Journal of Experimental Social Psychology 45 (2009) 515–523

Contents lists available at ScienceDirect

Journal of Experimental Social Psychology

journal homepage: www.elsevier.com/locate/jesp

Seeing close others as we see ourselves: One's own self-complexity is reflected in perceptions of meaningful others

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ARTICLE INFO

Article history:
Received 14 May 2008
Revised 26 January 2009
Available online 20 February 2009

Keywords:
Self-complexity
Relationships
Cognitive complexity
Self-concept
Mental representations

ABSTRACT

Although past research has established a correspondence between the content of knowledge about the self and close others, the current work evaluated the prediction that the self-concept also influences the structure of these perceptions. Specifically, we expected greater correspondence in the complexity of mental representations between the self and others included in the self. In Study 1, we found that self-complexity was related to the perceived complexity of a close other and that this outcome did not reflect a general tendency to perceive the world in a systematically complex or simple fashion (i.e., cognitive complexity). In Study 2, we found that the correspondence between self-complexity and complexity of representations of others increased for individuals more included in the self. Finally in Study 3, we observed that experimentally manipulating inclusion of other in the self resulted in perceived structural similarity between representations of the self and others. Implications of self-concept representation for social relationships are discussed.

People have a pervasive drive to form and maintain close, meaningful social relationships. According to some theorists, this motivation to connect and affiliate with others is a basic need essential for our well-being and happiness (e.g., Baumeister & Leary, 1995). Typically, only a few people provide the close, positive relationships that satisfy our affiliation needs. Importantly, these people do more than merely fulfill roles. Specifically, they become part of our identity and history, essentially becoming linked to the self (e.g., Andersen, Chen, & Miranda, 2002; Aron, Aron, Tudor, & Nelson, 1991; Kumashiro & Sedikides, 2005; Oatley, Keltner, & Jenkins, 2006).

Indeed, a considerable amount of research has concluded that meaningful social groups (e.g., Smith & Henry, 1996) and individuals (e.g., Aron et al., 1991) become integrated into one's representation of the self. For example, a common measure of relationship closeness, the Inclusion of Other in Self (IOS) scale devised by Aron, Aron, and Smollan (1992), asks individuals to indicate the extent to which another person is included in one's self-concept by reporting which of a series of overlapping circles best represents the degree to which another (one circle) is included in the self (the other circle). Greater inclusion of a relationship partner in one's self (i.e., selecting circles with greater overlap) has been shown to predict the duration, commitment, and intimacy of the relationship (Aron et al., 1992).

Further, including close others in the self has consequences for mental representations of both the self and meaningful others. For example, Aron et al. (1991) observed that participants were faster to judge the self-descriptiveness of traits when those traits were reported as descriptive of one's spouse (who presumably was one of the most meaningful others to the participants) than when they were not descriptive of one's spouse. In addition, participants were more likely to incorrectly label a trait as self-descriptive when the trait was descriptive of one's spouse but not oneself, suggesting that the cognitive integration of self and spouse resulted in misperceiving a spouse's attributes as being one's own. Similar findings are obtained when judging the self-descriptiveness of traits shared with one's in-group, such that self-descriptiveness judgments are faster for traits shared with one's in-group than for traits descriptive of oneself but not of the in-group (e.g., Coats, Smith, Claypool, & Banner, 2000; Smith & Henry, 1996).

Smith, Coats, and Walling (1999) explain these outcomes by proposing that when a meaningful partner (or group) is included in one's sense of self, the partner concept (or group concept) becomes associated with the self-concept in memory. For instance, a trait that is descriptive of both one's partner and one's self will be positively associated with both partner and self-concepts in memory, and over time these connections will lead the trait concept to receive greater activation compared to a trait that is only linked to either the self or one's partner. Such frequent activation should lead the shared (*matched*) trait to become relatively more accessible, facilitating the speed with which judgments of the trait are rendered. This is consistent with Andersen and colleagues' (2002) theory of the relational self, which assumes that knowledge of the self and of significant others are linked in mem-

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doi:10.1016/j.jesp.2009.02.005

ory, resulting in increased accessibility of the significant-other representation.

Thus, there is considerable evidence that as the representations of self and meaningful others become more integrated, information associated with one influences perceptions of the other. Interestingly, similar effects occur just for the mere act of taking another person's perspective. Specifically, Davis, Conklin, Smith, and Luce (1996) found that taking the perspective of another person increases the overlap between mental representations of that person and the self, leading one to perceive that the other person possesses self-descriptive traits as well.

Content vs. structure

The aforementioned research demonstrates that knowledge about the self and meaningful others mutually influence each other. However, past work in this domain has almost exclusively focused on the *content* of mental representations that overlap with the self. That is, past research has focused on how the traits descriptive of the self become part of the mental representations of close others. Because of the pervasive impact of the self on social perception (for reviews, Dunning, 2003; Sedikides, 2003), especially for targets included in the self, it seems likely that one's self-concept may influence more than just the content of overlapping mental representations. Specifically, we propose that there will be *structural* similarity between the representations of self and meaningful others included in the self. In other words, the actual organization of the self-concept, and not just the traits associated with it, may influence the structure of mental representations of others who are included in the self. The current research explores this hypothesis.

Although there are a number of ways that one could consider the cognitive structure of representations of the self and others, we drew upon the self-complexity literature in the current work (for reviews, McConnell & Strain, 2007; Rafaeli-Mor & Steinberg, 2002). Self-complexity refers to the number of self-aspects (e.g., roles, goal selves) an individual has and the redundancy in attributes (typically viewed as traits) descriptive of these self-aspects, with self-complexity increasing as the number of self-aspects and the uniqueness of their attributes increase. Those lower in self-complexity have been found to experience stronger affective reactions to feedback and greater mood fluctuations across time (Linville, 1985), faster escape from self-awareness following failure (Dixon & Baumeister, 1991), greater reliance on their feelings in guiding their behaviors (Brown & McConnell, in press), and greater difficulty in effectively engaging in mental regulation (Renaud & McConnell, 2002). These effects occur because a more simplified self-concept structure (i.e., having fewer self-aspects with more interconnections via shared trait associations in memory) intensifies the impact of self-relevant experiences, highlighting the importance of the structure of self-concept organization (McConnell & Strain, 2007).

Because including others in the self-concept affects the mental representation of traits ascribed to them (Aron et al., 1991; Smith et al., 1999), we reasoned that it would also affect the structure of the mental representation of the other. In other words, one's own self-complexity should influence the perceived complexity of people included in one's self. Why would this be the case? To the extent that others are included in one's self-concept representation, there may be some degree of alignment in representational structures (much like the attitudinal alignment that occurs with close others; Davis & Rusbult, 2001). Including another in the self means that "the cognitive representations of self and other overlap" (Aron, 2003; p. 444), and accordingly, the structure of a mental representation of a close other should be compatible with self-knowledge in order for this inclusion to occur. As a result, we would anticipate greater correspondence between the complexity of one's own self-concept (i.e., self-complexity) and the representations of others (i.e., other complexity) for those viewed as more included in one's sense of self.

In other words, it is possible that the self is used as a reference point for perceiving meaningful others, such that its organizational structure is applied to the mental representations of others who become included in it. Although considerable research shows that characteristics of the self influence how others are perceived and evaluated (see Dunning, 2003), we propose that the organizational structure of the self should only affect perceptions of those included in the self. Importantly, demonstrating these outcomes would extend past work focusing on *content* (e.g., trait) similarity between the self and others included in the self (e.g., Davis et al., 1996) by demonstrating that there is *structural* similarity in such mental representations as well.

Although observing such a correspondence (i.e., positive relations between self-complexity and complexity of meaningful others) would provide good support for our prediction, it is important to examine these issues experimentally to reduce the likelihood that other factors could account for such a relation. For example, if structural similarity between the self and close others is found, it may be a consequence of a general tendency to structure one's mental representations of the world at large in a particular way rather than the self influencing perceptions of others (e.g., Karniol, 2003). In other words, a person's general cognitive complexity may lead them to perceive themselves and others with a similar level of complexity.

In the current work, we evaluated the proposal that there will be structural similarity between the self-concept and representations of others included in the self in three studies. First, we sought to establish that self-complexity was related to the perceived complexity of a close other and that this was not merely a by-product of a general tendency to perceive the world in a complex or simple way (Study 1). Next, we tested the prediction that self-complexity would only be related to the perceived complexity of others who were included in the self (Study 2). Finally, we experimentally manipulated inclusion of other in self to observe its effect on the relation between self-complexity and perceived complexity of another person to demonstrate the causal role of inclusion in self (Study 3).

Study 1

Overview

Aron et al. (1991) contend that close relationships are best understood as including the partner in the self. We first sought to establish that self-complexity is related to the perceived complexity of the individual's closest other (who, by nature of being the closest, should be most included in the individual's self-concept). Second, we assessed whether this might reflect a general tendency to perceive the world in a relatively complex or simple manner (i.e., generalized cognitive complexity) or if the relation between self-complexity and perceived complexity of one's closest other is unique.

Participants

Eighty-seven undergraduate students at Miami University participated in exchange for course credit.[1]

[1] Two participants were missing close other complexity data (they exited the computer program before completing the task) and four were missing data from the repertory grid (they did not finish the grid, making it impossible to calculate cognitive complexity scores for these particular measures). The rest of their data was used in analyses, with these valued listed as "missing". Excluding participants with partial data does not change the findings reported herein.

Measures

Self-complexity

Self-complexity was assessed using a computer program implementation of Linville's (1985) self-complexity trait-sorting task (see McConnell et al., 2005). Participants were provided with a list of 20 positive and 20 negative attributes that are commonly used by college students to describe themselves (Showers, 1992). They put the attributes into groups (i.e., self-aspects) that represented meaningful aspects of their lives. Further, they were told that they did not have to use all of the attributes provided, that attributes could be used in more than one group, and that they should stop if they felt they were straining to generate more groups.

Self-complexity was calculated using the H statistic (Scott, 1969), which captures both the number of self-aspects (i.e., groups) and the redundancy of attributes across the self-aspects:

$$H = \log_2 n - \left(\sum_i n_i \log_2 n_i\right) \Big/ n,$$

where n is the total number of attributes available to the participant (40) and n_i is the number of attributes present within each particular group combination (i) across the participant's reported self-aspects (for extensive discussion, see Linville, 1987; Schleicher & McConnell, 2005; Woolfolk, Novalany, Gara, Allen, & Polino, 1995).

Other complexity

The method used to assess perceived complexity of each participant's closest other was identical to the measure of self-complexity except that participants created groups of attributes to describe their closest other. Specifically, participants were instructed to think of the person closest to them (e.g., a best friend, family member, relationship partner, etc.) and to form groups of traits that go together, where each group of traits describes an aspect of that person's life. H was calculated to measure perceived complexity of this closest other.

Cognitive complexity

Although a number of different measures of cognitive complexity exist, relations among them are weak at best (Vannoy, 1965), and the calculation of relevant indices is somewhat circuitous. In fact, a factor analysis of more than a dozen measures of cognitive complexity did not reveal a single unitary factor, leading Vannoy to conclude that "cognitive complexity is not as general a trait as has sometimes been implied in the literature" (1965, p. 394). Although all measures of cognitive complexity assess how one perceives people and objects in one's environment, the factor analysis suggests that cognitive complexity is comprised of multiple (and sometimes independent) dimensions (Seaman & Koenig, 1974; Vannoy, 1965). For this reason, we employed three of the most commonly used approaches to cognitive complexity to cover as many dimensions as possible.

Seaman and Koenig's (1974) repertory grid. Seaman and Koenig (1974) developed a repertory grid on which participants can compare the attributes of people they know. This grid is based on a repertory grid measure of complexity originally created by Kelly (1955) and modified by Bieri (1955). Seaman and Koenig constructed this grid in response to Vannoy's (1965) finding that cognitive complexity is not a unitary trait. Specifically, rather than selecting a single measure of cognitive complexity from the multitude available, the grid is designed such that three different measures of cognitive complexity can be generated simultaneously from the same data set.

In this task, participants select eight different people, one for each of the following role categories: (a) closest friend of the same sex as yourself, (b) person of the opposite sex you find hard to like, (c) a friend you admire of the same sex as yourself, (d) person of the same sex with whom you feel most uncomfortable, (e) closest friend of the opposite sex (or spouse/significant other), (f) person of the same sex you find hard to like, (g) a friend you admire of the opposite sex, and (h) person of the opposite sex with whom you feel most uncomfortable.

After selecting the people who satisfied these roles, participants wrote each person's initials in the column headings of a grid, and then rated them on the following dimensions using a 1–6 scale: Shy (1)–Outgoing (6), Maladjusted (1)–Adjusted (6), Indecisive (1)–Decisive (6), Unfriendly (1)–Friendly (6), Self-absorbed (1)–Interested in others (6), Ill-humored (1)–Cheerful (6), Submissive (1)–Dominant (6), Inconsiderate (1)–Considerate (6). Participants recorded their ratings inside the grid (printed on a single sheet of paper) for each of the eight target individuals.

The data from this grid can be used to compute multiple indices of cognitive complexity (each developed by different researchers). Scott's H was calculated by using each dimension (e.g., outgoing) as a group comprised of people who score positively on that dimension, with greater H scores indicating greater cognitive complexity. Specifically, if a participant indicated a score of four or above for a particular person on that dimension, then that person was included in the group. This meant that each participant had up to eight groups, one for each of the eight dimensions (e.g., unfriendly–friendly, self-absorbed-interested in others, ill-humored-cheerful, etc.). Each group could contain up to eight people. However, if a participant did not assign any of the eight people a score of four or above on a particular dimension, that dimension was excluded (resulting in less than eight groups). H was calculated from this group sort, with n as the total number of people available to the participant (8) and n_i as the number of people present within each particular group combination (i).

A second measure of cognitive complexity designed by Fiedler (1967) was also calculated using participants' responses to Seaman and Koenig's (1974) repertory grid. This measure consists of two separate indices that reflect cognitive complexity: most preferred person (MPP) and least preferred person (LPP). MPP is calculated by adding the eight dimension ratings for each positive person (i.e., the people selected for role categories a, c, e, and g in this repertory grid; see above) and then summing these totals. The greater the MPP score, the more "polarized" participants' perceptions of positive individuals and thus the lower their cognitive complexity (i.e., they view positive individuals as possessing only positive traits, suggesting they perceive others in a simple manner). LPP was similarly calculated by adding the eight ratings for each negative person (i.e., role categories b, d, f, and h), which were then summed to form the participant's LPP score. Lower LPP scores indicated that negative people were viewed as possessing mostly negative traits, reflecting less cognitive complexity. In contrast, cognitively complex people recognize that disliked individuals are not negative in every way and thus have larger LPP scores.

A third measure of cognitive complexity calculated from grid responses was proposed by Bieri et al. (1966). In this measure, the number of "tied ratings" is calculated for each target person. That is, for each column (which represents one target person), the total number of ties are counted. For example, if "4" appears twice in the same column, then there are two ties. If "4" appears four times, there are six ties (all possible dyads). The number of ties was calculated for each column (target person), which in turn were summed across all eight target individuals to produce an index of Total Cognitive Complexity (TCC). More ties presumably reflect less diversity in social ratings (i.e., a more simplified impression), and thus greater TCC scores indicate *lower* cognitive complexity because it reflects greater use of the same responses within and among target individuals.

Mayo and Crockett's (1964) measure of cognitive complexity. Mayo and Crockett's (1964) measure of cognitive complexity is similar to Seaman and Koenig's (1974) but differs in content and the resulting statistical computation. This measure, described in Mayo and Crockett (1964), is also adapted from Kelly's (1955) Role Construct Repertory Test.

As in Seaman and Koenig's measure, participants are asked to think of individuals who fit the following eight roles, selecting a different person for each role: (a) a teacher who is well liked, (b) a teacher who is generally disliked, (c) a girl friend, (d) a boy friend, (e) a person who appears to meet the highest ethical standards, (f) a person who has acted dishonestly toward others, (g) a person whom you have recently met and would like to know better, and (h) a person with whom most people feel uncomfortable.

After selecting a person for each of the eight roles, participants were presented with five triads using the people they selected: (Triad A) liked teacher, disliked teacher, and girl friend; (Triad B) disliked teacher, girl friend, and boy friend; (Triad C) dishonest person, person want to know better, and person uncomfortable with; (Triad D) liked teacher, boy friend, and ethical person; and (Triad E) ethical person, person want to know better and person uncomfortable with.

For each of these triads, participants were asked to write (open-ended, on one line) how persons 1 and 2 are similar/different from person 3, how persons 2 and 3 are similar/different from person 1, and how persons 1 and 3 are similar/different from person 2. Thus, participants made 15 comparisons, 3 for each of the five triads. Cognitive complexity was measured by the sum of unique attributes (e.g., a personality trait, age, and hometown) generated by the participant across the 15 comparisons, with more unique constructs (i.e., seeing a variety of ways in which people can be compared) indicating more cognitive complexity.

Scott's (1962) measure of cognitive complexity. The *H* statistic was used to measure cognitive complexity on yet another task developed by Scott (1962). Specifically, participants were asked to think of as many countries as they could and to create groups of countries that they believed belonged together for a reason that was important to them. After doing this, the experimenter gave participants a list of 26 countries and asked them to create a new set of groups using this particular list of countries (again, putting them into groups representing meaningful combinations of countries). Finally, participants were asked to return to the groups they had generated using their own list of countries, and to consider if there were any countries from the new list given to them by the experimenter that they might like to add to their original groups. If there were, participants were asked to add the new countries to their pre-existing groups. If not, participants could move on to the next task. Scott's *H* was calculated for each of the first two groupings (participants' original groups using their self-generated list of countries and their new groups using only the list provided by the experimenter); in computing H, n was the total number of countries to be grouped (i.e., the number of countries a particular participant generated for the first list; 26 for the experimenter's list) and n_i was the number of countries present within each particular group combination (i). These scores represent two additional measures of cognitive complexity, with larger *H* scores indicating greater cognitive complexity.

Procedure

The experiment consisted of two experimental sessions separated by at least one day. At Session 1, participants completed the self-complexity task. At Session 2, they completed the measures of other complexity and cognitive complexity. Because of the large number of tasks involved, we used partial counterbalancing and created 20 unique task orders. In both sessions, participants completed all of the measures in a private room.

Results and discussion

As anticipated, self-complexity was positively correlated with close other complexity, $r = .36$, $p < .01$. On the other hand, self-complexity was unrelated to any measures of cognitive complexity, $rs < .17$, *ns*. As Table 1 reveals, there were a number of correlations among the measures of cognitive complexity, with the exception of Mayo and Crockett's (1964) measure of cognitive complexity, which did not correlate with any others.

Importantly, the three measures of cognitive complexity using Scott's *H* (the first country sort, the second country sort, and *H* based on Seaman and Koenig's repertory grid) all correlated with one another. To ensure that the relation between self-complexity and close other complexity was independent of cognitive complexity, we regressed close other complexity onto self-complexity and the three *H* indices of cognitive complexity. The partial correlation between self-complexity and close other complexity remained significant, revealing that self-complexity significantly predicted close other complexity even after controlling for the three measures of cognitive complexity relying on the *H* statistic (which, conceptually, were most similar to the self-complexity and other complexity measures), *partial* $r = .31$, $p < .01$.[2]

Overall, Study 1 established that self-complexity and perceived complexity of one's closest other were related, and that this relation was independent of any general tendency to perceive the world in a complex or simple manner. However, this initial demonstration leaves some questions unaddressed. For instance, we did not directly measure the extent to which participants included their closest other in their self. Instead, we simply asked participants to consider their closest other. Additionally, we did not measure perceived complexity of others not included in the self, making it possible that self-complexity predicts complexity of all social targets. Alternatively, the correspondence between self-complexity and close other complexity may be an artifact of using identical measures. Studies 2 and 3 address these potential limitations and provide more direct tests of our primary prediction that including others in one's self-representation results in a *structural* overlap between the mental representation of the self and the other.

Study 2

Overview

Having established that there is a correspondence between self-complexity and close other complexity independent of general cognitive complexity, we sought to provide better evidence that the relation between self-complexity and close other complexity reflects the extent to which others are included in the participant's self-concept. In this study, we considered four targets who should vary in IOS (in descending order): Closest other, friend, acquaintance, and George Washington. Participants completed a measure of IOS and perceived complexity for each of these four targets.

These specific targets were selected for several reasons. By comparing participants' self-complexity to their perceived complexity of friends and acquaintances, we can establish if the structural similarity between self and close other complexity is a unique phenomenon or if it represents a more general tendency to see social

[2] The partial correlation between self-complexity and close other complexity is unchanged if each cognitive complexity measure is controlled for separately: Controlling for country sort #1, *partial* $r = .35$, $p < .01$; controlling for country sort #2, *partial* $r = .33$, $p < .01$, controlling for Seaman and Koenig's *H*, *partial* $r = .35$, $p < .01$.

Table 1
Correlations between self-complexity, close other complexity, and multiple measures of cognitive complexity in Study 1.

	SC	COC	CS #1	CS #2	S and KH	LPP	MPP	TCC	M and C
Self-complexity	–	.36**	.15	.16	.02	.01	.02	−.02	.05
Close other complexity	–	–	.22*	.28*	−.04	−.23*	.06	.06	.21
Scott country sort #1	–	–	–	.66**	.27**	−.23*	−.11	−.17	.10
Scott country sort #2	–	–	–	–	.24*	−.27*	−.14	−.13	.06
Seaman and Koenig, *H*	–	–	–	–	–	−.53**	−.63**	−.61**	.01
Seaman & Koenig, LPP	–	–	–	–	–	–	.40**	.35**	−.08
Seaman and Koenig, MPP	–	–	–	–	–	–	–	.56**	.07
Seaman and Koenig, TCC	–	–	–	–	–	–	–	–	.01
Mayo and Crockett	–	–	–	–	–	–	–	–	–

* $p < .05$.
** $p < .01$.

targets as similar to the self. As with participants' closest other, friends and acquaintances are positive social targets that participants have interacted with on multiple occasions, however because these relationships are less close, they should also be less included in the self. George Washington was selected as an additional comparison target because he is someone who all participants know to a similar degree and presumably view in a positive light (similar to one's closest other or friend), but he should not be included in participants' self-concepts because they do not have a personal relationship with him. Thus, assessing the similarity between participants' self-complexity and perceived complexity of these targets should reveal if inclusion of other in self in particular plays a role in perceived structural similarity.

Participants

Twenty Miami University undergraduates received course credit for their participation.

Measures

Complexity measures

Self-complexity and other complexity were assessed in the same manner as in Study 1 with only one change. In the current study, participants were provided with a list of 60 (instead of 40) attributes to use when describing themselves and others in order to increase the generalizability of the findings. Previous work using varying lists of attributes in self-complexity tasks has found that different trait lists do not qualify the results obtained (e.g., McConnell et al., 2005; Woolfolk et al., 1995.)

Participants completed four measures of other complexity, one for each target: Their closest other (instructions were the same as in Study 1), a friend (described as someone who is more than an acquaintance but not the participant's best or closest friend), an acquaintance (described as someone who the participant sometimes meets or associates with, but with whom the participant is not a close friend), and George Washington.

Inclusion of other in self

The extent to which each target was included in participants' sense of self was measured using the IOS scale by Aron et al. (1992). Participants were shown seven pairs of circles (Venn diagrams) that varied in the extent to which they overlapped, from circles that were completely independent and non-overlapping to circles that overlapped almost entirely. Participants were told that the figures represented varying amounts of overlap between themselves and the other person and that they should indicate which figure best reflects the extent to which that person is part of their sense of self. Each pair of circles was associated with a number from 1 to 7, with larger numbers reflecting greater overlap (i.e., more inclusion in the self). Participants recorded the extent to which each of the four targets was perceived to be a part of their self.

Procedure

Study 2 was conducted in two sessions. At Session 1, participants completed the measure of self-complexity. At Session 2 (which took place at least one day later), they completed the other complexity measures for each of the four targets in a counterbalanced order. At the end of the study, participants completed the IOS measure for each of the four targets.

Results

Manipulation check

A repeated measures ANOVA comparing IOS scores across the four targets revealed that, as expected, the four targets differed in the extent to which participants considered them to be included in their self, $F(3,17) = 29.81$, $p < .001$. As Table 2 reveals, the closest other was most included in participants' selves, followed by the friend, with the acquaintance and George Washington being least included in participants' selves. IOS scores for the closest other were significantly different from all other targets (friend $t(19) = 3.62$, $p < .01$; acquaintance $t(19) = 8.62$, $p < .001$; George Washington $t(19) = 6.58$, $p < .001$). IOS scores for the friend were significantly different from that of the acquaintance ($t(19) = 3.43$, $p < .01$) and George Washington ($t(19) = 5.94$, $p < .001$), but IOS scores for the acquaintance and George Washington did not differ ($t(19) = .65$, *ns*).

Correspondence between self-complexity and other complexity

The correspondence between self-complexity and other complexity was computed for each target by calculating the absolute difference score between self-complexity and other complexity, with smaller scores reflecting greater similarity in self-complexity and other complexity. A repeated measures ANOVA comparing the

Table 2
Average level of inclusion of other in self and absolute difference between self-complexity and other complexity in Study 2. Standard deviations are in parentheses.

	Close other	Friend	Acquaintance	George Washington
IOS score	5.65^{a}	4.25^{b}	2.65^{c}	2.30^{c}
	(1.14)	(1.16)	(1.76)	(1.56)
Absolute difference	$.21^{a}$	$.31^{ab}$	$.72^{c}$	$.47^{bc}$
	(.62)	(.64)	(.79)	(.86)

Note: Means in the same row with different superscripts are significantly different, $p < .05$.

absolute difference scores between self-complexity and other complexity across the four targets was significant, $F(3,17) = 7.19$, $p < .01$ (see Table 2). Paralleling the IOS score findings, the absolute difference between self-complexity and other complexity was smallest for the closest other, followed by the friend, with the acquaintance and George Washington showing the largest absolute difference scores. The discrepancy between self-complexity and other complexity for the closest other target was significantly smaller than when the target was an acquaintance ($t(19) = -4.22$, $p < .001$) or was George Washington ($t(19) = -2.38$, $p < .05$), but not when the target was a friend ($t(19) = -1.21$, $p = .24$). The discrepancy was also smaller when the target was a friend than when the target was an acquaintance ($t(19) = -4.07$, $p < .01$), but the discrepancy was only somewhat smaller for a friend than for George Washington ($t(19) = -1.35$, $p = .19$).

IOS and correspondence between self-complexity and other complexity

The above results are consistent with the prediction that perceived complexity of close others and friends correspond with self-complexity because close others and friends are relatively more included in the self. To further evaluate this interpretation, for each participant we computed the correlation between his or her absolute difference scores and IOS scores across all four targets. The average correlation between absolute difference scores and IOS scores across participants was $-.33$, which was significantly different from 0, $t(19) = -2.75$, $p < .05$. That is, across targets, those who were more included in participants' selves revealed a smaller absolute difference between self-complexity and other complexity, thus demonstrating greater similarity in representational structure.

Discussion

These results provide additional evidence that the complexity with which people perceive themselves relates to the complexity with which they perceive others, but especially as those others are relatively more included in the self. Replicating Study 1, participants' self-complexity and complexity of their closest other were significantly related. And more generally, the correspondence between self-complexity and other complexity was greater for targets who were more included in the self (e.g., closest other and friend).

The lack of correspondence between self-complexity and perceived complexity of George Washington and of an acquaintance suggests that people are not biased to perceive everyone in the same way that they perceive themselves. It further indicates that the relation between self-complexity and close other complexity in Study 1 was not a consequence of a general tendency to approach the attribute sorting task in a certain way. If that were the case, self-complexity would have corresponded with perceived complexity of each target. Instead, these results could suggest that when a person becomes more included in one's mental representation of the self, the structure of one's self-representation (i.e., self-complexity) influences the mental representation of the other person.

Importantly, however, the perceived complexity of George Washington is a notable exception to the general finding that targets who were more included in the self were also seen as more similar to the self. Specifically, George Washington was less included in participants' selves than a friend, yet the absolute difference scores for these two targets were not significantly different. Importantly, despite this exception, the overall correlation between self-other difference and inclusion in self lends support to the argument that inclusion increases perceptions of structural similarity. A possible explanation for the exception is that participants know very little about George Washington relative to the other targets (who they know personally) and thus use their own self-concept to "fill in the blanks" of their knowledge about this target. Although we propose that people's self-concept structure influences how they perceive close others, perhaps it has a similar effect on representations of unfamiliar others. Indeed, there is evidence that people are more likely to use the self as a reference point more generally for understanding unfamiliar social targets than those they know well (Holyoak & Gordon, 1983; Markus & Wurf, 1987).

It is important to note that Studies 1 and 2 cannot causally establish that the correspondence between one's own self-complexity and the complexity with which they see a close other results from greater inclusion of the other in the self . For example, rather than inclusion of other in self being the primary determinant of self-other correspondence, it could be that inclusion results from structural similarity between the self and relevant others. In other words, it is possible that people only include others who they perceive as similar (in the organization of their self-aspects) in their sense of self. Thus in Study 3, we experimentally manipulated inclusion of other in self to observe its effect on the correspondence between self-complexity and other complexity.

Study 3

Overview

Participants completed a measure of complexity for a casual friend. We selected a casual friend as the target because such a person would likely be interpersonally closer than an acquaintance (who was relatively excluded from the self; see Study 2) but not as close as a close friend (who was relatively included in the self), thus making such a target ideal for manipulating inclusion in self. In the current study, we manipulated inclusion of other in self by having some participants take the perspective of this casual friend. Perspective-taking has been found to increase the overlap between the cognitive representation of another person and oneself by increasing the amount of traits seen as descriptive of both oneself and the other person (e.g., Davis et al., 1996; Galinsky & Moskowitz, 2000). For these reasons, we expected that perspective taking would increase IOS, and accordingly, increase the correspondence between participants' self-complexity and perceived complexity of this casual friend.

Participants

Thirty-nine Miami University undergraduates received course credit for their participation. Data from two participants were removed because they failed to follow instructions on the essay task (to be described).[3]

Measures and materials

Self-complexity and other complexity

Self-complexity and perceived complexity of a casual friend were measured as in Study 2. The instructions for the casual friend complexity measure were identical to those used for the friend complexity task (Study 2) except that participants were instructed to describe a particular casual friend (see details below).

[3] These participants wrote about a specific feature of their friend instead of a day in the life of their friend.

Inclusion of other in self

The measure of IOS (Aron et al., 1992) was the same as that used in Study 2. However, in order to manipulate IOS, some participants took the perspective of their casual friend (based on the perspective taking task of Galinsky & Moskowitz, 2000). All participants wrote a short essay for 5 min about a day in the life of the casual friend they chose. Participants in the perspective taking condition were further told to imagine a day in the life of this person, "as if you were that person, looking at the world through his or her eyes and walking through the world in his or her shoes."

Procedure

Consistent with the previous studies, Study 3 was conducted in two sessions. Session 2 was typically held a few days or weeks after Session 1, although 5 participants completed both sessions on the same day. All participants believed the two sessions were unrelated experiments, and analyses revealed that the amount of time between Sessions 1 and 2 had no effect on the measures. During Session 1, participants completed the measure of self-complexity. During Session 2, participants were seated at a computer and instructed to think of a person who was a casual friend. They were told that this person should be more than an acquaintance but should not be their best friend, and that they should consider this person to be a friend but not a close friend. After selecting a specific casual friend, participants were informed that they would be writing an essay about a day in the life of their casual friend. Participants in the perspective taking condition were further instructed to imagine they were the other person while writing the essay. Following the 5 min essay task, participants completed the IOS scale for their casual friend followed by the measure of perceived complexity for the friend.

Results

Manipulation check

We examined our *a priori* prediction that perspective taking would increase IOS and the correspondence between self-complexity and other complexity using one-tailed tests. A one-way ANOVA of condition (perspective taking vs. control) on IOS scores supported this prediction, $F(1,33) = 2.66$, $p = .05$, revealing that participants in the perspective taking condition included the casual friend in their self ($M = 3.24$, $SD = 1.20$) more than did participants in the control condition ($M = 2.67$, $SD = .84$).[4]

Correspondence between self-complexity and other complexity

Consistent with our predictions, a one-way ANOVA revealed that the effect of perspective taking condition on the absolute difference between self-complexity and other complexity was significant, $F(1,32) = 4.20$, $p < .05$.[5] Specifically, the absolute difference between self-complexity and perceived complexity of the casual friend was smaller in the perspective taking condition ($M = .58$, $SD = .33$) than in the control condition ($M = .96$, $SD = .66$).

Discussion

In Study 3, the experimental manipulation of inclusion of other in self through perspective taking affected the correspondence between self-complexity and other complexity. Participants who took the perspective of a casual friend were more likely to include that friend in their sense of self, and they showed greater correspondence between their own self-complexity and the complexity of that friend. This suggests that the relations between self-complexity and close other complexity in Studies 1 and 2 could not be solely attributed to participants including only people with similar self-complexity in their self-concept. In other words, it seems reasonable that including others in the self leads to using the organization of one's self-concept as a template for the mental representation of that other person.

General discussion

Researchers have known for some time that features of the self influence how others are perceived and evaluated. For example, people assume others are like themselves (e.g., Marks & Miller, 1987), emphasize their own strengths and attributes when evaluating others (e.g., Sedikides & Skowronski, 1993), and use their own performance as a comparison standard when evaluating the performance of others (see Dunning, 2003). Moreover, features of the self (e.g., a relational self-concept; Cross, Bacon, & Morris, 2000) often guide interpersonal behavior and affect the quality of close relationships. Research has also shown that including another person in the self leads people to see that person as possessing traits that are self-descriptive (e.g., Davis et al., 1996). However, the current studies are the first to show that including another in the self is also associated with a convergence between the structures of one's self-concept and the mental representation of that close other. As seen in Study 1, this outcome was not the result of a general proclivity to view the world in a systematically complex fashion (i.e., cognitive complexity). Instead, self-concept structure was only related to the structure of others included in the self (Study 2). The causal direction of this relation, as shown by manipulating inclusion of other in self (Study 3), indicates that self-concept structure is projected onto others as a result of their inclusion in the self.

Thus, the current findings meaningfully extend past work investigating the extent to which the self impacts perceptions of others by demonstrating structural overlap in the mental representations of the self and close others. Although much past research has found that self-relevant characteristics color how other people are viewed and evaluated, the current data demonstrate that the organization of one's self-concept appears to exert a similar influence. We suggest that the self serves as a "template" for perceiving included others such that the organization of the self-concept is projected onto the representation of meaningful individuals.

Although the results of Study 3 are consistent with this causal assertion, future work should assess changes in self- and other complexity correspondence over time to further confirm that this correspondence increases with greater relationship closeness (i.e., inclusion of other in self). Inclusion of another in one's self occurs slowly as a relationship progresses, making it difficult to manipulate experimentally. For this reason, while the perspective taking manipulation in Study 3 was successful in increasing inclusion in the self, it nevertheless produced only a modest increase in inclusion in self that could not be tested for mediation. Interestingly, the finding that Study 3 successfully manipulated inclusion and related outcomes raises the possibility that a long-term relationship is not necessary for projecting one's self-complexity. The structural similarity perceived between self and close others may be caused by both an immediate perceptual bias and a gradual alignment of representational structures.

Alternatively, inclusion in self (and subsequent self-concept structure projection) may be just one of many factors responsible

[4] Degrees of freedom were different due to a computer error resulting in missing IOS data for two participants.

[5] Self-complexity data were missing from three participants due to experimenter errors at Session 1 that were unknown at the time participants returned for Session 2.

for the effect. For example, it may be that people are initially attracted to those who they perceive as structurally similar, and this perception is further augmented when certain people become included in the self. In addition, there may be some accuracy to the perception of structural similarity. That is, just as relationship partners' physical appearance (Zajonc, Adelmann, Murphy, & Niedenthal, 1987) and attitudes (Davis & Rusbult, 2001) converge over time, so too might their self-concept structures come to resemble each other. This is an intriguing possibility awaiting further research.

Implications for the self and relationships

We contend that there are a number of important implications for perceiving meaningful others as structurally similar to the self. For example, individual differences in self-concept representation predict a variety of responses, including affect intensity and mood fluctuations (Linville, 1985), how positive life circumstances produce greater well-being (McConnell, Strain, Brown, & Rydell, in press), the expression of chronic attributes (Brown & McConnell, 2009), changed evaluations of numerous self-relevant domains (McConnell, Rydell, & Brown, 2009), and effective mental regulation (Renaud & McConnell, 2002). Therefore, to the extent that people anticipate their close others will respond in ways similar to themselves, it seems likely they would feel greater confidence when predicting the reactions and behaviors of meaningful others in their lives.

It is also possible that structural similarity will have additional consequences for close relationships. Recently, researchers have examined how relationship quality is influenced by individuals' cognitive representations of relationships and of their romantic partner (e.g., Kim, 2006; Showers & Kevlyn, 1999). For example, Kim (2006) found that self-complexity is related to the complexity with which one perceives relationships. Relationship complexity (which is measured by sorting attributes of romantic relationships) also predicts affective reactions to unpleasant events concerning a romantic partner, demonstrating that how people perceive relationships influences the quality of their own partnerships. In addition to representations of one's partner and one's relationship influencing relationship quality, these factors may affect each other in the opposite direction. Specifically, relationship satisfaction might increase the perceived overlap between self and other. For instance, our results indicate that including others in the self leads to greater structural overlap between self and other. Interestingly, the IOS measure was designed to assess to relationship closeness and satisfaction, with greater self-other overlap indicating greater satisfaction (Aron et al., 1992). Thus, a highly satisfying relationship should increase inclusion of other in self, resulting in an enhanced perception of structural similarity between the self and other.

Moreover, as people believe they share structural similarity with meaningful others (as well as content similarity), they should feel more similar to, and thus more connected with, meaningful others and find such apparently similar others to be more attractive as well (e.g., Berscheid, Dion, Walster, & Walster, 1971). For example, people with lower self-complexity who have few and overlapping areas of their life may be pleased by the thought that their partners also possess only a few meaningful domains and see the possibility for heightened social comparison reduced.

Further, just as self-complexity can influence affective reactions to events relevant to an important relationship, it may also influence affective reactions to the fortunes of relationship partners and other meaningful people. For example, perceiving close others as structurally similar may result in strong empathetic reactions to the success or failure of close associates. If the nature of one's self-concept makes "mood swings" or "impulse control" more or less likely, those who can appreciate and understand such experiences may be especially empathetic and effective friends and lovers. On the other hand, expecting a partner to have similar affective reactions may backfire if the perception of structural similarity is inaccurate. For example, a person with greater self-complexity who expects her partner to have muted emotions may be unsympathetic when a lower self-complexity partner "overreacts" to an event.

Finally, it would be interesting to compare perceived complexity of a meaningful other with the actual self-reported complexity of that same person. For instance, the extent to which people accurately perceive similar self-concept structures might predict their satisfaction with or the success of the relationship because the affective and mood responses of both partners will correspond. Moreover, people may feel closer to their partners if those partners have an accurate perception of their self-complexity. Indeed, just as self-verification theory posits that people whose view of their partner corresponds to the partner's own self-perceptions fare better in a number of social outcomes (such as roommate satisfaction and marital commitment; e.g., Swann, Wenzlaff, Krull, & Pelham, 1992), so too might "structural self-verification" convey similar advantages. Future research should tackle these questions.

Conclusion

The current work, across three studies, indicates that including others in the self-concept results in structural overlap in the mental representations of the self and other. This represents a novel demonstration of structural, rather than content, overlap for meaningful others. These studies extend our knowledge of how the self affects social perception by demonstrating that its structure can influence mental representations of meaningful others. This could have a number of implications for relationships with close others, including feelings of empathy, perceived connectedness, and relationship quality. In sum, the current results indicate that when we include others in the self, we truly see them as we see ourselves.

Acknowledgments

This research was supported by NSF Grant BCS 0601148 and by the Lewis Endowed Professorship.

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