Rethinking the nature and relation of fundamental dimensions of meaning

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Agency and communion matter because people can use these Big Two dimensions to mentally organize all sorts of social entities varying from macro to micro, including countries, groups (Fiske et al., 2002, this volume), individuals (Abele & Wojciszke, this volume), and the self (Abele & Hauke, this volume). More importantly, the Big Two matter because thinking, feeling, and acting in agentic and communal ways is goal-relevant and functional in the short and long run (Locke, this volume; Ybarra, this volume). Thus, people want to be and see / present the self as agentic and communal (Abele & Hauke, this volume; Paulhus, this volume) – sometimes to an excessive extent (Gebauer & Sedikides, this volume) – and they try to balance agency and communion, a task not always easy to perform (Yzerbyt, this volume; Helm & Möller, this volume). Consistent with the desirability of the Big Two, agency and communion information weighs heavily, influencing emotions, behaviors (Cuddy, Fiske, & Glick, 2007), and well-being (Locke; this volume). In sum, the Big Two indeed appear to be the two fundamental dimensions that people prioritize over other dimensions of meaning (Abele & Wojciszke, 2014). Despite the persuasiveness of this conclusion, in this chapter we invite rethinking the nature and relation of prioritized dimensions.

Why and how to reexamine fundamental dimensions in a data-driven way

In many studies on prioritized dimensions, only agency and communion were related to variables of interest or perceivers related targets of interest to agency and communion only. For example, self-esteem, evaluation of others, and social comparison were predicted from agency and communion (Wojciszke, Baryla, Parzuchowski, Szymkow, & Abele, 2011). People rated politicians, women, men, the self, traits, grandiose self-thoughts, and experienced events on agency and communion (Abele & Wojciszke, 2007; Cislak & Wojciszke, 2008; Gebauer, Sedikides, Verplanken, & Maio, 2012; Sczesny, 2003), categorized cultural practices as agentic and / or communal (Ybarra et al., 2008), rated groups on status, competence, warmth, and competition with other groups (Fiske et al., 2002),

inferred agency and communion from behaviors (Abele & Bruckmüller, 2011) etc. In sum, many widely cited studies focused on the Big Two.

In contrast, our research program started in a data-driven way (i.e., without focus) based on the argument that focusing on only agency and communion for theoretical reasons might have overlooked other prioritized dimensions (Koch, Imhoff, Dotsch, Unkelbach, & Alves, 2016a). More precisely, perceivers cannot prioritize dimensions other than the Big Two if they relate only agency and communion to variables of interest or relate targets of interest to agency and communion only. Thus, studies that focus on the Big Two cannot show that people prioritize the Big Two and not additional or other dimensions because their design constrains findings to insights into the variability, relation, and / or function of the Big Two. To get at the nature, relation, and function of fundamental meaning, we decided to run data-driven studies in which people were free to prioritize any desired dimension(s).

According to Brunswik's (1955) notion of representative design, however, free choice of dimension(s) is a necessary but not sufficient to study fundamental meaning in a data-driven way. In addition, perceivers must respond to target distributions that represent the social world – otherwise generalizing results beyond the lab is out of reach. For example, if perceivers respond to targets theoretically constrained to differ in agency but not communion, they will not prioritize communion because it is uninformative (Tversky, 1977). Importantly, in many studies on fundamental meaning (e.g., Abele & Bruckmüller, 2011), perceivers responded to targets that by design differed greatly on the Big Two but no other dimension. If targets in the social world also differ greatly on other dimensions, however, such studies may overlook fundamental meaning regardless of perceivers' free choice of dimension(s). To avoid this, besides designing free choice of dimension(s), in our data-driven studies perceivers responded to target distributions that well represented the social world.

We reasoned people know best which targets well represent their social world. Thus, we gave perceivers free choice of targets, too (Koch et al., 2016a). More precisely, initial

samples of perceivers listed social world-representative targets, and we gave subsequent samples of perceivers free choice to relate the most frequently named targets to any desired dimension(s). Following previous data-driven research, we instructed perceivers to judge targets' similarity. Similarity needed to be interpreted before it could be judged. For example, the similarity of doctors and bankers needed to be interpreted with respect to agency, communion, or something else before it could be judged. If agency, the two targets would be judged as similar. If communion, they would be judged as different. Crucially, perceivers were free to prioritize any desired dimension(s) to interpret and judge targets' similarity.

Conservative-progressive beliefs: An overlooked fundamental dimension

In a first series of data-driven studies (Koch et al., 2016a), we instructed people to list groups that well represent their social world. We made an effort not to prime groups ("[…] what various types of people do you think today's society categorizes into groups?", see Fiske et al., 2002, p. 883). People listed between three and 30 groups. We compiled a social world-representative sample including all 42 groups listed by at least 10% of all people (e.g., Blacks, women, rich people, alcoholics, punks, and Muslims, see Figure 1). Next, another sample of people used the spatial arrangement method (Koch, Alves, Krüger, & Unkelbach, 2016b; Lammers, Koch, Conway, & Brandt, in press) to judge the groups' similarity. The groups appeared in labels in the middle of a blank screen, and people's task was to spatially rearrange (i.e., drag-and-drop) them in such a way that more similar (more different) groups were placed closer together (further apart). Once finished, we recorded the spatially arranged proximity between each group and each other group as the judged similarity of the respective unique pair of groups. This method was highly efficient because rearranging a group readjusted the proximity (i.e., similarity) between that and all other 41 groups on the screen.

We averaged spatially arranged similarity separately for each unique pair of groups, and we subjected these mean pairwise similarity indices to multidimensional scaling (MDS; Hout, Goldinger, & Papesh, 2013). MDS estimated coordinates for each group in a

statistically well-fitting two-dimensional map such that their proximities best reflected the

way in which they had, on average, been spatially arranged according to their similarity. So,

we computed people's mean similarity map (see Figure 1 minus the two content dimensions).

Next, we presented the map to other people who listed dimensions that might explain the

groups' configuration in the map. Next, another sample of people categorized >90% of all

repeatedly listed dimensions as relating to one of the three candidates shown in Table 1:

agency / socioeconomic success, conservative-progressive **b**eliefs, and **c**ommunion.

Table 1

A	B	C
(agency / socioeconomic success)	(conservative-progressive beliefs)	(communion)
Powerless – Powerful	Traditional – Modern	Untrustworthy – Trustworthy
Low status – High status	Religious – Science-oriented	Dishonest – Sincere
Dominated – Dominant	Conventional – Alternative	Cold – Warm
Poor – Wealthy	Conservative – Liberal	Threatening – Benevolent
Unconfident – Confident		Repellent – Likable
Unassertive – Assertive		Egoistic – Altruistic

Next, other people rated the groups on A, B, or C. We averaged A, B, and C separately

for each group. Finally, in three multiple linear regression models, we predicted groups' mean

A, B, and C ratings from the groups' x- and y-coordinates in people's mean similarity map.

The multiple correlations of these regression models indicated the suitability of A, B, and C

for explaining the groups' configuration in the map (i.e., for explaining the dimensions that

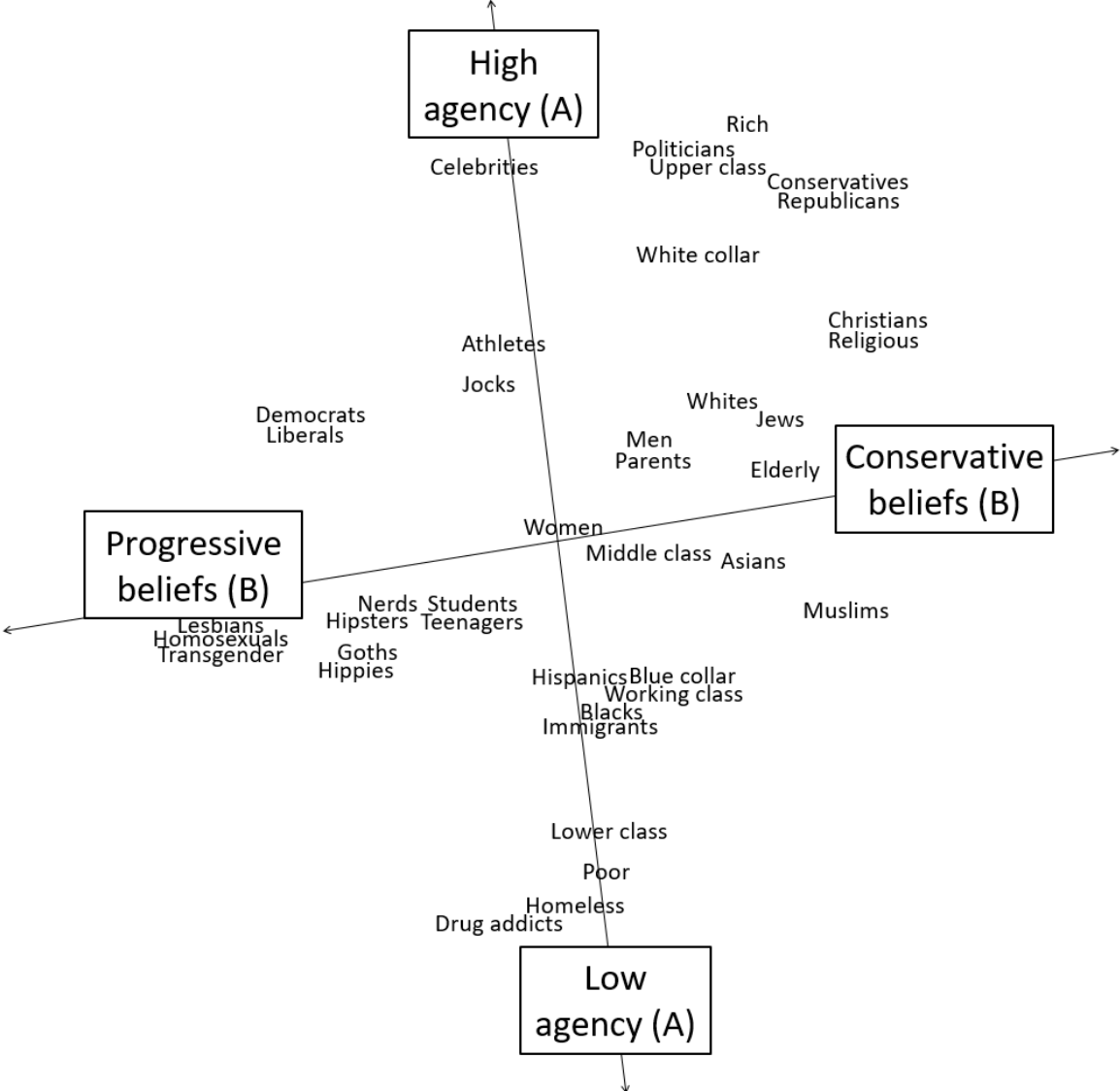people had spontaneously used to interpret and judge the groups' similarity.

Figure 1.

Figure 1 plots A and B where they best explained the groups' configuration in the similarity map (groups' projections on A and B as plotted in the map correlated .93 and .94 with the groups' mean A and B, respectively). Figure 1 does not plot C because it could not be modeled as a dimension spanning the map ($r < .15$). Thus, inconsistent with the Big Two (Fiske et al., 2002), results showed that people had freely chosen agency (A) and beliefs (B) but not communion (C) to interpret and judge the similarity of the groups, suggesting that the dimensions that people spontaneously use to make sense of their social world are A and B but not C. In six studies, this AB model of fundamental meaning replicated across ~ 4,000 people,

two national contexts, four group sets compiled in different ways, three similarity measures, and three similarity judgment instructions (global, character, and personal encounter similarity; Koch et al., 2016a).

As outlined above, people can use the Big Two to differentiate all sorts of social entities varying from countries to brands. Thus, evidence that people spontaneously use AB to differentiate entities other than social groups would further validate the AB model. There were only a few job groups among the social groups we had examined (Koch et al., 2016a, see Tables 1, 5, and 6). We thus took job groups as a separate entity domain. We used the same design and analysis as outlined above (two studies, $N \sim 1,800$, two national contexts), except that people did not list job groups at first. Instead, we examined all 150 basic, distinct job groups listed by the U.S. Department of Labor (i.e., the entire entity domain). The first two dimensions that people spontaneously used to spatially arrange the job groups were agency / competence (i.e., A) and progressiveness (i.e., B; designers, artists etc. were high scorers, whereas morticians, firefighters etc. were low scorers). Next, we replicated spontaneous differentiation on A and B with all 84 basic, distinct job groups listed by the International Standard Classification of Occupations (Imhoff, Koch, & Flade, 2017). Next, we generalized the AB model from social and job groups to the 48 U.S. mainland states (two studies, $N \sim 1,800$, two similarity measures; Koch, Kervyn, Kervyn, & Imhoff, in press). Taken together, these lines of data-driven research provided support for a third fundamental dimension of meaning overlooked in theory-driven research on the Big Two: B as in beliefs ranging from conservative to progressive.

In fact, B became known decades before our work, namely as tight-loose in Peabody's person perception and group stereotypes models (1985; see Peeters, 2008), as backward-modern in Jones and Ashmore's (1973) group stereotypes model, as conservation-openness to change in Schwartz and Bilsky's (1987) human values model, and as conventional-alternative

in Pattyn and colleagues' (2013) person perception model etc. These likewise data-driven research lines further support B as a fundamental dimension of meaning.

The Big Two model is supported by effects of AC information on social cognition. Thus, for B to be seriously considered as a fundamental dimension, B information should influence social cognition, too. First, we showed effects of B information on social inference. People inferred that members of social groups more similar in stereotypic B are more likely to be in the same place at the same time, and are more likely to like one another (Koch et al., 2016a, see Study 7). People also inferred that citizens of U.S. states more similar in stereotypic B are more likely to like one another (Koch et al., in press, see Study 3). Next, we showed effects of B information on source memory. People read statements by members of stereotypically conservative and progressive job groups and later guessed who had said what. They confused members of different conservative (progressive) groups more often than conservatives with progressives and vice versa (Imhoff et al., 2017, see Study 5). We also showed effects of B information on attitude generalization. People recalled positive or negative police officer behaviors and then evaluated all 150 basic, distinct job groups listed by the U.S. Department of Labor. Job groups more similar to police officers in stereotypic B were evaluated more positively after recall of positive compared to negative police officer behavior (Imhoff et al., 2017, see Study 6). In sum, B information influenced social inference, source memory, and attitude generalization ($N \sim 1,000$), further raising our confidence that B is a fundamental dimension of meaning.

Minding conservative-progressive beliefs is for balancing exploitation and exploration

The Big Two are deemed fundamental dimensions not least because empirically well supported theories (e.g., Abele & Wojciszke; chapter 3 in this volume; Fiske, this volume; Locke, this volume; Ybarra, this volume; Yzerbyt, this volume) clarify the goal-relevance and functionality of agency and communion. Thus, for B to match up to A and C, an empirically

supported theory should clarify the purpose and benefit of differentiating social entities as more conservative versus more progressive.

So, why mind B? Is this useful? Conservatives seek and provide feelings of stability, predictability, control, safety, comfort and belonging. Thus, they advocate religion, traditions, conventions, and uniformity. Broadly speaking, they favor routine, safe choices / available rewards of certain quality and quantity (i.e., resource exploitation). Progressives seek and provide feelings of curiosity, stimulation, expansion, entertainment, and distinctiveness. Thus, they advocate science, innovations, autonomy, and diversity. Broadly speaking, they favor alternative, risky choices / uncertain rewards of unknown but possibly high quality and quantity (i.e., resource exploration; Hibbing, Smith, & Alford, 2014; Jost, Federico, & Napier, 2009). Thus, conservatives inspire, and provide opportunities and support for, exploitation, whereas progressives inspire, and provide opportunities and support for, exploration. Accordingly, the purpose and benefit of minding B could be guidance in solving the trade-off between exploitation and exploration.

Solving this trade-off between available resources of certain quality and quantity and uncertain resources of unknown but possibly high quality and quantity is, and throughout evolution and cultivation has always been, tough but important for successful self-regulation. For example, people and, in fact, all living beings, have always had to choose between their routine and alternative habitats, shelters, occupations, tasks, strategies / tactics, groups, partners, foods etc., and getting these choices right has always been tough but important to survive and thrive. To further illustrate by reference to psychological science in 2017: Should we replicate more old or discover more new findings? Should we stay with $p < .05$ or go with $p < .005$? Fisher or Bayes statistics? Should we keep publishing in journals or move on to posting our papers online? As these examples show, sometimes exploitation is better, while at other times exploration is better.

Back to B: Our argument is that minding others' B informs the self about where to find reasons and opportunities for collaborative exploitation (conservatives) versus exploration (progressives). In other words, the purpose and benefit of minding B could be guidance in adaptively balancing exploitation and exploration. To show this, people first played one of two games. The first game – the Balloon Analogue Risk Task (Lejuez et al., 2002) – is a process-pure measure of choosing safe versus risky options. People earned a point each time they further inflated a balloon. The balloon burst at some point, however. If people stopped inflating before it burst, they kept their points. If it burst, they lost all points. In the exploitation condition, people learned that the balloon bursts early such that it is best to play it safe (i.e., exploitation). In the exploration condition, they learned that the balloon bursts late such that it is advisable to take some risk (i.e., exploration). The second game – a modification of the Iowa Gambling Task (Bechara, Damasio, Damasio, & Anderson, 1994) – is a process-pure measure of choosing routine versus alternative options. People drew ten cards (the cards were points or blanks) from a routine deck and then drew 40 cards from either the routine deck or four alternative decks. In the exploitation condition, people learned that the routine deck has the highest probability of earning a point (i.e., exploitation was superior). In the exploration condition, they learned that the most rewarding deck is among the four alternatives (i.e., exploration was required).

After playing the balloon or card game, people indicated their willingness to delegate earning points in the game to members of stereotypically conservative (e.g., elderly person) and progressive (e.g., environmentalist) groups (see Koch et al., 2016a, Tables 1, 5, and 6). As predicted, when people had learned that exploitation (exploration) is the best game strategy, they preferred to delegate to members of stereotypically conservative (progressive) groups. Next, we replicated this interaction of requirement (exploitation vs. exploration) and opportunity (conservative vs. progressive B) with individuals as targets. After playing the balloon or card game, people inspected the profile of other players one at a time. Each profile

showed self-rated sex, age, and A, B, and C on 0-100 scales. For each profile, people either

pocketed points or chose to bet these points on the respective player's game performance

(below vs. above median; there was no feedback) for twice as many points. As predicted,

having learned that exploitation is required people bet that conservative and progressive

players had performed above and below median, respectively. When exploration was

required, however, they bet the reverse. That is, despite the availability of four other often

relevant cues (sex, age, and the Big Two; the five cues did not correlate with one another)

people spontaneously relied on players' B to bet whether they would succeed or fail in

situations that require pure exploitation or pure exploration. We replicated this effect with

people betting real money instead of points. Interestingly, more conservative and progressive

people actually performed better in the exploitation and exploration condition of both games,

respectively, suggesting that B is a valid cue for behavioral exploitation-exploration. In sum,

12 studies ($N > 1,000$) showed that one purpose and benefit of minding B is guidance in

solving the trade-off between exploitation and exploration (Koch, Imhoff, Dotsch, Unkelbach,

& Alves, 2017b). This clarification of the goal-relevance and functionality of B information

further supported that B qualifies as a third fundamental content dimension.

Communion increases with perceiver-target similarity in agency and beliefs

As outlined above, we found evidence that people spontaneously use A and B but not

C / warmth / morality for differentiating social groups, job groups, and U.S. states. This was

highly unexpected, as C has been argued to have higher processing priority than A (Abele &

Bruckmüller, 2011), for example because evaluating others' intentions (good vs. bad, i.e., C /

warmth) is more important than estimating the likelihood that they realize them (i.e., A /

competence, see Fiske, this volume).

We reconsidered C by modeling it as centrality (i.e., not as a dimension) in our

similarity maps best described by A and B (e.g., Figure 1). In all studies reported by Koch and

colleagues (2016a), social groups' mean C predicted groups' proximity to the center of their

similarity map (e.g., $r = .60$ in Figure 1). This suggested that while people do not

spontaneously use C to differentiate groups, C follows, and thus people infer it, from A and B

in a curvilinear fashion. According to this curvilinear relation, social entities perceived as

more average in A and B are inferred to be more communal (higher in C), whereas perceived

extremeness in A and / or B leads to inferences of low C, resulting in a two-dimensional

ABC model of fundamental meaning. C peaking at average AB was reminiscent of the more

general curvilinear relation between content and evaluation (on every evaluatively relevant

dimension, an intermediate range of positive quantities is flanked by the two negative ranges

of insufficiency and excess, see Grant & Schwartz, 2011). Further, C peaking at average AB

was consistent with that people seen as more likable (~ higher in C) are seen as more similar

to one another (Alves, Koch, Unkelbach, 2016; Koch et al., 2016b), and with that people seen

as more similar to one another are seen as more likable (Alves, Koch, Unkelbach, 2017a).

This higher similarity of positive compared to negative social entities is consequential

because similarity influences many levels of processing (Alves, Koch, Unkelbach, 2017b)

including categorization, generalization, and recognition (Alves et al., 2016).

Assuming that most people see the self as average in A, Imhoff & Koch (2017)

theorized that groups and persons seen as more average in A possibly receive higher mean

ratings in C because they are seen as more similar to the self by most people. This

'similarity breeds trust / liking' explanation had important implications. If C increases with

perceiver-target similarity in A, perceivers who see the self as low, average, and high in A

should disagree on targets' C, and the relation between targets' A and C should actually

not be curvilinear for everybody but negative and positive for perceivers who see the self as

low and high in A, respectively. So, inconsistent with the original ABC model of

fundamental meaning, the relation between targets' A and C might depend on perceivers' A,

but Koch and colleagues (2016a) overlooked this controversy because they had analyzed

mean rather than individual A and C ratings. The same might have been the case for the relation between targets' B and C. We tested this next.

In four studies ($N \sim 1,000$) conducted in the U.S., Germany, India, and South Africa, people rated psychologically prevalent groups on A, B, or C twice, allowing to decompose the total A, B, and C variance into three distinct shares: Differences between groups that people agreed on (consensus), group-unspecific differences between people (controversy #1), and group-specific differences between people (controversy #2). As predicted, people disagreed on groups' C (controversies #1 and #2 together accounted for 85% of the total C variance) but not so much A and B (controversies #1 and #2: 49% and 55% of the total A and B variance, respectively). In four additional studies ($N \sim 1,000$), U.S. Americans rated psychologically prevalent U.S. groups on A, B, and C. We explained groups' C by groups' A and B, people's self-rated A and B, and the interactions target A*perceiver A and target B*perceiver B. The two interaction terms were significant, sizable, and supported our updated theorizing that targets' C increases with perceiver-target similarity in A and B. As predicted, for perceivers low (high) in A the relation between targets' A and C was negative (positive). Likewise, for perceivers conservative (progressive) in B the relation between targets' progressiveness and C was negative (positive [see also Brandt, 2017]).

In sum, reexamining the nature and relation of prioritized dimension, we took a data-driven approach, focused on social groups as targets, and advanced our knowledge in three steps. First, we rediscovered B and found that A and B are orthogonal dimensions. Second, we found that across perceivers of all kinds, targets' C increased with their averageness in A and B, respectively (Koch et al., 2016a). And third, impressions of C turned out to increase with perceiver-target similarity in A and B. Thus, C peaking for targets average in A and B only applied for perceivers who themselves were average in A and B. For perceivers extreme in A and / or B, C instead peaked for targets extreme in A and / or B in the same way as the respective perceiver (e.g., perceivers conservative in B trusted the most in

targets also conservative in B, see Figure 2). We revised the ABC model accordingly,

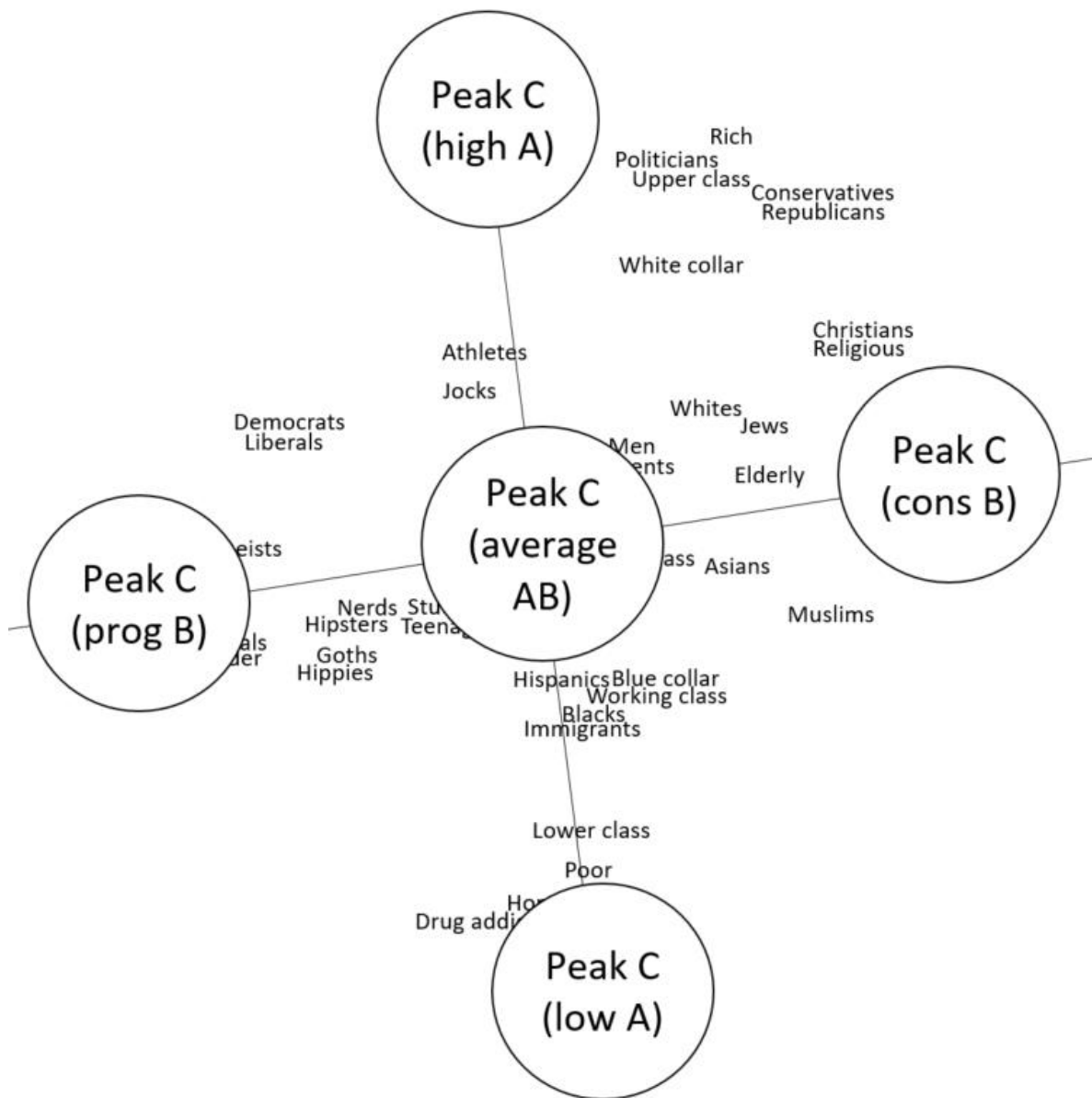concluding that there is controversy on C (Koch et al., 2017b).

Figure 2.

People spontaneously use A, B, and C to make sense of the social world

Our second and so far most recent revision of the ABC model concerns the

spontaneous usage of C for mentally organizing social entities. At first (see Figure 1), we did

not find evidence that people spontaneously use C to spatially arrange social groups etc.

based on their similarity (Imhoff et al., 2017; Koch et al., 2016a; Koch et al., in press). This, however, turned out to be an artifact of analyzing mean rather than individual data.

Koch and colleagues (2016a), for example, predicted social groups' mean C ratings from the groups' x- and y-coordinates in people's mean similarity map (i.e., people's mean spatial arrangement solution). However, people disagree on groups' C (Koch et al., 2017b). Thus, aggregating C ratings across people separately for each group leveled out a lot of within-person variance in groups' C (e.g., person 1 trusts Democrats but not Republicans, whereas person 2 trusts Republicans but not Democrats; aggregating C ratings across persons 1 and 2, the two groups will appear equally trusted), possibly obscuring people's spontaneous usage of C (i.e., little variance in groups' mean C ratings, little covariance with the groups' coordinates in people's mean similarity map). Aggregating spatially arranged similarity across people separately for each unique pair of groups possibly also leveled out a lot of within-person variance in groups' C. For example, three persons spontaneously use C to judge three groups' similarity. Person 1 trusts athletes and gamers (distrusts politicians) and thus drags them to one end (the other end) of the screen, person 2 trusts athletes and politicians (distrusts gamers) and thus drags them to one end (the other end) of the screen, and person 3 trusts gamers and politicians (distrusts athletes) and thus drags them to one end (the other end) of the screen. Aggregated across persons 1-3, the three unique pairs of groups that can be formed with the groups will appear equally similar, again obscuring people's spontaneous usage of C (i.e., little variance in groups' mean pairwise similarity, little covariance with the groups' mean C ratings).

To test whether aggregating C ratings and spatial similarity arrangement across people obscured their spontaneous usage of C, in two new studies ($N \sim 400$) we circumnavigated aggregation by predicting groups (A, B, and) C as rated by single individuals by the groups' x- and y-coordinates in the same single individuals' spatial similarity arrangement map. Results confirmed that people spontaneously used A, B, *as well as C* to spatially arrange

the groups, a major step towards reconciling the ABC model (Koch et al., 2016a) with the

Big Two model (e.g., Fiske et al., 2002; Fiske, this volume) claiming that people prioritize

A and C to make sense of the social world. As we found that different people used different

combinations of dimensions, one important avenue for future research is to clarify when and

why people use A, B, and / or C to differentiate social groups, job groups etc.

Conclusion

We conclude five points: (1) In addition to agency and communion, a third prioritized

dimension is *beliefs ranging from conservative to progressive*. (2) Perceiving others as

conservative-progressive serves the purpose to *balance exploitation (routine, safe choices)*

and exploration (alternative, risky choices). (3) *Communion increases with perceiver-target*

similarity in agency and beliefs. Thus, the relation between targets' agency and communion is

negative, curvilinear, and positive for perceivers low, average, and high in agency,

respectively. Likewise, the relation between targets' progressiveness and communion is

negative, curvilinear, and positive for perceivers conservative, neutral, and progressive in

beliefs, respectively. As a result, there is *controversy on who is communal*. (4) People

spontaneously use A, B, and C to mentally organize and compare targets. (5) Points 3 and 4

resulted from an ongoing collaboration with Susan Fiske's lab at Princeton University and

Vincent Yzerbyt's lab at the Catholic University Louvain-la-Neuve. We are thankful for their

insightful input and look forward to further reexaminations of the nature and relation of

fundamental dimensions of meaning.

References

Abele, A. E., & Bruckmüller, S. (2011). The bigger one of the "Big Two"? Preferential

   processing of communal information. *Journal of Experimental Social Psychology*, *47*,

   935-948.

Abele, A. E. & Wojciszke, B. (2007). Agency and communion from the perspective of self

   versus others. *Journal of Personality and Social Psychology, 93*, 751-763.

Abele, A. E., & Wojciszke, B. (2014). Communal and agentic content in social cognition: a

   dual perspective model. *Advances in Experimental Social Psychology, 50*, 195-255.

Alves, H., Koch, A. S., & Unkelbach, C. (2016). My friends are all alike — the relation

   between liking and perceived similarity in person perception. *Journal of Experimental

   Social Psychology*, *62*, 103–117.

Alves, H., Koch, A., & Unkelbach, C. (2017a). The "common good" phenomenon: Why

   similarities are positive and differences are negative. *Journal of Experimental

   Psychology: General*, *146*, 512–528.

Alves, H., Koch, A. S., & Unkelbach, C. (2017b). Why good is more alike than bad:

   Processing implications. *Trends in Cognitive Sciences*, *21*, 72–82.

Alves, H., Unkelbach, C., Burghardt, J., Koch, A. S., Krüger, T., & Becker, V. D. (2015). A

   density explanation of valence asymmetries in recognition memory. *Memory &

   Cognition*, *43*, 896–909.

Bechara, A., Damasio, A. R., Damasio, H., & Anderson, S. W. (1994). Insensitivity to future

   consequences following damage to human prefrontal cortex. *Cognition*, *50*, 7-15.

Brandt, M. J. (2017). Predicting ideological prejudice. *Psychological Science*, *28*, 713-722.

Brunswik, E. (1955). Representative design and probabilistic theory in a functional

   psychology. *Psychological Review*, *62*, 193-217.

Cislak, A., & Wojciszke, B. (2008). Agency and communion are inferred from actions serving

   interests of self or others. *European Journal of Social Psychology*, *38*, 1103-1110.

Fiske, S. T., Cuddy, A. J., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology, 82*, 878-902.

Gebauer, J. E., Sedikides, C., Verplanken, B., & Maio, G. R. (2012). Communal narcissism. *Journal of Personality and Social Psychology*, *103*(5), 854-878.

Grant, A. M., & Schwartz, B. (2011). Too much of a good thing: The challenge and opportunity of the inverted U. *Perspectives on Psychological Science*, *6*, 61-76.

Hibbing, J. R., Smith, K. B., & Alford, J. R. (2014). Differences in negativity bias underlie variations in political ideology. *Behavioral and Brain Sciences*, *37*, 297-307.

Hout, M. C., Papesh, M. H., & Goldinger, S. D. (2013). Multidimensional scaling. *Wiley Interdisciplinary Reviews: Cognitive Science*, *4*, 93-103.

Imhoff, R., & Koch, A. (2017). How orthogonal are the Big Two of social perception? On the curvilinear relation between agency and communion. *Perspectives on Psychological Science*, 12, 122–137.

Imhoff, R., Koch, A., Flade, F. (2017). (Pre)occupations: A data-driven map of job stereotypes and their consequences for categorization and evaluation. *In preparation.*

Jones, R. A., & Ashmore, R. D. (1973). The structure of intergroup perception: categories and dimensions in views of ethnic groups and adjectives used in stereotype research. *Journal of Personality and Social Psychology, 25*, 428-438.

Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political ideology: Its structure, functions, and elective affinities. *Annual Review of Psychology, 60,* 307-337.

Koch, A., Alves, H., Krüger, T., & Unkelbach, C. (2016b). A general valence asymmetry in similarity: Good is more alike than bad. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *42*, 1171–1192.

Koch, A., Imhoff, R., Dotsch, R., Unkelbach, C., & Alves, H. (2016a). The ABC of

stereotypes about groups: Agency/socioeconomic success, conservative–progressive

beliefs, and communion. *Journal of Personality and Social Psychology*, 110, 675–709.

Koch, A., Imhoff, R., Dotsch, R., Unkelbach, C., & Alves, H. (2017a). Minding conservative-

progressive beliefs is for balancing exploitation and exploration. *In preparation.*

Koch, A., Kervyn, N., Kervyn, M., & Imhoff, R. (in press). Studying the cognitive map of the

U.S. states: Ideology and prosperity stereotypes predict interstate prejudice. *Social

Psychological and Personality Science*.

Koch, A., Nicolas, G., Imhoff, R., Unkelbach, C., Terache, J., Yzerbyt, V., & Fiske, S.

(2017b). Stereotypes about groups' communion / warmth are not consensual:

Implications for reconciling the ABC of stereotypes with the SCM. *In preparation.*

Lejuez, C. W., Read, J. P., Kahler, C. W., Richards, J. B., Ramsey, S. E., Stuart, G. L., ... &

Brown, R. A. (2002). Evaluation of a behavioral measure of risk taking: the Balloon

Analogue Risk Task (BART). *Journal of Experimental Psychology: Applied*, 8, 75-84.

Lammers, J., Koch, A., Conway, P., & Brandt, M. J. (in press). The Political Domain Appears

Simpler to the Politically Extreme Than to Political Moderates. *Social Psychological

and Personality Science*.

Pattyn, S., Rosseel, Y., & Van Hiel, A. (2013). Finding our way in the social world: exploring

the dimensions underlying social classification. *Social Psychology, 44*, 329-348.

Peabody, D. (1985). National characteristics. Cambridge: Cambridge University Press.

Peeters, G. (2008). The evaluative face of a descriptive model: Communion and agency in

Peabody's tetradic model of trait organization. *European Journal of Social

Psychology*, 38, 1066-1072.

Schwartz, S. H., & Bilsky, W. (1987). Toward a universal psychological structure of human

values. *Journal of Personality and Social Psychology, 53*, 550-562.

Sczesny, S. (2003). A closer look beneath the surface: Various facets of the think-manager–

 think-male stereotype. *Sex Roles*, *49*(7-8), 353-363.

Tversky, A. (1977). Features of similarity. *Psychological Review*, *84*, 327-352.

Wojciszke, B., Baryla, W., Parzuchowski, M., Szymkow, A., & Abele, A. E. (2011). Self-

 esteem is dominated by agentic over communal information. *European Journal of*

 Social Psychology, *41*, 617-627.

Ybarra, O., Chan, E., Park, H., Burnstein, E., Monin, B., & Stanik, C. (2008). Life's recurring

 challenges and the fundamental dimensions: An integration and its implications for

 cultural differences and similarities. *European Journal of Social Psychology*, *38*,

 1083-1092.