The perception of status: How we infer the status of others from their social relationships

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Abstract
This paper investigates how we infer the status of others from their social relationships. In a series of experimental studies, we test the effects of a social relationship's type and direction on the status judgments of others. We demonstrate empirically, possibly for the first time, a widely-assumed connection between network structure and perceptions of status; that is, that observers do infer the status positions of group members from their relationships. Moreover, we find that observers’ status judgments vary with the direction and type of social relationship. We theorize that underlying this variance in status judgments are two relational schemas which differentially influence the processing of the observed social ties. Our finding that only the linear-ordering schema leads to status inferences provides an important scope condition to prior research on network cognition, and specifically on the perceptions of social status.

Keywords: social status, social hierarchy, network cognition, network perception, experiments

1 Introduction
The unprompted, rapid, and reliable emergence of hierarchical relationships within human social groups (Gruenfeld & Tiedens, 2010; Leavitt, 2005) means that differences in social status exist in perhaps all human social environments (Anderson & Kilduff, 2009; Gould, 2002; Ridgeway, 1991). Across different social contexts, the person at the top of the status hierarchy enjoys numerous social (Magee & Galinsky, 2008), psychological (Pettit & Sivanathan, 2012), and even physiological benefits (von Rueden et al., 2010). The benefits of high status positions in conjunction with the ubiquity of status hierarchies not only lead to the expectation that people are able to detect status differences or recognize others’ status, but also that the recognition of the status of others is a crucial social skill in daily life.

Prior work on this topic has documented how physiological characteristics such as facial features (Chiao et al., 2008), height (Giessner & Schubert, 2007), and gender
(Ridgeway, 1991) are used to determine the status of others. However, since these characteristics may not be salient or discernable across all contexts, researchers have started exploring alternative cues of social status. One promising avenue of research into this issue is the determination of the status of others from their social interactions (Berger et al., 1972; Cheney & Seyfarth, 1990; Shariff et al., 2012). Individuals’ relational choices, or with whom people interact, are not only an important determinant of their social rank in their own right, but might also be used to determine the status of others in situations in which the physiological characteristics of group members are neither salient nor discernable (Mascaro & Csibra, 2012).

This association between the observation of social relationships and the determination of social status depends, to a certain degree, on the observer’s network cognition, which is how people perceive and mentally represent relational social structures such as social networks (De Soto, 1960; Janicik & Larrick, 2005). Focusing on the perception of networks implies that networks exist as a somewhat subjective phenomenon in the mind, or that people possess their own unique mental representations (Krackhardt, 1987) of the interpersonal relationships (de Klepper et al., 2017; Marineau, 2017; Smith et al., 2012). While the majority of research on this topic has focused on how this subjectivity can lead to heterogeneity in the situational awareness or perception of social ties (Brands, 2013), there is also evidence of variance in a person’s understanding or interpretation of a tie even when she is cognizant of a focal relationship (Betancourt & Wezel, 2016; Carnabuci et al., 2018; Flynn et al., 2010; Kilduff & Krackhardt, 1994). Thus, even when a person is fully aware of who is connected to whom within a group, differences in individuals’ mental representations of a social structure can lead to divergent understandings of the meaning of these connections. While inferring status from others’ network ties depends upon the recognition and perception of the pattern of interpersonal relationships that exists within a given group, this variance in judgment means that less is known about whether and the conditions under which relational information affects our status judgments of others.

This paper asks: What is the effect of social relationships on the status judgments of others? To answer this question, we turn to one of the seminal findings of the network cognition literature, which is that individuals typically rely on basic relational schemas or mental representations when making sense of network structures (De Soto et al., 1968; Janicik & Larrick, 2005; Krackhardt & Kilduff, 1999). Following prior experimental work which has shown that the direction and type of relationship trigger different relational schemas (Delia & Crockett, 1973), we theorize that variance in these two basic attributes of network ties should determine the type of relational schema that is used to make sense of the social relationships that connect different members of a group. Tie direction (defined as whether a tie is symmetric or asymmetric) is informative of a relationship’s reciprocity, which is whether the connected nodes share equally in the social interaction that takes place between them (Henley et al., 1969). The type of tie captures the kind of social connection that exists between nodes; it specifies the actual social interaction, such as influence, friendship, or advice. While friendship, influence, and advice ties all can be used to determine social rank, individuals differentially process information about these ties and thus may come to different conclusions about the appropriate status position for the people connected by these ties.
We investigated our research question in five experiments that allowed us to isolate and test for a causal effect of social relationships on status judgments. In all experiments, participants engaged in a network-learning task (De Soto, 1960) about the social relationships that exist between three hypothetical group members. Once the participant had demonstrated her understanding of the network, we then asked her questions about the status of the three group members. Study 1 sought to establish a link between the observation of social relationships and the resultant status judgments. Study 2 examined whether interpersonal differences rather than the experimental stimuli influenced status judgments based on social relationships. Studies 3a, 3b, and 4 refined the stimuli used in Studies 1 and 2; together, they provided further evidence that status judgments are based on social relationships, and that these judgments also vary with the type and direction of affiliations rather than being determined by the stimulus presentation. We found that the direction and type of social relationship independently and jointly influenced status judgments, and both caused participants to differ in the amount of status that they conferred on a group member.

We would like to be abundantly clear that our main assertion—that network structure influences status perception—is not new knowledge. Indeed, such a relationship has been assumed and taken-for-granted in the status literature (e.g., Podolny, 2001). In contrast, we believe that this paper is the first to demonstrate systematically the relationship between structure and perception, and the scope conditions thereof. Given that most observational data on status and networks suffer endogeneity issues, we employed an experimental framework in order to demonstrate that network cues cause assumptions about a person’s status. Moreover, we have uncovered an important boundary condition in the discernment of status from social relationships: We show that this process differs for symmetric and asymmetric social relationships. Thus, we clarify the conditions under which individuals’ relational choices become translated into status positions.

2 Theoretical background

Whenever a group of people interact, inequality develops in their status (Anderson et al., 2015), which is defined as the prestige granted to an individual because of her position in a social hierarchy (Gould, 2002). Such conferral of status on another person primarily is based on their visible traits, attributes, or actions that others deem desirable or valuable (Anderson et al., 2015; Cheng, Tracy, Foulsham, Kingstone, & Henrich; Fiske, 2010; Magee & Galinsky, 2008; Mazur, 1985).

Early sociometric researchers (e.g., Lemann & Solomon, 1952) endeavored to identify determinants of social status from the role of actors’ social relations, and proposed that differences in status can be inferred from counting the number of status deferrals that occurred in a group. While counting the number of group members who indicated whether they liked one another is one way of revealing the underlying structure of a group, research on network cognition subsequently has demonstrated that individuals tend to vary in how they encode, represent, and infer the meaning of affiliations (Delia & Crockett, 1973). As noted by Killworth and Bernard (1976), often there is a significant difference between the researcher’s view of social interactions and the individual’s view of the same phenomenon. Since this
paper's interest is in how an individual uses the ties of another when ranking that person, the issue of variance in the perception of affiliations looms large.

In order to use the network connections of others as an input in the conferral of status, individuals first must understand who is connected to whom within a group. While individuals do strive to learn the relationships that connect the different members of their social groups, the complexity of interpersonal network structures, such as their reciprocity or transitivity, can make it difficult to process information about them. As a result, people often use schemas when making sense of the networks that they observe. A schema is, informally, a pre-existing assumption about the way the world is ordered. De Soto and Kuether (1958, 1959) first provided evidence that people's cognition of social groups involves different schemas by demonstrating through a series of experiments that people often attribute linear properties to certain interpersonal relationships. For instance, the relationship of "liking" was seen as both symmetrical and transitive, meaning that if Bill liked Len, it was expected that Len liked Bill and also that they liked each other's friends. De Soto (1960) provided initial evidence of the presence of schemas through a paired associates learning experiment, in which the ease of learning of the network varied greatly with the presence of certain properties of the social relationship, such as its symmetry or transitivity.

Many studies subsequently have built on this insight, and the literature broadly agrees that people activate or use two basic relational schemas when analyzing or making sense of social relations (Janicik & Larrick, 2005). First, the balance schema cues people to perceive a network structure as reciprocal/symmetric and transitive. If there is a friendship relationship between A and B, then people would infer that A is friendly toward B, and that B is friendly toward A (symmetry). If B is also friends with C, people tend to infer that A is also friendly toward C (transitivity). Second, the linear-ordered schema cues a transitive and asymmetric/non-reciprocal mental representation of social relationships. If there is an advice relationship from A to B and another from B to C, then people would infer that A gives advice to C (transitivity) but would not infer that B or C must also give advice to A (asymmetry). These shortcuts may be considered default schemas, meaning that these are the basic structural assumptions by which people encode and represent information about relationships and networks (De Soto, 1960).

We propose that these basic relational schemas affect a person's judgment of another person's status. In essence, the way in which observers process information about social relationships influences how people rank others on the basis of their instrumental or social value, and thus influences the status inferences that might be drawn from them. When the linear-ordering schema is triggered, the resultant mental representation of the social relationships will involve different, non-overlapping positions that together resemble a ladder. This "vertical" schematic representation should facilitate the ranking of individuals, and we expect the person at the top of a vertical representation will be judged as superior to those below her; the person at the bottom as inferior to those above; and people in the middle as in between the two. Conversely, when the balance schema is activated, the observer will perceive some type of reciprocity in the social relationship, which means that the mental representation of the network will be "horizontal" or flat. As a result, there are no unique, non-overlapping positions that indicate the focal person's superiority over
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This horizontal mental representation should make it much harder for the observer to infer the status of the members of the network.

Studies examining social network schemas have found that the type and the direction of a social relationship indicate whether the observed social relationship is vertical or horizontal, and thus reliably cue either the linear-ordering or balance schema (De Soto, 1960; De Soto et al., 1968; Delia & Crockett, 1973; Krackhardt & Kilduff, 1999; Perry-Smith, 2014). The direction of a tie refers to whether a social relationship is reciprocated (symmetric) or proceeds in a single direction (asymmetric). De Soto and Kuethe (1959) (De Soto, 1960; De Soto & Kuethe, 1959) found that tie direction is informative of a relationship’s transitivity. Thus, when observers perceive an asymmetric social relationship, the linear-ordering schema is likely to be activated (De Soto, 1960; Janicik & Larrick, 2005). Conversely, the balance schema is cued by the observation of symmetric social relationships.

The type of affiliation refers to the social interaction that occurs between the connected persons. De Soto and Kuethe (1959) first provided evidence that people attribute linear properties to certain interpersonal relations. Dominance connoted asymmetrical and transitive relationships: if Tom dominated Bob, then it was expected that Bob could not dominate Tom, but Tom could dominate anyone else whom Bob could dominate. Liking and friendship, however, indicated a symmetrical and transitive relationship. Prior research has shown that the asymmetry inherent to advice and influence relations triggers the linear-ordering schema, whereas the implicit symmetry of friendship cues the balance schema (Delia & Crockett, 1973).

Combining these arguments, we expect an interactive relationship between the type and the direction of the observed social relationship. More specifically, we expect that asymmetric influence and advice relationships will trigger the linear-ordered schema. Under these conditions, the person who occupies the bottom position of a linear-ordered influence or advice network will be judged as the lowest status group member. Conversely, the person at the top of a linear-ordered influence or advice network will be judged as the highest status group member. However, we expect that symmetric influence and advice relationships will trigger the balance schema. Under these conditions, the difference in status between the two individuals that occupy the “end positions” of the network will be far less acute. Furthermore, we expect that both asymmetric and symmetric friendship relationships will trigger the balance schema such that the inherent reciprocity involved in friendship always leads to a more equal representation of a network.

3 Methodology

3.1 Studies overview

This paper examines the single and joint impact of the direction and type of social relationship on the status judgments of others across five experimental studies. Studies 1 and 2 build on an established experimental task introduced by De Soto (1960), and examine whether and to what extent manipulating the direction and type of social relationships that connect group members impacts participants’ determination of the group member’s social status. Studies 3a and 3b explore whether differences in the representation of the stimuli account for the effects reported in
Table 1. Summary of experimental studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Main finding</th>
<th>Experimental conditions</th>
<th>Between condition</th>
<th>Within condition</th>
</tr>
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</table>
| 1 & 2  | Participants’ mental representation of the network influences their status judgments of others | 1. Direction: Asymmetric; Symmetric  
2. Relationship-type: Neutral; Influence; Friendship; Cross (Influence × Friendship) | Direction, Relationship-type                | Status                                        |
| 3a & 3b| Different representations of the stimuli do not change how participants judge the status of others | 1. Direction: Asymmetric; Symmetric  
2. Relationship-type: Neutral; Influence; Friendship; Cross (Influence × Friendship)  
3. Reading order: Left to right, right to left | Direction, Relationship-type                | Status                                        |
| 4     | Gender-neutral and female names are judged similarly to the male names tested in Studies 1 and 2 | 1. Direction: Asymmetric; Symmetric  
2. Relationship-type: Neutral; Influence; Friendship; Cross (Influence × Friendship)  
3. Names of group members: Male, Female, neutral | Direction, Relationship-type, Names of group members | Status                                        |

Studies 1 and 2. Last, Study 4 tests whether differences in the hypothetical group members’ gender impacts these results. Table 1 provides an overview of these studies. Since the procedure, materials, dependent and theorized independent variables were the same across all studies, we first review this information and then discuss each study individually.

3.2 Procedure and materials

Participants engaged in a computer-based network-learning task (De Soto, 1960; Janicik & Larrick, 2005). Participants were told that they had to learn the social relationships that existed in a hypothetical group of three individuals: Edward, John, and Albert. No information other than these first names was given. Per trial, the computer displayed two of these names and the connection between them. For the directed conditions, the connection was represented as a one-way arrow (→). For the non-directed conditions, the connection was represented as a two-way arrow (↔). For example, in the directed conditions, the participants were shown the following
Asymmetric social relationship
Edward → John
John → Albert

Symmetric social relationship
Edward ↔ John
John ↔ Albert

Fig. 1. Depiction of social relationships between group members in experimental task in S1.

information: Edward → John. The participant was also informed of the type of relationship (influence/advice/friendship) that existed between the group members. For instance, in the friendship condition, the stimulus material stated: “Please take as much time as needed to understand the friendship relationship that exists between these two people” (emphasis added). The participants were given unlimited time to examine the stimulus material before advancing in their task. Please see Figure 1 for more information on the direction and type of relationship manipulation.

Participants then were shown a new screen on which the names and connection were displayed again. The participant was asked to judge if a given interpretation of the displayed relationship was correct. For example, in the influence condition, the participant was asked to indicate whether Edward influenced John based on the displayed relationship (e.g., Edward → John). We used the following relational verb phases: “does influence”/“does not influence”; “gives advice to”/“does not give advice to”; “is friendly towards”/“is not friendly towards.” After recording an answer, the participant was told whether the answer was correct. After the participant had been shown all possible relationships among the three individuals, the process was repeated until all relations had been correctly reported twice; we chose this threshold to decrease the possibility of chance performance (Janicik & Larrick, 2005). Together, these responses constituted the network learning measure. After learning the network, participants then were shown a diagram that displayed all relationships. They were asked to identify whether this diagram correctly represented the network that they had just learned. This question allowed us to confirm whether participants had paid attention and learned the network, or whether they mindlessly clicked through the study (i.e., the manipulation check).

Next—and only at this point in the study—were participants informed that they would be asked about the group members’ status. Following prior experimental work distinguishing dominance-based status (Halevy et al., 2012; Maner & Case, 2016) from social status (Pettit et al., 2013; Ridgeway & Erickson, 2000), we used the definition of social status as the PEAR—prestige, esteem, admiration, and respect—that an individual possessed within his or her group (Otner, 2017). Participants then were asked to indicate the focal individual’s prestige, esteem, admiration, and respect. Responses were recorded via a slider that had a starting point of 50 and end points of 0 and 100, and activity was required to enter a response (in other words, 50 was not registered by default). For each question, a diagram representing the different relationships was displayed at the top of the screen. See Figure 2 for more information on the presentation of the status questions.
Fig. 2. Status question used in S1 (variants of this question asked about esteem, admiration, and respect).

### 3.3 Measures

**Social status.** Status is measured as the mean amount of prestige, esteem, admiration, and respect that the observer thought the focal group member had. The question order was randomized across conditions. Cronbach’s alphas (for group members Edward, John, and Albert) for Study 1: 0.96; 0.93; 0.94; Study 2: 0.97; 0.95; 0.97; Study 3a: 0.96; 0.94; 0.95; Study 3b: 0.98; 0.96; 0.97; and Study 4: 0.95, 0.94, 0.95.

**Direction of relationship.** The direction of the relationship was a binary variable. 0 indicated an asymmetric relationship, and 1 indicated a symmetric relationship.

**Type of relationship.** We used two different nominal variables to measure the type of relationships. In Studies 1 and 3a, we examined influence (coded as 1); advice (coded as 2); and friendship (coded as 3) relationships. In Studies 2, 3b, and 4, the nominal variable captured neutral (coded as 1); influence (coded as 2); friendship (coded as 3); and crossed or influence and friendship (coded as 4) relationships.1

### 3.4 Study 1

We began by examining whether the direction and type of observed social relationship influence observers’ status judgments of others (the connected group members).

**Participants and design.** This study examined the impact of the type and direction of a social relationship on observers’ status judgments. Two-hundred-forty-seven participants (118 women, 129 men, $M_{age} = 34$, $SD = 0.11$) participated in a human intelligence task (HIT) on Amazon’s Mechanical Turk (M-Turk) website, for US$1 in compensation. All participants previously had acted in at least 2,000 tasks with a 98% approval rating or higher, meaning that they have a reputation for completing tasks attentively and efficiently. Upon initial inspection of the data, six participants

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1 We would like to thank an anonymous reviewer for suggesting the inclusion of the crossed condition, representing the co-occurrence of different types of social relationships.
were removed from this sample for taking too long to complete the study (over 60 minutes each, when the mean time was 10 minutes). One participant was removed for failing to answer correctly a manipulation check question. This left a final sample of 240.

Participants were randomly assigned to one of six conditions (type of relationship: influence vs. advice vs. friendship) × (direction of relationship: directed vs. non-directed) in a mixed between/within experimental design (Field & Hole, 2002). The “between” designation of the experimental design means that the manipulated variables (i.e., the type and the direction of social relationships) varied across participants. The “within” designation usually refers to a manipulation that takes place within the study leading to within-participant variance. We did not manipulate the participants’ judgments of the status of three different group members. However, since observers’ judgments of a group member’s (Edward, John, and Albert) status might depend on the status allocated to the other group members, we conceptualized the observers’ status judgments as varying within subjects. A multivariate analysis of variance (i.e., MANOVA) confirmed this intuition as there were significant differences in the group members’ status ranking \(F(1, 239) = 132.70; p < 0.001; \eta^2 = 0.36\). Edward’s status was rated higher than John’s \(p = 0.01\) and Albert’s \(p < 0.001\), while John’s status rating also differed significantly from Albert’s \(p < 0.001\). To prevent potential bias in the estimates that might result from this dependence, we treated the differences between the status ratings of the three group members as varying within-condition.

We therefore used a repeated ANOVA with a nominal variable (1 = influence; 2 = advice; 3 = friendship) and a dummy-coded variable (0 = asymmetric; 1 = symmetric) that reflected assignment to the experimental conditions. Because Mauchly’s (1940) epsilon is above 0.75, we used the Huynh–Feldt correction (Girden, 1992). Table S1 (Please see the on-line supplement for this table and for all tables with the S prefix) reports the descriptive statistics and correlations. Table 2 reports the means for the three dependent variables (Edward, John, and Albert’s status) per experimental condition.

**Results.** We first report the between-subject test of our manipulations before discussing the within-subject analysis. The results revealed a significant between-subjects effect of the type of interaction \(F(1, 239) = 5.17; p < 0.01; \eta^2 = 0.04\), but neither the direction of the tie \(F < 1\) nor the interaction between them \(F(1, 239) = 1.29; p = 0.276\) were significant predictors. We interpret these results as indicating that participants gave similar ratings to symmetric and asymmetric ties across the influence, advice, and friendship conditions for all three group members. While the between-subject effects are intriguing, the paper’s theoretical predictions are mainly concerned with the differences in status that exist across the group members. We predicted that observers’ status judgments would vary with the direction of the tie. When a tie is asymmetric, the person (Edward) at the top of the vertical or linear mental representation of the network would be perceived as superior to the other group members and consequently judged as having more status than the other two group members. The person (John) in the middle would be perceived as subordinate and thus judged as lower in status than Edward; John would be perceived as superior and thus higher in status than the other group
Table 2. Study 1—Group means and standard deviations across experimental conditions.

<table>
<thead>
<tr>
<th></th>
<th>Asymmetric</th>
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<th></th>
<th>Symmetric</th>
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<tbody>
<tr>
<td></td>
<td>Influence</td>
<td>Advice</td>
<td>Friendship</td>
<td>Influence</td>
<td>Advice</td>
<td>Friendship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Status: Group member 1</td>
<td>83.15 (18.62)</td>
<td>85.76 (15.61)</td>
<td>56.59 (22.55)</td>
<td>55.36 (13.36)</td>
<td>60.13 (16.56)</td>
<td>57.04 (12.03)</td>
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<td></td>
</tr>
<tr>
<td>2. Status: Group member 2</td>
<td>58.08 (12.93)</td>
<td>60.13 (13.26)</td>
<td>58.63 (18.24)</td>
<td>60.33 (12.93)</td>
<td>66.17 (17.32)</td>
<td>64.88 (15.07)</td>
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</tr>
<tr>
<td>3. Status: Group member 3</td>
<td>27.37 (22.48)</td>
<td>30.03 (18.99)</td>
<td>46.43 (25.06)</td>
<td>47.98 (12.31)</td>
<td>55.58 (13.97)</td>
<td>48.80 (11.62)</td>
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<td>n</td>
<td>40</td>
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</table>

Group member 1: Edward; Group member 2: John; Group member 3: Albert.
The perception of status

member (Albert). The person (Albert) occupying the bottom position would be perceived as subordinate to the other two group members (Edward and John) and thus judged as lowest in status. When a tie is symmetric, we find a different pattern. As network centrality would predict, the person (John) in the middle of the horizontal mental representation, i.e., the most central group member, would be accorded the most status in the group because she has two ties, while the people on the end positions only have one tie. The person (Edward) at the beginning and the person (Albert) at the end of the horizontal chain would be roughly similar in status to each other and both would be of lower status than John.

The results of the repeated measures ANOVA indicated a strong within-subject main effect of the direction of the relationship on the status of the three group members ($F(1, 239) = 63.35; p < 0.001; \eta^2 = 0.21$). Participants judged Edward’s status in the symmetric condition ($M = 57.78; SD = 1.17$) to be significantly lower ($F(1,239) = 66.21; p < 0.001$) than his status in the asymmetric condition ($M = 76.02; SD = 1.17$). Participants rated John as significantly higher status ($F(1, 239) = 47.65; p < 0.05$) in the symmetric conditions ($M = 66.08; SD = 1.05$) than in the asymmetric conditions ($M = 58.01; SD = 1.05$). Participants’ evaluations of Albert’s status were also significantly higher ($F(1,239) = 47.65; p < 0.001$) in the symmetric ($M = 52.73; SD = 1.23$) than in the asymmetric condition ($M = 33.35; SD = 1.23$). Thus, as predicted, Edward occupied the top position, John the middle, and Albert the bottom position of the social hierarchy that was based on asymmetric ties. As predicted, John occupied the top position of the status hierarchy based on symmetric ties. However, Edward occupied the middle position followed by Albert, indicating that even when a relationship is reciprocated, hierarchies still form.

Our theory predicts that the observer’s status judgments would vary with the type of social relationship. The influence and advice conditions would yield a similar pattern of effects to the asymmetric ties discussed in the prior paragraph; the friendship condition pattern would be similar to the symmetric ties. In line with this prediction, the within-subject analysis revealed a significant within-subject main effect of relationship type on the status of the three group members (Edward, John, and Albert) ($F(1, 239) = 11.70; p < 0.001; \eta^2 = 0.09$). Participants in the influence ($M = 69.25; SD = 21.33$) and advice conditions ($M = 72.94; SD = 20.54$) were significantly more positive ($F(1, 239) = 20.21; p < 0.001$) in their evaluation of Edward’s status than in the friendship condition ($M = 56.81; SD = 17.96$). Likewise, participants rated Albert significantly lower ($F(1, 239) = 6.01; p < 0.01$) in the influence ($M = 37.67; SD = 20.78$) and advice ($M = 42.80; SD = 20.97$) conditions than in the friendship ($M = 47.62; SD = 19.45$) condition. While there was no significant difference in the judgments of John’s status across the three conditions ($F(1, 239) = 1.40; p = 0.248$), participants did rate John as the highest status group member in the friendship condition ($M = 61.75; SD = 16.92$). These results are broadly in line with our prediction that observers’ judgments of others’ status vary with the type of relationship.

This pattern of effects is qualified by a significant two-way interaction ($F(1,239) = 13.64; p < 0.0001; \eta^2 = 0.10$) between the type and the direction of the relationship, indicating that the effect of the type of relationship varied systematically with the direction of the relationship. A planned contrast testing the simple main effects, the exploration of the interaction via the repeated ANOVA, was supportive of a
differential effect of asymmetric versus symmetric ties. Specifically, when the tie that
connected Edward to John was symmetric, participants rated Edward’s status much
lower on average in both the influence ($F(1,239) = 54.65; p < 0.000; M = −27.78; SD = 3.76$) and advice ($F(1,239) = 47.49; p < 0.000; M = −25.64; SD = 3.76$) conditions
than when the tie was asymmetric. Interestingly, there was no effect of the direction
of the tie in the friendship condition ($F < 1; M = −0.44; SD = 3.76$), which we
interpret as signifying that the implicit symmetrical nature of friendship moderated
the effect of the asymmetric stimulus. Conversely, when the social relationship was
symmetric, participants judged the social status of Albert to be significantly higher in
both the influence ($F(1,239) = 25.78; p < .0001; M = 20.61; SD = 4.05$) and advice
($F(1,239) = 39.63; p < .0001; M = 25.55; SD = 4.05$) conditions. There was no
significant difference across the direction of ties in the friendship condition ($F < 1$).

In contrast to Edward and Albert, there was only a marginally significant
difference in the evaluation of John in the advice ($F(1,239) = 3.19; p < 0.10$)
and friendship ($F(1,239) = 3.42; p < 0.10$) conditions, and no significant difference
in the influence condition ($F(1,239) < 1$).

**Discussion.** This study was designed to test whether participants’ status judgments
were affected by differences in the type and the direction of social relationships.
Consistent with our theoretical expectations, these variables and their interaction
strongly affected the observers’ status judgments. These results support our argument
that the type and direction of ties cue different mental representations of the network
that connects Edward, John, and Albert to one another, and led to variance in the
status positions that these group members occupied. Moreover, as expected, the
inherent reciprocity involved in friendship reliably cued the balance schema even
when the group members were connected to one another by asymmetric ties.

### 3.5 Study 2

**Objective.** Study 1 suggested that the direction and type of social relationship
influenced observers’ status judgments of others. In the remaining studies, we sought
to demonstrate experimentally that this effect stems from people’s relational schemas
rather than between-participants differences (this study) or how the stimulus was
represented (Studies 3a, 3b, and 4).

Study 2 adds the following refinements to the experimental design used in the
prior study. First, since participant’s English language proficiency might influence
the results if low fluency participants do not understand the stimulus, we added two
questions at the end of the study that asked whether (i) the participant was a native
English speaker and (ii) whether English was the dominant language in that person’s
secondary school. Only participants who answered “yes” to both questions were
retained. Second, participants’ culture, age, or gender might have led to variance in
the status ranking of others. These variables often play a significant role in status
assessments, and while random assignment to conditions may have neutralized any
biasing effect, explicitly controlling for their potential impact of these constructs
would demonstrate the robustness of our effect. Therefore, in this study, we added

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2 We thank an anonymous reviewer for suggesting this criterion.
The perception of status

Participants and design. This study examined the impact of the type and direction of a social relationship on observers’ status judgments. Three-hundred-seventy-three participants (161 women, 212 men, $M_{age} = 37, SD = 10.96$) participated in a HIT on Amazon’s M-Turk website, for US$1 in compensation. Upon initial inspection of the data, 40 participants were removed from this sample for failing at least one English language proficiency question. Three participants were removed for taking too long to complete the study (over 20 minutes each, when the mean time was 5 minutes). Ten participants were removed for failing to answer correctly a manipulation check question. This left a final sample of 320.

Participants were randomly assigned to one of eight conditions [(relationship-type: neutral vs. influence vs. friendship vs. crossed) × (direction: asymmetric vs. symmetric)] in a mixed between/within design. A MANOVA again found a significant difference in the group members’ status ranking ($F(1,320) = 9.87; p < 0.01; \eta^2 = 0.57$), and we used a repeated ANOVA with a nominal variable (1 = neutral; 2 = influence; 3 = friendship; 4 = crossed) and a dummy-coded variable (0 = asymmetric; 1 = symmetric) that reflected assignment to the experimental conditions. We also included three covariates as controls: gender (1 = male; 2 = female); age; and culture (proxied by geographic location). We followed the U.S. census and coded American participants as follows: 1 = participant lives in the Northeast; 2 = the Midwest; 3 = the South; and 4 = the West; 5 = all non-U.S. participants. Because Mauchly’s epsilon was above 0.75, we used the Huynh–Feldt correction. Table S2 reports the descriptive statistics and correlations. Table 3 reports the means for the three dependent variables per experimental condition.

Results. The results revealed no significant between-subjects main effect of the direction ($F = 1.21$) or type of relationship ($F < 1$), no significant interaction between them ($F < 1$), and no significant effect of the control variables ($F < 1$ for gender and age; $F = 1.99$ for geographic area). The within-subjects analysis indicated a strong within-subject main effect of the direction of the relationship on the status of the three group members ($F(1,319) = 53.08; p < 0.001; \eta^2 = 0.15$), and a significant within-subject main effect of relationship type ($F(1,319) = 6.88; p < 0.001; \eta^2 = 0.06$). These main effects were qualified by a significant two-way interaction between them ($F(1,319) = 8.39; p < 0.001; \eta^2 = 0.01$). Before delving into the effects of the two-way interaction, it is worth noting that none of the control variables had a significant effect on others’ status judgments.

In terms of the interaction, a planned contrast testing the simple main effects was supportive of a differential effect of asymmetric versus symmetric social relationships across the different types of ties. In line with the results of Study 1, Edward was ranked lower in the neutral ($F(1,319) = 6.52; p < 0.01; M = -10.78; SD = 4.22$), influence ($F(1,319) = 38.08; p < 0.000; M = -26.23; SD = 4.25$), and crossed
Table 3. Study 2—Group means and standard deviations across experimental conditions.

<table>
<thead>
<tr>
<th>Status: Group member 1</th>
<th>Asymmetric</th>
<th></th>
<th></th>
<th></th>
<th>Symmetric</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Neutral</td>
<td>Influence</td>
<td>Friendship</td>
<td>Cross</td>
<td>Neutral</td>
<td>Influence</td>
<td>Friendship</td>
<td>Cross</td>
</tr>
<tr>
<td>1. Status: Group member 1</td>
<td>68.64 (26.27)</td>
<td>85.18 (15.70)</td>
<td>58.65 (22.07)</td>
<td>81.27 (15.86)</td>
<td>57.85 (18.69)</td>
<td>58.94 (15.89)</td>
<td>56.43 (13.67)</td>
<td>60.84 (19.57)</td>
</tr>
<tr>
<td>2. Status: Group member 2</td>
<td>60.17 (12.05)</td>
<td>59.17 (14.40)</td>
<td>59.01 (17.95)</td>
<td>60.12 (10.08)</td>
<td>66.95 (17.05)</td>
<td>60.69 (15.63)</td>
<td>62.26 (16.59)</td>
<td>61.94 (14.59)</td>
</tr>
<tr>
<td>3. Status: Group member 3</td>
<td>46.06 (28.51)</td>
<td>28.25 (20.95)</td>
<td>44.59 (24.70)</td>
<td>28.29 (17.90)</td>
<td>48.18 (19.94)</td>
<td>53.33 (17.01)</td>
<td>49.04 (13.69)</td>
<td>53.97 (16.74)</td>
</tr>
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</tr>
</tbody>
</table>

Group member 1: Edward; Group member 2: John; Group member 3: Albert.
The perception of status

15

\( (F(1, 319) = 23.40; p < 0.001; M = -20.43; SD = 2.98) \) conditions when the relationship was symmetric. Moreover, as in Study 1, there were no significant differences in evaluation in the friendship condition \((F < 1)\). Albert was ranked higher in the influence \((F(1, 319) = 29.71; p < 0.000; M = 25.08; SD = 4.60)\) and crossed \((F(1, 319) = 31.55; p < 0.000; M = 25.68; SD = 4.57)\) conditions when the relationship was symmetric, there were no significant differences between asymmetric neutral and symmetric neutral or friendship relationships \((F < 1)\). Last, while there were no significant differences in John's ranking in the influence and crossed conditions \((F < 1)\), he was ranked higher in the symmetric neutral \((F(1, 319) = 3.89; p < 0.05; M = 6.78; SD = 3.43)\) and friendship \((F(1, 319) = 3.42; p < 0.05; M = 3.65; SD = 3.32)\) conditions. Thus, when the linear-ordered schema was cued by asymmetric ties or relationships, Edward, who occupied the top-most position in the vertical mental representation of the network, was allocated the most status followed by John and then Albert, who occupied the bottom-most position. Conversely, when the balance schema was cued by symmetric ties or relationships, John, who occupied the middle position, had the most status conferred on him, followed by Edward and then Albert, who occupied the end positions.

Discussion. This study examined whether differences in the type and direction of social relationships impact participants' status judgments of others when controlling for gender, age, culture, and English-language proficiency. In line with our theoretical expectations, the effect of a group member's social relationships on an observer's status judgments was robust to the inclusion of typical status indicators deployed as control variables.

3.6 Study 3a

Objective. The purpose of Study 3 was to replicate the results of Studies 1 and 2 while addressing an alternative explanation for these results. It is possible that observers' status judgments could have been driven by the representation of the stimulus and not by the theorized link between the relational schemas and the inference of hierarchy. The reading order for the stimulus material was left to right, which is the default reading order in the English language. Participants might have been influenced in the ranking of the group members by this default reading order. Also, presenting one relationship above another relationship might have helped participants to make inferences about them. Study 3 addresses these issues by presenting the stimulus horizontally and from right to left. For example, participants were shown the following information: John ← Edward. Other than the revised stimulus, Study 3a used the same design as Study 1. Study 3b used the same stimulus as Study 3a while controlling for gender, age, culture, and English-language proficiency. Study 3b also manipulated the reading order so that the stimulus was presented from right to left and left to right (Study 3a only presents the stimulus from right to left) and added a crossed condition. Figure 3 has additional information on the revised designs.

Participants and design. Two-hundred-forty-six participants from Amazon M-Turk (118 female, 128 male; \( M_{age} = 34, SD = 0.11 \)) were randomly assigned to one of
Asymmetric social relationship
Albert ← John ← Edward

Symmetric social relationship
Albert ↔ John ↔ Edward

Fig. 3. Depiction of social relationships between group members in experimental task in S3a and S3b (right to left reading order and names displayed horizontally).

six conditions. Upon initial inspection of the data, two participants were removed from this sample for taking too long (over 60 minutes each, when the average time of participation was 10 minutes). Three participants were removed for failing the manipulation check. Last, one participant was removed because analysis of geolocation data (longitude, latitude, and ISP address) revealed that she had participated in Study 1. The final sample was 240 participants.

Results. Since a MANOVA found significant differences in the group members’ status ranking \((F(1,239) = 128.34; p < 0.001; \eta^2 = 0.35)\), we used a repeated ANOVA with a nominal variable (1 = influence; 2 = advice; 3 = friendship) and a dummy-coded variable (0 = asymmetric relationship; 1 = symmetric relationship) that reflect assignment to the experimental conditions, and Huynh–Feldt correction when Mauchly’s epsilon was larger than 0.75. Table S3 reports the descriptive statistics and bivariate correlations. Table 4 reports the means per experimental condition.

We first report the results of the between-subjects analysis. The main effect of the type of relationship was not significant \((F < 1)\), while the main effect of the direction of the relationship \((F(1,239) = 9.88; p < 0.01; \eta^2 = 0.04)\) was significant. Participants rated the group members’ status higher in the symmetric condition \((M = 5.02, SD = 1.57)\) than in the asymmetric condition. We believe this change occurred because the reading order of the stimulus was altered. The interaction between relationship type and direction was not significant \((F(1,239) = 1.91; p = 0.15)\).

The results of the within-subjects analysis revealed a similar pattern to Studies 1 and 2. There was a non-significant main effect of the type of relationship \((F < 1)\) and a highly significant main effect of the direction of relationship \((F(1, 239) = 25.65; p < 0.001 \eta^2 = 0.11)\). These results are qualified by a significant interaction between the type and the direction of the relationship \((F(1,239) = 4.81; p < 0.01; \eta^2 = 0.04)\). A planned contrast testing the simple main effects was supportive of a differential effect of asymmetric versus symmetric social relationships. When the social relationship was asymmetric, participants rated Edward’s status much higher in the influence \((F(1,239) = 34.53; p < .0001; M = 81.59; SD = 3.05)\), advice \((F(1,239) = 16.93; p < .0001; M = 78.44; SD = 3.05)\), and friendship conditions \((F(1,239) = 9.50; p < 0.002; M = 70.59; SD = 3.05)\) than when the social relationship was symmetric (influence: \(M = 56.21; SD = 3.05\); advice: \(M = 60.68; SD = 3.05\); friendship: \(M = 57.28; SD = 3.05\)). Conversely, John and Albert were ranked lower in the asymmetric than in the symmetric conditions. Participants judged the social status of John to be significantly lower when the social relationship linking John to Edward and Albert was asymmetric in the influence \((F(1,239) = 13.49; p < 0.001)\) and friendship \((F(1,239) = 16.27; p < 0.001)\) conditions, but not in the advice
Table 4. Study 3a—Group means and standard deviations across experimental conditions.

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<th>Symmetric</th>
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<td></td>
<td>Influence</td>
<td>Advice</td>
<td>Friendship</td>
<td>Influence</td>
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<tr>
<td>1. Status: Group member 1</td>
<td>81.59 (18.04)</td>
<td>78.44 (17.53)</td>
<td>70.59 (21.97)</td>
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<td>2. Status: Group member 2</td>
<td>56.12 (13.24)</td>
<td>61.33 (16.03)</td>
<td>53.77 (15.03)</td>
<td>70.28 (20.88)</td>
</tr>
<tr>
<td>3. Status: Group member 3</td>
<td>24.44 (21.03)</td>
<td>36.31 (20.75)</td>
<td>35.54 (23.54)</td>
<td>59.32 (21.65)</td>
</tr>
<tr>
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</table>

Group member 1: Edward; Group member 2: John; Group member 3: Albert.
condition ($F(1,239) = 1.18; p = 0.278$). Participants similarly judged the social status of John to be significantly lower when the social relationship was asymmetric in the influence ($F(1,239) = 61.34; p < 0.001$), advice ($F(1,239) = 12.31; p < 0.001$), and friendship ($F(1,239) = 14.89; p < 0.001$) conditions.

Even though the stimulus was represented horizontally, and the reading-order was right to left, the pattern of within-effects predicted by our theory persisted. When there was an asymmetric tie or relationship, which cued the linear-ordering schema, the person who fit into the top-most position of the vertical mental representation of the network (Edward) was judged the highest status group member. Furthermore, after Edward, the group-member who occupied the middle position (John) was ranked higher than Albert, who occupied the bottom-most position. Yet when the balance schema was triggered by symmetric ties or relationships, John, who occupied the middle position of the horizontal mental representation, was the highest ranked group member, followed by Edward and then Albert, who occupied the end positions.

**Discussion.** While this pattern of results predominantly is similar to Studies 1 and 2, such as the status differences between group members being far greater for asymmetric than symmetric social relationships, there are some differences. For instance, participants focused more on the direction of the relationship than the type of relationship. One potential explanation for these differences is that participants might not have fully understood the stimulus. Study 3b addressed this issue by controlling for English-language proficiency and gender, age, and culture. Study 3b also manipulated the reading order such that the stimulus was presented from both right to left and left to right, and also added a crossed and neutral condition.

### 3.7 Study 3b

**Participants and design.** Six-hundred-seventy-two participants from Amazon M-Turk (396 female, 276 male; $M_{age} = 35, SD = 0.10$) were randomly assigned to one of 16 conditions. Upon initial inspection of the data, two participants were removed for taking too long (over 60 minutes each, when the average time of participation was 10 minutes), four were removed for failing the manipulation check, and 26 were removed from this sample for failing at least one of the English proficiency questions. The final sample was 640 participants.

**Results.** We used a repeated ANOVA with a nominal variable (1 = neutral; 2 = influence; 3 = friendship; 4 = crossed) and two dummy-coded variables (Direction: 0 = asymmetric relationship; 1 = symmetric relationship; Reading-order: 0 = left to right; 1 = right to left) that reflected assignment to the experimental conditions. The Huynh–Feldt correction was used when Mauchly’s epsilon was larger than 0.75. Table S4 reports the descriptive statistics and bivariate correlations. Table 5 reports the means per experimental condition.

We first report the results of the between-subjects analysis. The relationship's direction had a significant and positive effect ($F(1,639) = 24.14; p < 0.001; \eta^2 = 0.04$). Participants rated the group members’ status higher in the symmetric condition ($M = 4.78, SD = 0.67$) than in the asymmetric condition. All other variables and their interactions did not have a significant effect. While this between-effect is similar
Table 5. Study 3b—Group means across experimental conditions and measures.

<table>
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</thead>
<tbody>
<tr>
<td></td>
<td>Neutral</td>
<td>Influence</td>
<td>Friendship</td>
<td>Cross</td>
<td>Neutral</td>
<td>Influence</td>
<td>Friendship</td>
<td>Cross</td>
</tr>
<tr>
<td>1. Status: Group member 1</td>
<td>62.23 (12.13)</td>
<td>79.68 (21.51)</td>
<td>59.55 (21.77)</td>
<td>83.17 (17.24)</td>
<td>57.61 (13.99)</td>
<td>51.44 (17.77)</td>
<td>56.74 (17.62)</td>
<td>61.87 (20.25)</td>
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<tr>
<td>2. Status: Group member 2</td>
<td>56.31 (23.23)</td>
<td>58.46 (12.44)</td>
<td>62.79 (15.64)</td>
<td>57.04 (10.97)</td>
<td>65.88 (13.96)</td>
<td>58.17 (18.87)</td>
<td>67.29 (18.47)</td>
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</tr>
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<td>3. Status: Group member 3</td>
<td>52.76 (22.40)</td>
<td>28.35 (23.14)</td>
<td>48.38 (23.58)</td>
<td>33.18 (22.38)</td>
<td>49.35 (13.32)</td>
<td>47.27 (15.47)</td>
<td>54.05 (17.84)</td>
<td>60.85 (20.43)</td>
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Reading order: Left to right

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<th>Symmetric</th>
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<td>Neutral</td>
<td>Influence</td>
<td>Friendship</td>
<td>Cross</td>
<td>Neutral</td>
<td>Influence</td>
<td>Friendship</td>
<td>Cross</td>
</tr>
<tr>
<td>1. Status: Group member 1</td>
<td>60.56 (17.13)</td>
<td>76.67 (17.52)</td>
<td>55.85 (17.05)</td>
<td>78.11 (15.75)</td>
<td>57.28 (13.47)</td>
<td>56.50 (16.31)</td>
<td>62.65 (15.25)</td>
<td>59.30 (16.65)</td>
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<tr>
<td>2. Status: Group member 2</td>
<td>55.42 (21.93)</td>
<td>60.57 (11.35)</td>
<td>64.55 (16.39)</td>
<td>57.35 (11.06)</td>
<td>70.17 (19.02)</td>
<td>70.38 (19.73)</td>
<td>74.82 (14.65)</td>
<td>63.85 (16.78)</td>
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<tr>
<td>3. Status: Group member 3</td>
<td>51.01 (25.21)</td>
<td>32.79 (20.09)</td>
<td>41.72 (27.12)</td>
<td>31.61 (29.85)</td>
<td>56.81 (14.42)</td>
<td>57.389 (16.82)</td>
<td>61.37 (15.47)</td>
<td>59.79 (18.04)</td>
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<td>40</td>
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<td>40</td>
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</tr>
</tbody>
</table>

Reading order: Right to left

Group member 1: Edward; Group member 2: John; Group member 3: Albert.
to that reported in Study 3a, it does vary from those described in Studies 1 and 2. We believe that this change is related to the change in the reading order of the stimulus.

The results of the within-subjects analysis revealed a similar pattern to the prior studies (see Table S5). First, gender, age, and culture did not have a significant effect on the judgments of others’ status. Second, while controlling for these factors, the reading order of the stimulus \( F(1, 639) = 1.92; p = 0.15; \eta^2 = 0.01 \) and its interactions with the other variables, including a three-way interaction between reading order, direction, and type \( F < 1 \) did not significantly impact participants’ ranking of the group members. Third, and as predicted from theory, the direction \( (F(1, 639) = 96.72; p < 0.001; \eta^2 = 0.14) \) and type of relationship \( (F(1, 639) = 22.46; p < 0.001; \eta^2 = 0.10) \) and their interaction \( (F(1, 639) = 26.62; p < 0.001; \eta^2 = 0.12) \) did significantly affect the determination of others’ status. A planned contrast test found that when the tie was asymmetric, participants rated Edward’s status higher in the influence \( (F(1, 639) = 56.52; p < 0.001; MD = +24.21; SD = 2.15) \) and crossed conditions \( (F(1, 639) = 49.79; p < 0.001; MD = +20.05; SD = 2.04) \) but not in the neutral \( (F = 1.74; p = 0.18) \) or friendship conditions \( (F < 1) \).

Conversely, John and Albert were ranked lower in the asymmetric influence (John: \( F(1, 639) = 3.10; p < 0.08; MD = −4.76; SD = 2.70 \); Albert: \( F(1, 639) = 40.29; p < 0.001; MD = −22.02; SD = 3.47) \) and crossed conditions (John: \( F(1, 639) = 26.85; p < 0.001; MD = −12.34; SD = 2.38 \); Albert: \( F(1, 639) = 83.17; p < 0.001; MD = −27.93; SD = 3.06). John was more positively ranked in the symmetric neutral condition \( (F(1, 639) = 7.53; p < 0.01; MD = +24.32; SD = 2.41) \), and John and Albert were more positively ranked in the symmetric friendship condition (John: \( F(1, 639) = 8.55; p < 0.01; MD = 7.39; SD = 2.53 \); Albert: \( F(1, 639) = 15.23; p < 0.001; MD = +12.66; SD = 3.24 \)).

This pattern of effects is largely in line with our theoretical reasoning. As expected, when an asymmetric tie or relationship triggers the linear-ordered schema, Edward is ranked higher than John, who is ranked higher than Albert. Conversely, when the balance schema was cued by symmetric ties or relationships, John is ranked higher than either Edward or Albert. Moreover—and unlike in the prior studies—Edward and Albert were ranked similarly to each other.

**Discussion.** After controlling for gender, age, and English-language proficiency, both the direction and type of the relationship and their interaction were significant predictors of the status of others. This finding provides evidence that the absence of an effect of the type of relationship in Study 3a may have been due to these confounding factors. In addition, when the reading-order was manipulated, it had no significant effect on the ranking of the group members. This provides further support to this paper’s argument that the effect of these variables on others’ status judgments stems from differences in the relational heuristics invoked by the stimulus, and not from the representation of the stimulus itself.

### 3.8 Study 4

**Objective.** The results of Studies 1 to 3b support our argument that observers’ status judgments are based on the social relationships that exist within a group,
and that the valence of these judgments is impacted by their direction and type. One limitation of these studies is that the gender of the stimulus names always was male. While this has the advantage of keeping gender constant, gender is a salient social category that often is evoked by the visual processing of a name and acts as a status characteristic. As a result, how participants judge the status of others could differ depending on whether the focal group member was not male. To test the robustness of our results, we changed the hypothetical group member names to either female (Maria, Susan, and Linda) or gender-neutral (Morgan, Jesse, and Pat).

The experiment was in all other respects identical to the previous studies.

Participants and design. Five-hundred-forty-seven participants from Amazon M-Turk (326 female, 222 male; $M_{age} = 35$, SD 0.10) were randomly assigned to one of 16 conditions. Upon initial inspection of the data, five participants were removed for taking too long (over 30 minutes each, when the average time of participation was 9 minutes); five participants were removed because analysis of their user IDs revealed that they had previously participated in Studies 1–3b; four participants were removed for failing the attention check; and 53 participants were removed for failing one or more of the English proficiency questions. The final sample consisted of 480 participants.

Results. We used a repeated ANOVA with nominal (1 = neutral; 2 = influence; 3 = friendship; 4 = crossed) and dummy-coded variables (Direction: 0 = asymmetric; 1 = symmetric; Gender names: 0 = female names; 1 = male names) that reflected assignment to experimental conditions. The Huynh–Feldt correction was used when Mauchly’s epsilon was larger than 0.75. Table S5 reports the descriptive statistics and bivariate correlations. Table 6 reports the means per experimental condition. There were no significant between-participants effects of the control or independent variables. There were no significant within-participant effects of participant gender ($F < 1$), age ($F < 1$), or culture ($F = 1.28$). There were significant main and interactive effects of the gender of the group members with the direction and type of tie (Gender: $F(1,479) = 25.67; p < 0.001; \eta^2 = 0.05$; Direction: $F(1,479) = 49.88; p < 0.001; \eta^2 = 0.04$; Type: $F(1,479) = 15.95; p < 0.001; \eta^2 = 0.10$; Gender × Direction × Type: $F(1,479) = 4.58; p < 0.001; \eta^2 = 0.03$). A simple slopes analysis of the three-way interaction revealed that participants judged the neutral names more negatively than the female names in the asymmetric neutral (Morgan (GM 1): $F(1,479) = 3.23; p < 0.10; MD = -11.90; SD = 3.63$), asymmetric influence (Jesse (GM 2): $F(1,479) = 28.78; p < 0.01; MD = -23.07; SD = 3.02$), and asymmetric crossed (Jesse (GM 2): $F(1,479) = 36.65; p < 0.001; MD = -25.81; SD = 3.02$) conditions. Unlike the prior studies (1–3b), the person at the bottom of the vertical chain (here, Pat; Albert in prior studies) invoked in the linear-ordered heuristic, was ranked higher than the person in the middle of the vertical chain (here, Jesse; John in prior studies), in the asymmetric influence ($F(1,479) = 22.07; p < 0.001; MD = +22.99; SD = 3.43$) and asymmetric crossed ($F(1,479) = 66.69; p < 0.001; MD = +39.63; SD = 3.24$) conditions. While the pattern of effects in the symmetric conditions largely matched those of the prior studies (1–3b), it is worth noting that Jesse, the person in the middle of the horizontal chain triggered by friendship, was viewed more negatively in the asymmetric friendship condition ($F(1,479) = 3.79$; ...
Table 6. Study 4—Group means across experimental conditions and measures.

<table>
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<td>Neutral</td>
<td>Influence</td>
<td>Friendship</td>
</tr>
<tr>
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<td>1. Status: Group member 1</td>
<td>69.15 (21.04)</td>
<td>82.84 (13.02)</td>
<td>47.33 (27.09)</td>
<td>85.52 (16.42)</td>
<td>58.38 (17.66)</td>
<td>58.36 (21.73)</td>
</tr>
<tr>
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<td></td>
<td>2. Status: Group member 2</td>
<td>57.66 (13.69)</td>
<td>60.40 (13.21)</td>
<td>63.18 (15.26)</td>
<td>56.07 (10.07)</td>
<td>70.38 (20.47)</td>
<td>70.29 (15.81)</td>
</tr>
<tr>
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<td></td>
<td>3. Status: Group member 3</td>
<td>40.20 (19.65)</td>
<td>34.87 (20.84)</td>
<td>50.86 (26.48)</td>
<td>20.86 (18.57)</td>
<td>50.68 (17.59)</td>
<td>46.66 (13.93)</td>
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<tr>
<td>Group member 1:</td>
<td>Maria; Group member 2: Susan; Group member 3: Linda.</td>
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<td>Symmetric</td>
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<td>Influence</td>
<td>Friendship</td>
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<td>1. Status: Group member 1</td>
<td>59.92 (28.95)</td>
<td>84.81 (11.68)</td>
<td>53.55 (31.43)</td>
<td>82.47 (15.44)</td>
<td>57.58 (18.22)</td>
<td>60.85 (15.48)</td>
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<td>2. Status: Group member 2</td>
<td>57.61 (9.81)</td>
<td>37.00 (16.94)</td>
<td>60.03 (28.96)</td>
<td>30.26 (22.22)</td>
<td>67.16 (14.22)</td>
<td>64.96 (16.70)</td>
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<td>3. Status: Group member 3</td>
<td>52.10 (30.75)</td>
<td>58.11 (17.65)</td>
<td>59.91 (14.51)</td>
<td>60.49 (12.24)</td>
<td>45.95 (18.43)</td>
<td>45.74 (16.68)</td>
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<tr>
<td>Group member 1:</td>
<td>Morgan; Group member 2: Jesse/Casey; Group member 3: Pat.</td>
<td></td>
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</table>
The perception of status

p < 0.05; MD = −8.30; SD = 4.26) than in the symmetric. While Jesse, the most central group member, was still ranked the highest of all the group members, the difference between Jesse and Pat was only 0.12.

These results indicate that the effects of the direction and type of relationship may be most pronounced for clearly female and clearly male names. We then became curious whether the participants were viewing the three gender neutral names as truly neutral or instead as neither male nor female, or potentially were associating one of these names with the male or female gender. In other words, to what extent was there some error in the designation of the names as “gender neutral”? We used the Genderize API (https://genderize.io) to investigate the association of the names used in the neutral condition with either masculinity or femininity. While Morgan and Pat were relatively gender neutral (Morgan was 64% female based on a comparison of 847 similar names; Pat was approximately 60% female [1242 names]), Jesse was perceived as clearly female (93%; 1,095 names). It is therefore possible that these results instead reflect that people vary in how they allocate status to members of a mixed-gender group compared to single-gender groups. Furthermore, the difference in status of the middle group member reflects differences in how status is allocated to men and women, respectively, as the man is ranked higher than the woman even when the woman occupies a “higher” position in the linear-ordered chain.

To test this probability, we recollected the neutral conditions (n = 160) with Casey (56% female; 778 names) as a replacement name for Jesse. A repeated measures ANOVA revealed a significant main effect of direction (F(1,159) = 3.60; p < 0.05; \( \eta^2 = 0.05 \)). Neither gender (F(1,159) = 1.78; p = 0.18) nor the interaction between gender and direction (F < 1) had a significant effect on the ranking of the group members. In other words, participants did not rank the group members in the neutral condition (Morgan: Mean = 56.63; SD = 20.41; Casey: Mean = 62.46; SD = 14.79; Pat: Mean = 51.51; SD = 21.66) differently from the female condition (Morgan: Mean = 60.58; SD = 18.74; Casey: Mean = 66.04; SD = 17.01; Pat: Mean = 49.44; SD = 19.08).

Discussion. We interpret these results as indicating that participants’ status judgments of the evaluated person do not necessarily vary with that target’s gender. The direction and type of tie influence the status ranking of others when the group members’ names are male, female, or gender-neutral. As expected, when the group is mixed gender, the status associations that people have with gender impact their judgments of other’s status.

3.9 General discussion

This paper explored how people inferred the social status of the members of a hypothetical group from their relationships to each other. Given that most scholars implicitly assume that people do infer status from social relationships (e.g., Podolny, 2001), the main finding of this paper may not be surprising. However, this paper tests experimentally and systematically—possibly for the first time—the relationship between network and status perceptions. We theorized that the direction and type of social relationship trigger different types of network schemas, and that these
variations in the consequent mental representation of the network influence the resultant status judgment. Study 1 revealed that the direction and type of social relationship independently and jointly influenced an individual’s status judgments of others. As a result, a group member’s position in a status hierarchy depended on whether she was embedded within symmetrical, friendship relations, or whether she was enmeshed in a web of asymmetrical, influence relations. Studies 2, 3a, 3b, and 4 addressed several limitations of Study 1, yet found a similar pattern of results. Together, these studies make the following contributions to research on status and network cognition.

First, we show—and to the best of our knowledge, for the first time—that judgments of others’ status vary with the type and direction of the observed social relationship. Our results demonstrate that status judgments do not converge across the relational types (neutral, advice, influence, friendship, and crossed) tested in this paper. This finding is an important extension of prior research which often has emphasized that judgments of others’ status are often sensitive to their social context (Anderson et al., 2015; Berger et al., 1972; Blau, 1964). This paper provides evidence that differences in a person’s social context, as represented by variance in the direction and type of social interaction, influences how people recognize and perceive the pattern of interpersonal relationships that exists within a given group, and lead to important differences in how others’ status is inferred from their network ties.

Second, our results suggest that status beliefs generated from relationships form even in the absence of directly observed behavior. Prior research on the discernment of status has involved the manipulation of direct behavioral cues such as the dominance or submissiveness of one member to another (Ridgeway & Erickson, 2000). Behaviors such as gaze aversion (Terburg et al., 2012), and emotional expressions (Keltner et al., 2003) such as pride (Cheng et al., 2013), reveal to observers which member of a focal dyad outranks the other in the social hierarchy. In contrast to this work, our experiments manipulated only symbolic representations of relationships. The fact that the mere observation of who is linked to whom can lead to the construction of status hierarchies might help to explain why status hierarchies are so ubiquitous in human interactions.

Third, our findings might also help to explain the existence of status multiplicity (Kovács & Liu, 2016). Status multiplicity refers to whether the perceived status of an actor, object, or organization varies across audiences; for example, James could be high-status among his friends but low-status at his workplace. The results presented in this paper would suggest that one cause of status multiplicity might be that different observers perceive either a different set or different types of ties for the focal actor, and consequently, ascribe different levels of status to the focal actor. For instance, continuing with the above example, it might be that James’ professional colleagues are unaware of James’ friendship tie to a high-status person, whereas his friends are aware of this tie. Therefore, the status level ascribed to James by his friends would be higher than that ascribed by his professional colleagues. While it is relatively well-established that there are numerous benefits associated with high-status positions, we know relatively less about how status multiplicity affects these benefits. Our findings and experimental design could facilitate the exploration of whether it matters if a person is high-status in one social domain but low-status in another.
Limitations and directions for future research. There are some limitations to this paper’s designs and analyses. We review these limitations and discuss how addressing them might inspire avenues for future research. One limitation is that the experiments were conducted online. While the fact that we demonstrated the existence of relationship-based status inferences in an online setting speaks to the robustness of the underlying phenomenon, relationships might work differently as status cues in an offline setting. Future research could expand our results to richer stimuli, such as by priming experimental participants with photos and/or videos of social settings in which people talk to each other, give advice to each other, stand closer to/farther from each other, etc. Future research also could include additional ascribed and achieved status characteristics (such as wealth, clothing, or education) to the experimental design, and explore how these interact with observers’ tie-based status inferences. Moreover, our experiments, as is true of most lab experiments, are conducted in a “vacuum”—abstract from most complexities of social life. For example, we did not explore how the meaning of tie reciprocity and tie type might vary by context. Such questions should be explored in future research and possibly with other research designs. Research also could investigate more applied instantiations of status and hierarchies, such as leadership perceptions (Carnabuci et al., 2018).

We focused on the individual-level of analysis. Future research that explores different types of stimuli could examine whether and the extent to which observers’ status judgments of more complex social units, such as groups or organizations, also vary with the type and direction of social relationships. For instance, at the organizational-level, cooperation between firms and leadership of cooperative syndicates often are used to infer a company’s status position (Podolny, 2005); yet, these corporate actors are often linked to one another competitively or via dominance relations, in which one organization strives to achieve a greater market position than the other. Given the relative advantages of high-status positions, it would be intriguing to explore the ramifications of status multiplicity stemming from observers’ interpretations of the different types of relations that connect firms to one another.

Another limitation of our design is that the network structures that participants learned are relatively simple. While this choice did facilitate our ability to determine whether a link exists between the mental representation of a network and the translation of this information into a status judgment because it reduced the information processing costs related to the network itself, future research also could examine larger or more complex network structures. This would allow for the investigation of whether observers’ relational status inferences influence their perception of more complex network phenomena, such as brokerage and closure. For instance, future research could contrast the status and performance benefits of brokerage positions, this may provide a means of testing the “pipes” versus “prisms” dichotomy in network research (Podolny, 2001). Alternatively, it also would be intriguing to explore whether brokers whose relational position translates to a relatively high-status position also are trusted more by other group or organizational members.

Cross-cultural variation in the above processes could also constitute interesting avenues for future research. In the current paper, we restricted our participant
recruitment to native English-speaking participants. Yet, research shows that the role networks, hierarchies, and status play in societies vary significantly across cultures (see Hofstede, 2003). Future research should investigate the generalizability of our findings to other, non-Anglo-Saxon cultures.

Last, future research could explore the relative weights granted to the different relational schemas that the participants used to make sense of the groups’ network structure. On the one hand, it is possible that these heuristics represent different points on a continuum of mental representations. If this is the case, then people may be able to move from one schema to another with relative ease. On the other hand, the schemas could represent discrete types of cognition, which would imply that the relative effort needed to deploy one heuristic could be far greater than for another. While the current studies lack the granular processing-time measures needed to explore this issue, future research could examine whether one relational schema is more powerful than the other when it comes to the ranking of the group members.

In conclusion, across five studies, we have shown that external observers do infer the status positions of focal group members from their social connections, and that these status judgments are influenced by differences in the type and the direction of a relationship.

Acknowledgments

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Supplementary materials

For supplementary material for this article, please visit https://doi.org/10.1017/nws.2018.13

References


The perception of status


