The Social Relations Model: How to Understand Dyadic Processes

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Abstract

The social relations model (SRM) is an intriguing tool both to conceptualize and to analyze dyadic processes. We begin with explaining why interpersonal phenomena in everyday life are more complex than often considered. We then show how the SRM accounts for these complexities by decomposing interpersonal perceptions and behaviors into three independent components and describe the designs required to investigate these components. We then provide a step-by-step introduction into social relations analyses, thereby showing how the SRM can be used to investigate a multitude of exciting research questions. Finally, we summarize the existing software solutions for conducting social relations analyses. Resources for further information are suggested.

''I think everybody should like everybody.''

(Andy Warhol, 1963)

This quote by the famous pop artist Andy Warhol ironically describes a naive view of interpersonal phenomena. For better or for worse, this is obviously not the case in everyday life. We perceive others differently and behave differently depending on who is our social partner. Moreover, others perceive the same social partners differently and react differently toward them than we do. In sum, the ironic naive wish of Andy Warhol stands in sharp contrast to the actual complexity of interpersonal perceptions and behaviors.

The social relations model (SRM; Kenny & La Voie, 1984; Kenny, 1994) is one way to model the complexity of social phenomena between two people such as attraction, aggression, helping, persuasion, friendship, and cooperation which make up most of our everyday interactions (Bakeman & Beck, 1974; James, 1953). We first review briefly some of the previous applications of SRM. The SRM has been used to study small-groups phenomena, such as status (Anderson & Kilduff, 2009), leadership (Kenny & Livi, 2009), and intergroup relations (Boldry & Kashy, 1999). Among the naturalistic groups that have been studied are juries (Marcus, Lyons, & Guyton, 2000), therapy groups (Mahaffey & Marcus, 2006), and sports teams (Vargas, 1986).

Interpersonal attraction has been a major SRM topic, including studies on first impressions (Back, Schmukle, & Egloff, forthcoming), the development of friendship (Back, Schmukle, & Egloff, 2008), speed dating (Asendorpf, Penke, & Back, forthcoming; Eastwick, Finkel, Mochon, & Ariely, 2007), and self-disclosure (Miller & Kenny, 1986). Various different types of dyadic relationships have been studied, such as negotiators (Elfenbein, Curhan, Eisenkraft, Shirako, & Baccaro, 2008), family members (Cook, 2000), prison inmates (Marcus, Hamlin, & Lyons, 2001), and teacher–student dyads (Horn, Collier, Oxford, Bond, & Dansereau, 1998). The units studied do not even need

to be human, as dogs (Gosling, Kwan, & John, 2003), mice (Malloy, Barcelos, Arruda, DeRosa, & Fonseca, 2005), and countries (Hoff, 2005) have also been studied.

By far, the major use of the SRM has been to study consensus (Albright, Kenny, & Malloy, 1988; Kenny, Albright, Malloy, & Kashy, 1994) and accuracy (Kenny, Kieffer, Smith, Ceplenski, & Kulo, 1996; Kenny et al., 2007) of personality impressions. Finally, there has been an interest in meta-accuracy (i.e., whether people know how others see them; Kenny & DePaulo, 1993; Levesque, 1997) and self-enhancement (Anderson, Ames, & Gosling, 2008; Anderson, Srivastava, Beer, Spataro, & Chatman, 2006; Kwan, John, Robins, & Kuang, 2008).

The use of the SRM is growing, nearly doubling every 7 years: 24 published articles before 1994, 59 from 1994 to 2001, and 110 from 2002 to 2009 (see http://davidakenny. net/doc/srmbiblio.pdf for a bibliography of published articles using the SRM). Nonetheless, most psychologists still consider the SRM (1) as merely being a statistical technique that is (2) required for only very specific kinds of interpersonal perception data and (3) very complicated. We argue here for a more widespread use of the SRM. Although the implementation of the SRM requires specific research designs and some statistical sophistication, the SRM itself is (1) a conceptual framework that (2) applies to all dyadic phenomena and (3) can easily be understood. Most importantly, we think that the SRM is a particularly useful way to capture the complexities of interpersonal phenomena in everyday life and allows for a fresh look on a variety of exciting classic and new research questions.

In the present overview, we provide a comprehensible conceptual (not statistical) introduction into the SRM. Not a single formula or equation is presented, but we shall provide relevant references concerning the statistical details (see Software and Recommended Resources). We begin by describing the complexities implied in everyday interpersonal phenomena. We then present the essential conceptual ideas of the SRM that account for these complexities. Afterward, we present designs that can be used to gather appropriate data. We then provide a step-by-step introduction into univariate, bivariate, and more complex social relations analyses. Finally, we summarize the existing software solutions for conducting analyses using the SRM.

A Complex Research Field: Perceiving and Acting in Everyday Situations

A major goal of psychology is to understand how people act, feel and think in everyday situations. The study of human behavior in everyday contexts has also long been a focus in developmental (Bronfenbrenner, 1979), comparative (Miller, 1977), decision making (Todd & Gigerenzer, 2000), and even experimental psychology (Gibson, 1979). However, within social and personality psychology, the study of such actual phenomena has long been neglected. Fortunately, this suboptimal situation has changed and a growing number of social psychologists and personality researchers call for a stronger focus on actual social phenomena (Back & Egloff, 2009; Back, Schmukle, & Egloff, 2009; Baumeister, Vohs, & Funder, 2007; Furr, 2009).

However, complexities arise when moving from examining isolated or self-reported behaviors (e.g., How much do you flirt?) and hypothetical perceptions (e.g., reading a written description of a fictitious flirter and rating the likeability of this person) to actual dyadic behaviors (e.g., flirting) and interpersonal perceptions (e.g., liking).

First, in most interesting everyday situations, human perceptions and behaviors are directed toward other people. Imagine, for example, a crowded club where a live band is playing downtown late at night; Alan and his friends Bernd and Chris are there, sitting at the bar and sipping their drinks. Debby and her roommates Evelyn and Frida arrive and

are now standing next to the men. In such situations, the men and the women perceive the *others* in the bar, and they feel and think about these *others*. For example, Alan might like Debby, and he might also think Debby is very intelligent. Most human actions are also directed toward *others*. For example, Alan might smile a lot at Debby. He might also – later that evening – ask her for a date.

Second, perceptions and behaviors in interpersonal situations are two-sided. People are not only *perceivers* but also at the same time *targets* being perceived by others. Debby might, for instance, also regard Alan as intelligent but might not be attracted to him. With regard to behavior, people are not only *actors* who behave toward others but they are also *partners* with whom others interact. Debby might, for example, smile back when Alan directly looks at her, but she might not make efforts to get physically closer to him.

Third, people are aware of the fact that others perceive them and that others have the potential to act toward them. As a consequence, they often engage in mind reading and have *metaperceptions* about how others might see them. For example, Alan might be unsure about the impression that he has made on Debby. He might wonder, 'Is she interested in me?' Debby in turn might realize that Alan is interested in her.

Fourth, perceptions and behaviors in everyday situations are often closely related to self-perceptions. The self-concept influences the way people behave and perceive others, and the way people metaperceive influences their self-concept. Alan might, for example, dare to flirt with Debby because he regards himself as an intelligent person; he might also imagine Debby as similar to him (intelligent) because he is attracted to her. Debby might be reinforced in seeing herself as physically attractive because she metaperceives Alan's interest in her.

Finally, people can perceive and behave differently depending on the target whom they perceive and the partner with whom they interact. Alan might, for example, regard Debby but not Evelyn as intelligent. Debby might smile at Alan but not smile at Bernd.

To sum up, in everyday social situations, interpersonal perceptions and behaviors are directed toward others, they are two-sided, include meta- and self-perceptions, and vary depending on the social partner with whom one perceives or interacts. In the following, we outline the basic concepts of the social relations model – a general conceptual and statistical framework that accounts for these complexities.

The Basic Concepts: Three Components Everywhere

Dyadic measurements, by definition, involve two people: Debby thinks Allan is cute, Evelyn flirts with Bernd, and Chris likes Bernd. The SRM denotes the two people of a dyadic measurement as *actor* and *partner*. The actor provides the measurement, and the partner is the other person. The terms *actor* and *partner* are generic terms, and other terms can and should be used in different contexts. For instance, for interpersonal perception, the terms *perceiver* and *target* are typically used, and we use them here. In nonverbal communication, the terms *receiver* and *sender* might be used, whereas in aggression research the terms *bully* and *victim* might be appropriate.

The SRM is based on the idea that dyadic interpersonal phenomena are necessarily componential (Kenny, Kashy, & Cook, 2006; Kenny, West, Malloy, & Albright, 2006). Consider one person's perception of another person. That perception consists of three major components: a general tendency of the perceiver (*perceiver effect*), a general tendency of the target (*target effect*), and a specifically relational perception that is independent of these two main effects (*relationship effect*). For example, consider Alan's perception of Debby as very intelligent. This perception might be attributed to Alan's high perceiver

effect (he sees most people as very intelligent), Debby's high target effect (she is seen as very intelligent by many others), or to an especially high relationship effect that Alan has toward Debby (he regards her as very intelligent, more than he regards others as intelligent and more than others regard her as intelligent). A mixture of all three effects finally makes up Alan's resulting perception of Debby's intelligence. Alan's liking of Debby can be decomposed in the same way. It is because of Alan generally liking most people, Debby generally being liked by most people, and Alan uniquely liking Debby.

The same logic applies to behaviors. Each behavior consists of a general tendency of the actor (*actor effect*), a general tendency of the partner (*partner effect*), and a specifically relational action that is independent of these two main effects (*relationship effect*). Alan's smiling at Debby can be explained by his actor effect (he generally smiles a lot), Debby's partner effect (people generally smile a lot at Debby), or a specific relationship effect of Alan toward Debby (he especially smiles at her, more than he smiles at others and more than others smile at her). What about Debby not choosing Alan? Perhaps she is a very choosy person (low actor effect). Alternatively, Alan could have a low mate value, generally not being chosen a lot (low partner effect). Or, perhaps there is a poor chemistry between her and Alan (low relationship effect): She specifically does not choose him, although she chooses others and although Alan is chosen by others.

In an analogous way, any dyadic measurement can be decomposed into components: Try to describe the social perceptions and behaviors you perform and encounter in terms of perceiver or actor, target or partner, and relationship effects – once you get used to this idea you will see components everywhere! In Table 1, SRM components along with possible psychological labels are shown for different interpersonal perceptions and behaviors.

What follows is all based on these components. The SRM is about variances and correlations of components: How much do people differ with respect to actor, partner, and relationship effects? How strongly are these effects interrelated? How strongly are they related to other variables? Before we explain each step in more detail, we briefly describe what kind of design is required to study these components.

Design Considerations

To disentangle the three major SRM components, it is necessary to account for the two-sided nature of dyadic interaction. For perceptions, each perceiver must judge multiple

Table 1 Examples of components of interpersonal perceptions and behaviors

Interpersonal perception

Judgment	Perceiver effect	Target effect	Relationship effect
Personality judgment	Judgmental bias	Reputation	Unique impression
Liking	Leniency	Popularity	Unique liking
Metaperception	Chronic expectation	Judgmental reputation	Unique expectation

Interpersonal behavior

Example	Actor effect	Partner effect	Relationship effect
Choice	Choosiness	Interpersonal value	Unique preference
Behavior	Habit	Evoked affordance	Unique adaptation

Table 2   Designs used for social relations model

Round-Robin design						Block design					
Partner						**Partner**					
Actor	A	B	C	D	E	F	Actor	A	B	C	D	E	F
A	-	x	x	x	x	x	A	-	-	-	x	x	x
B	x	-	x	x	x	x	B	-	-	-	x	x	x
C	x	x	-	x	x	x	C	-	-	-	x	x	x
D	x	x	x	-	x	x	D	x	x	x	-	-	-
E	x	x	x	x	-	x	E	x	x	x	-	-	-
F	x	x	x	x	x	-	F	x	x	x	-	-	-

Note. Each 'x' is an interpersonal perception rating and a behavioral observation. Note that '-' indicates uncollected data or data set aside for subsequent analyses.

targets and each target must be judged by multiple perceivers. For example, if a researcher wanted to understand why Debby sees Alan as intelligent, the researcher must know not only how intelligent Debby finds Alan but also how intelligent she finds Bernd, Chris, Evelyn, and Frida (i.e., Debby's perceiver effect) as well as how Bernd, Chris, Evelyn, and Frida evaluate Alan's intelligence (i.e., Alan's target effect). Moreover, to understand why Alan flirts with Debby, we need to know not only how much Alan flirts with Debby but also how much he flirts with Evelyn and Frida (i.e., Alan's actor effect) as well as how much Bernd and Chris flirt with Debby (i.e., Debby's partner effect).

The two most commonly used SRM designs are the round–robin design and the block design, which are illustrated in Table 2. In both cases, there are six people labeled as A, B, C, D, E, and F (e.g., Alan, Bernd, Chris, Debby, Evelyn, and Frida). For the round–robin design, each of these six persons rates or interacts with each of the other five persons. For example, one might be interested in intelligence judgments and ask each of the six persons to rate the intelligence of each other person. In the same way, one could obtain behavioral round–robin data (e.g., observe the number or intensity of smiles of each person toward each other person).

The block design, on the right side of Table 2, is preferable when one wants to analyze only asymmetric dyads, e.g. men and women in a speed-dating study. For example, if smiling among heterosexuals was of interest, one would care only about the cross-sex smiles (smiling of Alan, Bernd, and Chris toward Debby, Evelyn, and Frida and smiling of Debby, Evelyn, and Frida toward Alan, Bernd, and Chris) and not in smiling behavior of men toward men and women toward women. Thus, in a block design, a group of people is broken into two subgroups (e.g., men and women), and each person then rates or behaves toward everyone else in the other subgroup. Both designs, the round-robin design and the block design, are perfectly suited to investigate interpersonal phenomena in everyday life by performing social relations analyses (see Kenny, Kashy et al., 2006, for a variety of other dyadic designs).

Getting Started: Univariate Analyses

The first step of each social relations analysis involves univariate analyses. For each variable of interest, one examines the portions of variance that are due to the

perceiver/actor, target/partner, and relationship components (variance decomposition) as well as the inter-relations of components within each variable (reciprocities).

Variance decomposition

As described earlier, three components make up each interpersonal perception and behavior. Consequently, according to the SRM, the total variance in a given perception or behavior can be decomposed into three different sources of variance: *perceiver variance* or *actor variance* (e.g., How much do people differ in how they generally see others and in how they generally behave toward others?), *target variance* or *partner variance* (e.g., How much do people differ in how others generally perceive them and in how others behave toward them?), and *relationship variance* (e.g., How much do people differ with respect to their unique perceptions and actions toward specific other persons?). Additionally, dyadic perceptions or behaviors may include *error variance* (variation in perceptions or behaviors because of chance).

To obtain results for these variances, a perceiver or actor and a target or partner effect estimate is computed for each individual, and two relationship effect estimates are computed for each dyad. With these estimates, special SRM formulas are used to compute the variances. To separate the relationship effect from error (and thus relationship variance from error variance), at least two observations of the dyadic perception or action are necessary. For example, Alan's smile intensity toward Debby might be observed several times or observations of more than one rater might be used. In contrast, if we have only one observation, relationship variance is necessarily confounded with error variance.

Results of variance decomposition typically include the variance, as well as the proportion of the total variance for each component. Additionally, tests of statistical significance are performed for perceiver, target, and relationship variances. Readers are recommended to refer to Kenny, Kashy et al. (2006; Chapter 8) and Kenny (1994; Appendix B) for more information concerning the computational details of the SRM.

What do these variance estimates tell us? Variance decomposition can be seen as the first basic descriptive statistic of social relations analyses. Before looking at the more complex aspects of Alan's and Betty's (and their friends') perceptions and behaviors, one needs to know how important perceiver or actor, target or partner, and relationship components are for each single variable. The amount of perceiver variance of interpersonal perceptions shows the use of different standards of perceivers in generally evaluating others. It is also called *assimilation* because it indicates the extent to which perceivers assimilate targets differently. If Alan likes Bernd, Chris, Debby, Evelyn, and Frida very much, Chris likes them all only a little, but Frida does not like any of them at all, there would be a high degree of assimilation in liking judgments. If all of them had a similar mean impression of the others' intelligence, assimilation of intelligence judgments would be low. Analogously, actor variance of behavioral observations reflects general individual differences in how people behave across interaction partners and can thus be labeled as *behavioral consistency*. If Alan smiles a great deal at all three women, Bernd generally does not smile at all, and Chris generally shows a medium amount of smiling across interaction partners, behavioral consistency of smiling would be high.

The amount of target variance of interpersonal perceptions indicates how much people differ in how they are seen by all others. The more perceivers agree in who is high, medium, or low with respect to a certain characteristic, the higher the amount of target variance there would be. Therefore, target variance is a measure of *consensus* of interpersonal perception. If Bernd, Chris, Debby, Evelyn, and Frida agree that Alan is very intelligent;

Evelyn is seen as being medium intelligent by all others; and all agree that Chris is not a very smart person, consensus in intelligence ratings would be high and there would be strong reputational differences (Alan genius, Evelyn average, Chris not so smart). If Alan is liked differently depending on whether he is judged by Bernd, Chris, Debby, Evelyn, or Frida and the others are also judged very differently, consensus of liking would be low and there would be few popularity differences. The level of behavioral partner variance indicates how much people consistently evoke different behaviors from interaction partners and, thus, induce behavioral affordances. If Debby is chosen as a potential date by Alan, Bernd, and Chris; Frida is chosen only by Bernd; and Evelyn is not chosen at all, there would be a high amount of partner variance and strong differences in the woman's dating value. If Alan, Bernd, and Chris all receive a similar mean amount of smiling from the women, partner variance in observed smiling intensities should be low.

Finally, the amount of relationship variance describes how much people differ in how they idiosyncratically judge and behave toward specific interaction partners. It is also called *uniqueness* – the more people consistently show perceptions and actions that are not explainable by individual perceiver or actor and target or partner effects, the higher the uniqueness is. In our example, uniqueness of liking would be higher, the more Chris likes Evelyn although he generally dislikes others and others generally dislike Evelyn, Alan dislikes Frida although Alan generally likes others and others generally like Frida, and so forth. Uniqueness of smiling behavior would, for example, be low, in case that Alan's smiling toward Debby is well explainable by Alan generally being a smiler and Debby often being smiled at, and Bernd's grumpy expression toward Frida is a function of his general unfriendly expression and Frida's tendency to evoke unfriendly behavior.

Results of variance decomposition provide an interesting first glimpse into the meaning of interpersonal perception or behavioral data. They are also important prerequisites for subsequent analyses: Univariate correlations (reciprocities), bivariate correlations, and correlations with external variables should be analyzed for only those components that account for a non-trivial amount of variance. If Alan, Debby, and their friends do not differ in liking others generally (there is no perceiver variance in liking judgments), it makes no sense to ask whether likers are liked more or whether agreeableness leads to liking others. Similarly, if Alan, Bernd, and Chris do not differ in how much the women smile at them (there is no partner variance in smiling), one does not need to ask whether attractive people are more smiled at or whether receiving smiles is a predictor of subsequently being chosen as a dating partner.

Table 3 Examples of variance partitioning for four types of variables (Proportions of total variance)

	Trait rating	Liking	Meta-perception	Behavior
Actor[a]	0.20	0.17	0.55	0.31
Partner[b]	0.15	0.13	0.04	0.02
Relationship[c]	0.20	0.38	0.10	0.67[e]
Error[d]	0.45	0.32	0.30	–

[a]Kenny (1994), page 86.
[b]Kenny (1994), pages 203-204.
[c]Kenny (1994), page 153.
[d]Kenny et al. (2001), page 135.
[e]Error and relationship confounded.
Table adapted with permission from Kenny et al. (2006a,b), Table 8.6.

As can be seen in Table 3, results of variance partitioning can be quite different for different types of variables. Typically, trait ratings are to a comparable amount attributable to the perceivers' judgmental biases (perceiver variance), the targets' reputations (target variance), and unique personality impressions (relationship variance) (Kenny, 1994). Liking is a fundamentally dyadic phenomenon (large amounts of relationship variance), and metaperceptions are highly influenced by generalized expectations of perceivers (large amounts of perceiver variance) (Kenny, 1994). Interpersonal behaviors seem to be relatively consistent (large amounts of actor variance), and there are very few differences of interaction partner to evoke different reactions by others (almost no partner variance) (Kenny, Mohr, & Levesque, 2001). Different types of dyadic variables have different SRM signatures much in the same way that different elements have a different mass spectrometer signature.

Reciprocities

Within each variable, one is often interested in the *reciprocity* of interpersonal phenomena. Sometimes perceptions mirror each other, for example, Alan thinks Debby is intelligent and Debby also thinks Alan is intelligent. In other cases, however, interpersonal perceptions do not match: Debby does not like Alan as much as Alan likes Debby. Behavior can also be reciprocal (Alan smiles at Debby, Debby smiles at Alan) or complementary (Alan chooses to date Debby but Debby does not choose Alan).

Interestingly, within the SRM, there are two different types of reciprocity (Kenny & Nasby, 1980; Miller & Kenny, 1986). At the individual level, *generalized reciprocity* can be computed by correlating the perceiver and target effects or actor and partner effects. For interpersonal perceptions, this correlation indicates how much generally perceiving others in a certain way is correlated with being perceived in the same way. If Alan, for example, likes Bernd, Chris, Debby, Evelyn, and Frida and is also liked a lot by them, whereas Frida who generally dislikes others is rather disliked by them, there would be a positive generalized reciprocity of liking judgments (likers are liked). For behaviors, generalized reciprocity tells us how much generally acting toward others in a certain way is correlated with others acting in the same way toward oneself. If Debby, Evelyn, and Frida smile a great deal at Alan the smiler but less at Bernd, who generally does not smile, there would be a positive generalized reciprocity of smiling behavior. Generalized reciprocity can also be negative. For example, in the context of dating, it might be that choosy people (low actor effect for choice) are chosen more (high partner effect for choice), whereas needy people who choose a lot (high actor effect for choice) are seldom chosen (low partner effect for choice) (e.g., Asendorpf et al., forthcoming; Eastwick et al., 2007). In fact, generalized reciprocities are often zero or even negative (Kenny, 1994).

Dyadic reciprocity can be computed by correlating relationship effects within dyads. For interpersonal perceptions, dyadic reciprocity shows how much seeing a specific other person in a particular way is related to being seen in the same way by this person. If Chris particularly dislikes Debby and particularly likes Frida (over and above his general tendency to dislike others and the woman's degree of popularity), does Debby particularly dislike and Frida particularly like him? Whereas the evidence seems to be that there is little or no dyadic reciprocity for trait judgments, dyadic reciprocities of liking judgments are typically positive and increase when people get to know each other (Back, Schmukle, & Egloff, 2010a; Kenny, 1994).

In the case of interpersonal behavior, dyadic reciprocity indicates how much one person's unique behavior toward another person is related to that person's unique behav-

ior toward the first person. A strong positive dyadic reciprocity correlation for smiling would, for example, be found if Alan's relationship effect toward Debby (he smiles even more than he usually does and others usually smile at Debby) is correlated with Debby's relationship effect toward Alan (he receives more than the usual amount of smiling that he usually gets and that she usually shows). Dyadic reciprocities of many behaviors are quite high (Kenny et al., 2001).

Digging Deeper: Bivariate Social Relations Analyses

So far, we have concentrated on one variable at a time. Most research questions require the inclusion of more than one variable. For example, one might be interested in how smiling behavior affects mating choice. Typically, participants would be shown videotapes in which several (more or less smiling) potential dates are shown. For each hypothetical date, one would then ask the participants for her or his mating choice. Finally, one could correlate smiling intensities and mate choices, resulting in one indicator of the effect of smiling on mating choices.

One could, however, also observe smiling behavior and collect mate choices in a more realistic setting, for example, by setting up a block design within the club Alan, Debby, and their friends hang out. We could observe the smiling behavior and collect mate choices of Alan, Bernd, and Chris toward Debby, Evelyn, and Frida and *vice versa*. Interestingly, using such an everyday approach, bivariate social relations analyses do not give *one* answer to the question how smiling affects mate choices but *six*!

On the *individual level*, there are four possible correlations between actor and partner effects of both variables. The *actor–actor correlation* would indicate how much smiling at others generally is related to choosing others more frequently (e.g., Is Alan the smiler rather unconstrained concerning his mate choices?). The *actor–partner correlation* tells us how much generally smiling at others is related to being chosen more frequently (e.g., Has Alan the smiler a higher mate value?). The *partner–actor correlation* is a measure of the degree generally being smiled at correlates with the frequency of choosing others (e.g., Does Debby choose more mate partners because others smile at her more often?). And the *partner–partner correlation* indicates how much generally being smiled at is related to being chosen more frequently (e.g., Has Debby, whom others smile at often, a higher mate value?).

On the *dyadic level*, there are two types of correlations between relationship components. The *intraindividual relationship correlation* is between how much uniquely smiling at a particular person is related to uniquely choosing this person (e.g., Is Alan who smiles more at Debby than he usually smiles and more than Debby is usually smiled at more likely to choose her as a potential mate?). The *interindividual relationship correlation* indicates how much uniquely smiling at a specific person is related to uniquely being chosen by the same person (e.g., Is Betty particularly likely to choose Alan, who uniquely smiles at her?).

The preceding example combined two behavioral measures, smiling and mate choices, but any combination of perceptual and behavioral variables is possible. For example, when looking at the effect of smiling on impressions of intelligence, one would have an actor–perceiver correlation (Do smilers generally perceive others as intelligent?), an actor–target correlation (Are smilers generally perceived as intelligent?), a partner–perceiver correlation (Do people whom others smile at a lot generally perceive others as intelligent?), a partner–target correlation (Are people whom others smile at a lot generally perceived as intelligent?), an intraindividual relationship correla-

tion (Do people uniquely perceive specific others as more intelligent, whom they particularly smile at?), and an interindividual relationship correlation (Are people who uniquely smile at a particular person, uniquely perceived as intelligent by this person?). The SRM provides a dizzying array of possible correlations that can give rise to novel and interesting results.

Numerous other research questions can be analyzed by combining two perceptual and behavioral variables. Table 4 outlines just a few possibly interesting bivariate social relations analyses. Many of these analyses pertain to classical topics of personality and social psychology. Within the SRM, these topics can be investigated in a more differentiated way. There is, for example, not a single accuracy but there at least are three accuracies: perceiver accuracy, generalized accuracy, and dyadic accuracy (Kenny & Albright, 1987). The stability and trans-situational consistency of perceptions or behaviors can also be measured in three different ways (Malloy, Albright, Kenny, Agatstein, & Winquist, 1997; Malloy et al., 2005), and the same applies to topics like meta–accuracy (mind–reading accuracy, empathic accuracy) or assumed reciprocity (Back et al., 2010a; Kenny, 1994; Kenny & DePaulo, 1993) (see Table 4 for details).

Broadening the Scope: Including Personality and Situational Variables

All prior considerations were about variances and correlations of interpersonal perception or behavior components. Social relations analyses can additionally include other external variables like self-perceptions and personality variables as well as situational factors that are not subject to the same variance decomposition. To return to Alan, Debby, and their friends, one might, for example, be interested in the effect of self–perceived intelligence, extraversion, or openness on their dyadic perceptions and behaviors.

Such analyses are conducted by computing perceiver, target, and relationship effects and relate them to self and personality variables. The correlation between self-perceptions and the perceiver effect of the interpersonal perception regarding the same rating dimension (e.g., intelligence) can be described as *assumed similarity* (e.g., Kenny & Kashy, 1994; Mahaffey & Marcus, 2006): Perhaps Alan sees himself as very intelligent and by assuming similarity expects others to be intelligent as well. *Self-other agreement* can be computed by correlating the self-rating with the corresponding target effect (e.g., Anderson et al., 2006): Alan's self-perception as intelligent might converge with Bernd's, Chris's, Debby's, Evelyn's, and Frida's impression of Alan's intelligence.

Personality measures can be related to all different kinds of perceptual and behavioral components (e.g., Back, Schmukle, & Egloff, 2010b; Back, Krause et al., 2009a; Christensen & Kashy, 1998). One might, for example, correlate Bernd's, Debby's, and their friends' extraversion scores with perceiver effect for liking (Are extraverts likers?), target effect for liking (Are extraverts liked more?), actor effect for smiling (Do extraverts smile more?), and partner effect for smiling (Do others smile more at extraverts?). Moreover, specific relations between characteristics of individuals might predict relationship effects of interpersonal perceptions or behaviors. Perhaps Chris' specific liking of Evelyn can be explained by their similar levels of openness and their unique preference for diverse and intellectual conversational topics.

Finally, situational factors might also be included (e.g., Back et al., 2008). One could, for example, examine the effect of alcohol consumption on all individual and dyadic components. Does Bernd, who now has had a couple of vodkas, feel more attracted toward others (has a higher perceiver effect for liking) and smiles more (higher actor effect for smiling) than Chris who had only one light beer? And is Bernd now less likely

Table 4 Examples of potential bivariate social relations analyses

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Liking ↔ Metaperception Liking
How much Alan likes Debby ↔ How much Alan thinks Debby likes him or How much Debby thinks Alan likes him

Correlation	Research Question
Perceiver–Perceiver	Do likers expect to be liked? (Perceiver assumed reciprocity)
Perceiver–Target	Are likers seen as likers? (Perceiver meta-accuracy)
Target–Perceiver	Do people know how much they are liked? (Generalized meta-accuracy)
Target–Target	Are popular people seen as likers? (Generalized assumed reciprocity)
Relationship intrapersonal	Do people think they are particularly liked by those they particularly like? (Dyadic assumed reciprocity)
Relationship interpersonal	Do people know who particularly likes them? (Dyadic meta-accuracy)

Helpfulness Judgment ↔ Helpfulness Behavior
How helpful Alan sees Debby ↔ How helpful Debby is toward Alan or How helpful Alan is toward Debby

Correlation	Research Question
Perceiver–Actor	Do people who see others as helpful behave helpful? (Perceiver misattribution, Perceiver complementary projection)
Perceiver–Partner	Are people behaving helpful toward those who perceive others as helpful? (Perceiver accuracy; Perceiver self-fulfilling prophecy)
Target–Actor	Do people who are seen as helpful indeed behave helpful? (Generalized accuracy, Target self-fulfilling prophecy)
Target–Partner	Do others behave helpful toward those who are seen as helpful? (Target misattribution, Target complementary projection)
Relationship intrapersonal	Do people behave particularly helpful toward those they perceive as uniquely helpful? (Dyadic misattribution, Dyadic complementary projection)
Relationship interpersonal	Do people uniquely perceive those as helpful who particularly behave helpful toward them? (Dyadic accuracy, Dyadic self-fulfilling prophecy)

Intelligence Judgment Time 1 ↔ Intelligence Judgment Time 2
How Intelligent Allan sees Debby at time 1 ↔ How Intelligent Allan sees Debby at time 2 or How Intelligent Debby sees Allan at time 2

Correlation	Research Question
Perceiver–Perceiver	Stability of bias to see others as more or less intelligent (Perception bias stability)
Perceiver–Target	Effect of seeing others as intelligent on being seen as intelligent later (Trans-temporal impact of perception bias)
Target–Perceiver	Effect of being seen as intelligent on seeing others as intelligent later (Trans-temporal impact of reputation)
Target–Target	Stability of reputation as more or less intelligent (Reputational stability)
Relationship intrapersonal	Stability of unique impression of a person as particularly intelligent (Unique impression stability)
Relationship interpersonal	Effect of particularly seeing a person as intelligent on being seen as intelligent by that person (Trans-temporal impact of unique impressions)

Table 4   (Continued)

Smiling Behavior (Club) ↔ Smiling Behavior (Work)
How much Alan smiles at Debby at the club ↔ How much Alan smiles at Debby at work or How much
  Debby smiles at Allan at the work

Correlation	Research Question
Actor–Actor	Do people who smile more in a club, smile more at work? (Trans-situational consistency of behavior)
Actor–Partner	At work, do others smile more at people who smile a lot in clubs? (Trans-situational impact of behavior)
Partner–Actor	In a club, do others smile more at people who smile a lot at work? (Trans-situational impact of behavior)
Partner–Partner	Do others smile more at the same people, at work, and in a club? (Trans-situational consistency of evoked affordances)
Relationship intrapersonal	Is uniquely smiling at a specific person in a club related to uniquely smiling at this person at work? (Trans-situational consistency of unique behavior)
Relationship interpersonal	Is uniquely smiling at a specific person in a club related to this person uniquely smiling back at work? (Trans-situational impact of unique behavior)

to be chosen as a potential mate (target effect for choice)? Perhaps, Frida, who obtained similar levels of blood alcohol, is uniquely attracted toward him (relationship effect for liking)? Or one could examine whether the physical distance between individuals (a dyadic variable) is an indicator of later unique mate choice (relationship effect for choice): Can Alan's decision to choose Debby as a potential mate be detected when looking at the physical distance between Alan and Debby?

Software

We leave the club and return to our desktop to consider statistical analysis. Traditionally, the SRM has been estimated using specialized software programs. Kenny has developed two computer programs for performing social relations analyses, *SOREMO* (along with the windows-based program *WinSoReMo*) for round-robin designs and *BLOCKO* (plus *WinBLOCKO*) for block designs. Both programs allow for multiple analytic variants and give all necessary outputs of a social relations analysis in one run. The major limitation of BLOCKO is that it requires the same numbers of persons in all groups. Also both programs do not allow for any missing data. The programs, as well as detailed documentation, example data sets, and the computer program AID-SRM that can be used to determine the statistical power of one's SRM design (Lashley & Kenny, 1998) can be downloaded at http://davidakenny.net/srm/srmp.htm.

   Recently, Schmukle, Schönbrodt, and Back (2009) developed *Triple R*, a statistical package for univariate and bivariate social relations analyses for round-robin designs using the statistical software *R*. *Triple R* is neither restricted regarding the number of round-robin groups nor restricted regarding the number of participants per group. Moreover, within-group t-tests are included which are recommended if there is only one round-robin group (Kenny et al., 2006a,b; Lashley & Bond, 1997). The *Triple R* package including the program, example data, and documentation can be downloaded at http://

www.persoc.net/Toolbox/TripleR   or   at   http://cran.r-project.org/web/packages/TripleR/index.html. *Block R*, a statistical package for univariate and bivariate social relations analyses for block designs using the statistical software *R*, is currently being developed.

Work is underway to conduct social relations analyses with multilevel modeling (Kenny & Kashy, 2010) and structural equation modeling (Olsen & Kenny, 2006). Kenny and Livi (2009) describe how these analyses can be performed using conventional software. Also Kenny and Livi (2009) have developed a method within SAS that provides text which is available at http://davidakenny.net/dtt/srm.htm.

Conclusion

In this article, we presented the SRM as a general approach for social and personality psychology research on interpersonal perceptions and behaviors. We believe that the SRM can help to better understand many fascinating dyadic phenomena such as playing, fighting, feeling loved, cooperating, dating, knowing others, relationship satisfaction, self-disclosing, mind-reading, becoming friends, stereotypes, self-fulfilling prophecies, behaving expressive, being nervous, trusting, impression management, and self-knowledge, to name just a few! We invite researchers to become acquainted with this approach and apply the SRM for their own investigations. Although social relations analyses can sometimes be complicated, it is worth conducting them because they provide more detailed answers to important questions concerning how and why people think, feel, and behave in everyday life.

Recommended Resources

Basics

Kenny, D. A. (1994). *Interpersonal perception: A social relations analysis*. New York: Guilford.
Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*. New York: Guilford. (Chapters 8 and 9).
Kenny, D. A., West, T. V., Malloy, T. E., & Albright, L. (2006). Componential analysis of interpersonal perception data. *Personality and Social Psychology Review, 10*, 282–294.
http://davidakenny.net/kenny.htm (David A. Kenny's personal website; includes a great deal of information concerning the SRM).
http://www.persoc.net (a platform to promote research on the interplay of personality and social relationships applying a social relations approach; includes statistical, didactic, and conceptual tools).

Further Readings

Bond, C. F., Horn, E. M., & Kenny, D. A. (1997). A model for triadic relations. *Psychological Methods, 2*, 79–94.
Kenny, D. A., & Albright, L. (1987). Accuracy in interpersonal perception: A social relations analysis. *Psychological Bulletin, 102*, 390–402.
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Acknowledgment

Short Biographies

Mitja D. Back received his Ph.D. in Psychology in October 2007 from the University of Leipzig. Since April 2010, he is Junior Professor for Personality Psychology and Psychological Assessment at the Department of Psychology, Johannes Gutenberg University Mainz. He is interested in the determinants and accuracy of first impressions, the measurement and social consequences of personality, and the development of personality and social relationships. He is founder of the scientific network persoc.net, which applies a social relations approach to understand the interplay of personality and social relationships.

David A. Kenny received his Ph.D. in social psychology in 1972 from Northwestern University where he studied with Donald T. Campbell. He is currently Board of Trustees and Alumni Distinguished Professor at the University of Connecticut and he has also taught at Harvard, Christchurch, and Arizona State University. He served as first quantitative Associate Editor of *Psychological Bulletin*. He was awarded the Donald Campbell award from the Society of Personality and Social Psychology. He is the author of six books and has written extensively in the areas of mediational analysis, interpersonal perception, and the analysis of social interaction data.

Endnote

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