. Titles for characteristic papers are partial; full references are provided in Supplementary materials.
cognition (c0, c5, and c6). The right and lower sides of the network is largely defined by an axis of papers in the inter-personal domain; here, a large community of scholarship in relationships (c3) is framed by smaller communities of papers in the areas of attraction/mating (c1) and interpersonal perception (c8). The seven papers which appear in two or more of these three communities all appear in *JPSP* or in *PSPR* (Table S1). The nature of and links between the constituent communities of this complex model is further illustrated in supplementary Figures S3, S4, and S5.

### Relations between journals

Relations between the journals (or, in the case of *JPSP*, journal-sections) are shown in Figure 4. As is illustrated by the varying thicknesses of the edges in the figure, although all six journals are directly connected to each other, the weight of these links varies. *JPSP* is central, both in its location in the network and in its node size, which reflects weighted degree or the average connectedness between papers in this section and all of those in the network. The loops surrounding each node reveal that the *JPSP* and *JPSP* sections are relatively homogeneous, that is, that papers in these journal-sections have a high tendency to cite other papers in the same section. Of the three *JPSP* sections, *JPSP* is a relative outlier, as connections between it and all of the remaining journals and journal-sections are relatively tenuous.

### Discussion

Like the proverbial elephant, the domain of personality and social psychology is best understood from multiple vantage points. History and tradition, with models such as the tripartite division of *JPSP*, provide one perspective. Self-report studies, including Tracy et al.‘s (2009) survey, are another...
Figure 3: Overview of relations among communities in a complex model. Node size is proportional to number of papers, edge thickness to number of shared papers between communities. Node placement is determined using a Force Atlas algorithm. Community numbers (c2) are for identification purposes only.

Figure 4: Citation relationships among major journals in social/personality psychology in 2014 indicate the centrality of interpersonal processes to contemporary social-personality psychology. Edge thickness corresponds to the similarity of reference lists of papers in different journals. Loop thickness indicates similarity of papers within journals. Node size corresponds to weighted degree and is adjusted for Impact Factor. Node placement is determined using a Force Atlas algorithm.
approach. That work illuminated the continuing importance of methodological differences in personality and social research orientations. The analysis of keywords in the first section of the present paper is likewise grounded in self-report data, and also provides insights, illuminating, for example, a surprising distance between research on personality and the study of prejudice and discrimination.

Though tradition and self-report data are valuable, bibliometric methods including network analysis have substantially greater value as tools for mapping scientific domains (Börner et al., 2012; Boyack & Klavans, 2010). The primary contribution of the present study is in its application of these methods, as well as natural language analysis, to analyze the structure of personality and social psychology. Limitations of the work should be acknowledged: The method of text analysis used here is quite primitive, focusing on single rather than multiple words and manifest content rather than latent meaning (see, e.g., Dehghani et al., 2016). More importantly, the data on which these analyses are based focus on only a single year of scholarship. Nonetheless, these results, taken together provide insights into each of five component subareas of the field, and, in turn, the degree of distinctiveness or overlap of personality and social psychologies.

**Attitudes**

In the keyword analysis, attitudes appeared together with social cognition. In each of the two community analyses of the bibliometric study, attitude research split into two distinct regions. In the simple model, communities of attitude research were defined by content, with political attitudes in one area (ideology/character, s3), and racial attitudes in another (categorization/aggression, s5). In the complex analysis, communities of scholarship in attitudes were distinguished on methodological grounds into direct (c6) and implicit approaches (c0). The distinctness of these regions, whether marked by content or method, suggests that “attitudes” is not a single coherent area of psychological inquiry, but is instead an umbrella concept which subsumes several relatively narrow and densely connected themes.

**Social cognition**

As with attitudes, social cognition was multiply represented in the simple community model, with distinct communities including thinking/reasoning, threat/beliefs, and ideology/character (Table 4). In the complex community model, social cognition was diffusely represented throughout the network, appearing both in a cluster of papers concerned with academics, identity, and will (c5) and in the diffuse core (c2). In contrast to the study of attitudes, research in social cognition appears broad but thinly connected. The heterogeneity of research in social cognition is consistent with the continuing importance of “microtheories” in this area of social psychology.

**Interpersonal relationships**

In the keyword study, the term close relationships appeared together with personality, emotion, and other terms in a single large community. In the main study, a more articulated picture of interpersonal relations was seen. Differential language analyses of both the simple (s6) and complex community structures reveal that dyadic romantic relationships lie at the core of this scholarship in this area. The interpersonal domain includes a large number of papers distinguished by warmth and quotidian comfort (c3; satisfaction, close, attachment) and a smaller area which appears more emotionally fraught (c1; anxiety and pain as well as romantic, attraction, mate, and physical); these communities roughly reflect the evolutionary imperatives of companionship and sex, respectively. The distinguishing papers in the third community in this area appear to deal with aspects of interpersonal behavior outside of the sphere or spheres of love and sex, including interpersonal perception (c8). Taken together, these community analyses suggest that interpersonal relations are central not just to the meaning of social/personality psychology, and not just to the physical arrangement of JPSp sections, but also to the structure of scholarship in the field (Figures 3, 4, and Supplementary materials).

**Group processes**

Group processes appeared as a distinct and coherent community in the keyword analysis and was well-represented in the simple community analysis. The central papers and characteristic terms of one community, Ostracism and Social Pain (s1), suggest that it may function as a bridge between the interpersonal and group domains: Papers in this community overlap with those in relationships (c3), but in the language analysis it is distinguished by terms expressly associated with groups (e.g., group, collective, others, belonging). Terms associated with groups were also characteristic of two other communities in the simple analysis, Intergroup Anxiety (s0) and Categorization/Aggression (s5; see Figure 3). In the complex community model, however, group processes were relatively poorly represented: Only one of the thirteen papers in Intergroup Anxiety and 12 of the 46 in Categorization/Aggression were retained in the more restricted model. The poor representation of group processes in the complex model suggests that scholarship in the area is less densely connected than that for other areas of social and personality psychology.

**Personality**

Four distinct results bear on the nature and position of personality in the social-personality network. First, in the analysis of keywords, Personality Processes/Traits or Individual Differences were paired with all but one of the remaining terms, but “personality” did not emerge as a discrete community. Second, personality was the largest community in the simple bibliometric analysis. Third, personality was among the smaller communities in the complex bibliometric analysis. Fourth, there was a lower weight for the self-loop in the journal analysis (i.e., the proportion of within-journal citations) for JPSp than for the other two JPS sections (see Figure 4).

Taken together, these results reveal that contemporary personality psychology constitutes a well-defined or much-cited core that is framed by a wide range of
loosely-connected traits or constructs. Closer examination of these structures, including the word clouds in the supplementary materials, indicate that the core is the five-factor model, and that it is framed by other individual differences constructs (empathy, religiosity) as well as higher-order and metatheoretical concepts (adjustment, development, health, individual, situation). Perhaps more surprising, the language analysis did not support the hypothesis that personality psychology is primarily characterized by unique (correlational) methods: Neither the terms “correlation” nor “regression” (nor expansion of these stems) appear among the fifty most characteristic terms for the personality communities in either the simple or complex community models (cf., Tracy et al, 2009; see supplementary materials).

We are (not) one: Implications for the understanding of social and personality psychologies

Labels such as ‘social,’ ‘social/personality,’ and ‘personality’ should not be arbitrary. A re-evaluation of the relationship between social and personality psychology leads to six key considerations.

First, personality psychology is not central to social psychology. In contrast to, for example, interpersonal processes, the core of social psychology would be essentially unchanged without personality (Figure 3). Similarly, scholarship in JPSP is less central to the combined field than that of the other two sections of the journal (Figure 4). As is witnessed in the table of contents of innumerable undergraduate texts, a map of social psychology can be drawn without personality psychology.

Second, personality psychology is vital, the largest single component in the simple community model (Table 4), and coherent, as described in the previous section.

Third, personality psychology is handicapped by its small size. Given the asymmetric character of social and personality psychologies, preferential attachment (the “Matthew effect”) suggests that the greater centrality or importance of social psychology within a social/personality network can be expected to grow over time. In light of this, it is not surprising that Baumeister (1999), in his analysis of relationships between personality and social psychologies, noted that

In a sense, social psychologists have begun to “colonize” personality. The editorships and review boards of personality journals are increasingly staffed with people who are in some official sense social psychologists. The topic areas of personality psychology are studied by social psychologist. Social psychologists even teach many of the university courses in personality (p. 369).

Fourth, perceptions of the relationship between social and personality psychologies are distorted by intergroup dynamics: As social and personality psychologies are identities as well as institutions, members of the majority group of social psychologists are likely to be insensitive to the clamoring for autonomy for, and claims of uniqueness by, personality psychologists. Members of the minority group of personality psychologists are, in turn, likely to focus narrowly on differences rather than similarities, to remain protective of their identities, and to be skeptical of claims that they will be fairly represented within a single broader field that defines itself as social, or even social/personality, psychology. In short, social psychologists can be expected to underrecognize, and personality psychologists to overemphasize, differences between the two areas.

Fifth, important bridges exist between personality and social psychologies, providing support for a complex community model of the discipline. Although the personality-social fault line is the most important in the field, it is breached to greater or lesser degrees by many investigators, institutions, and areas of study (e.g., self-regulation in Figure 2; see also Tracy et al, 2009). Any simple model of academic community structure, including those which divide personality from developmental psychologies and, in turn, psychology from other natural and social sciences, distorts the map of science. Though the present complex model of disciplines is at best preliminary (Figure 3), it illustrates an approach that can ultimately present a more accurate model of the field.

Sixth, any empirical model of the field, no matter how well refined, can take one no further than providing an idealized version of the status quo (Hume, 1739). An understanding of the territory of personality and social psychology is prerequisite to goals ranging from the construction of a representative curriculum to the optimal selection of reviewers and grant panelists. Ultimately, analyses of the structure of personality/social psychology have the potential to reveal a non-arbitrary set of core research topics, to uncover the nature of methodological and conceptual interrelationships between these and other areas, and, as this is a network of persons and institutions as well as concepts, to create intellectual capital by helping researchers identify potential new collaborators, and students appropriate graduate programs and post-docs. But despite this appeal, empiricism alone cannot define the terrain of the field, for it can provide only an idealization of the status quo. What social/personality psychology is, in short, is not necessarily what it should be.

Data accessibility statement

Raw network data (edges and nodes) for both keyword and citation networks may be found at https://osf.io/evx4w/.

Additional File

The additional file for this article can be found as follows:

- Supplemental material. DOI: https://doi.org/10.1525/collabra.70.s1

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Competing Interests
The author has no competing interests to declare.

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