

# Distributed decision-making in the shadow of hierarchy: How hierarchical similarity biases idea evaluation

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## Abstract

**Research Summary:** Companies are increasingly opening up decision-making, involving employees on all levels in distributed—and purportedly “hierarchy-free”—decision processes. We examine how hierarchy reaches into such “democratized” systems, arguing that it is a source of homophily that biases idea evaluation decisions. Using a data set from internal crowdfunding at one of the world’s largest industrial manufacturers, we show that idea evaluators overvalue hierarchically similar others’ ideas. Competition in the form of lateral closeness dampens this bias, whereas uncertainty in the form of novelty amplifies this bias. We contribute to the literatures on decision biases in centralized versus distributed innovation and on structural similarity as a driver of employee behaviors.

**Managerial Summary:** Many companies are starting to involve employees on all levels in strategic decisions, so as to curb hierarchical rigidities and integrate multiple perspectives. However, such distributed decision-making opens the door to new biases and, ultimately, suboptimal strategic decisions. In the context of internal crowdfunding at a large industrial manufacturer, we

All the authors contributed equally and are presented in random order.

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show that employees evaluate hierarchically similar others' ideas overly favorably. Thus, hierarchy is not just a source of rivalry, but also of identification, leading to favoritism among hierarchical peers. Further, employees are particularly likely to assess ideas based on hierarchical similarity rather than content if the ideas are novel and therefore hard to evaluate. We provide suggestions for the design of distributed decision-making systems.

#### KEYWORDS

bias, distributed decision-making, hierarchy, idea selection, internal crowdfunding

## 1 | INTRODUCTION

Traditionally, the evaluation and selection of ideas—deciding which will be implemented and which will be abandoned—was the province of upper management (Colombo, Foss, Lyngsie, & Rossi Lamastra, 2021; Keum & See, 2017). In recent years, companies have begun to open up decision-making, involving employees throughout the company in more distributed decision processes (Bernstein, Bunch, Canner, & Lee, 2016; Reitzig & Sorenson, 2013).

Distributed decision-making holds several benefits, such as the division of work (Raveendran, Puranam, & Warglien, 2021), the integration of many stakeholders' perspectives (Weiser, Jarzabkowski, & Laamanen, 2020), and the reduction of idea evaluation biases that are known to exist in centralized, hierarchical organizational forms (Fuchs, Sting, Schlickel, & Alexy, 2019). However, this “democratization” of decision-making may open the door to new biases, particularly as decision-making accountability is diffused to many employees. For instance, research has shown that employees favor ideas from their business unit (Reitzig & Sorenson, 2013), discount others' ideas that are thematically close to their work (Boudreau, Guinan, Lakhani, & Riedl, 2016), overvalue their own ideas (Keum & See, 2017), and may undervalue colleagues' ideas owing to turf wars and competition for resources (Criscuolo, Dahlander, Grohsjean, & Salter, 2017).

This article tackles a crucial and hitherto overlooked aspect of distributed decision-making: its hierarchical multidirectionality. Besides downward evaluations, distributed decision-making newly allows for upward and peer evaluations. Thus, hierarchical (dis)similarity between idea creators and evaluators is a central new aspect of decentralized decision-making. This is somewhat ironic, given that the idea of leveling the hierarchical high ground into a hierarchy-free, egalitarian sphere is purportedly at the heart of distributed decision-making (Klapper & Reitzig, 2018; Reitzig & Sorenson, 2013).

We start from the premise that the hierarchical position provides specific cues about an ideator, which may distort evaluators' decisions. We investigate *whether* and *how* hierarchical similarity between ideators and evaluators biases idea selection in decentralized decision-making. We also examine the root of this hierarchical similarity bias, suggesting that it is driven by a form of homophily (e.g., Lazarsfeld & Merton, 1954; McPherson, Smith-Lovin, & Cook, 2001). Individuals on a similar hierarchical level face similar challenges regarding the nature of their tasks, sources of expectations and pressure, career aspirations, and so forth, and are therefore more likely and better able to empathize with one another, which may lead to favoritism. We

predict that competition in the form of lateral closeness dampens this bias, whereas uncertainty in the form of novelty amplifies this bias.

To test these ideas, we use a unique data set from an internal crowdfunding initiative at Alpha (a pseudonym), one of the world's largest industrial manufacturers. From 2015 to 2020, Alpha asked employees to participate in six funding rounds on its internal crowdfunding platform. Our data stem from its second crowdfunding initiative, which took place in March 2016. Employees from the corporate R&D department (ideators) submitted 77 ideas, which 264 employees throughout the organization (evaluators) then evaluated. Each evaluator could allocate a budget of up to €3,160, and funders remained anonymous throughout. This yielded 20,405 evaluation decision dyads. To control for underlying objective idea quality, we used idea-level fixed effects designs.

We find that idea evaluations are distorted by the degree of hierarchical similarity between the ideator and the evaluator: evaluators prefer ideas from ideators who are hierarchically similar to them, as long as they are not so close as to be rivals. We also find this bias to be more pronounced for more novel ideas: novel ideas involve more uncertainty, leading evaluators to rely more strongly on social cues such as hierarchical position. Extensive robustness checks as well as 22 post hoc interviews with evaluators support these interpretations, showing evidence for a structural (rather than an informational or a relational) pathway. For instance, we show that the hierarchical similarity bias vanishes if the evaluator is blind to the ideator's identity and position. We added an experiment to confirm our results and the indirect effect of hierarchical similarity on idea selection through hierarchy-based homophily.

Our paper is part of the emerging discourse about idea evaluation biases in organizations, which examines and compares biases in centralized (Criscuolo et al., 2017; Hegde & Tumlinson, 2014; Keum & See, 2017) and distributed organizational types (Greenberg & Mollick, 2017; Hwang, Singh, & Argote, 2015; Reitzig & Sorenson, 2013). We contribute to this discussion first by showing that distributed idea evaluation systems, whose principal advantage purportedly derives from the absence of hierarchy, are in fact influenced by hierarchical position. Second, we contribute by disentangling *how* and *why* hierarchical similarity affects distributed idea evaluation. We propose hierarchy-based homophily as the mechanism by which evaluators overvalue the ideas of hierarchically similar others. Hierarchy-based homophily reinforces the theoretical underpinning of the notion that hierarchy is not only a source of authority, but also of identification (Horton, McClelland, & Griffin, 2014). We highlight that this mechanism's prominence depends on an idea's novelty, since uncertainty renders the evaluation's social context more salient.

Our paper also contributes to the literature on structural similarity as a driver of employee behaviors. Prior research offers conflicting results about the effect of employees' structural similarity on evaluation outcomes (positive: Hwang et al., 2015; Reitzig & Sorenson, 2013; negative: Kilduff, Elfenbein, & Staw, 2010; Piezunka, Lee, Haynes, & Bothner, 2018a). Our results contribute to an understanding of how structural similarity along several dimensions of organizational structure biases decision-making, thereby reconciling contradicting results from the literature.

## 2 | BACKGROUND

### 2.1 | Centralized versus distributed idea evaluation in organizations

Decision-making in organizations is typically centralized, that is, a few individuals have authority over core organizational resources. Individuals high in a firm's hierarchy tend to have more

power over valuable resources than those lower in the hierarchy (Magee & Galinsky, 2008). Accordingly, idea evaluation is usually top-down, such that a few individuals at the top of the hierarchy select ideas and intrapreneurial initiatives for implementation (Barney, Foss, & Lyngsie, 2018).

The widespread adoption of digital technologies has enabled changes in the organization of decision-making (Yoo, Boland, Lyytinen, & Majchrzak, 2012), allowing for new forms of distributed, decentralized, or democratized decision-making. In distributed decision-making, authority over innovation decisions (such as idea evaluation) shifts from top managers to employees throughout the organization (Colombo et al., 2021), effectively enabling new participatory approaches to company strategy and innovation (Jarzabkowski, Lê, & Balogun, 2019).

These approaches promise to overcome authority's dampening effect on subordinates' motivation (Fehr, Herz, & Wilkening, 2013; Klapper & Reitzig, 2018) and tap into knowledge distributed throughout an organization (Colombo et al., 2021). At the same time, they may introduce new sources of inefficiency, which must be better understood so as to choose the best organizational decision-making type in a given situation. Recent research has begun to dissect decision biases that are newly created by distributed evaluation configurations (Colombo et al., 2021; Keum & See, 2017; Reitzig & Sorenson, 2013).

We consider the newly created opportunity for upward and peer evaluation, along with downward evaluation, in distributed decision-making. Hierarchy is ubiquitous in organizations and therefore likely reaches into distributed, purportedly hierarchy-free decision systems, potentially distorting their functioning.

## 2.2 | Biases in idea evaluation

Ideas that are novel to an organization differ from established ideas (Berg, 2016) and are associated with uncertainty (Mueller, Melwani, & Goncalo, 2012). Since existing evaluation standards may not accommodate the novelty and uncertainty inherent in new ideas, evaluators may look for additional information to guide their assessments and to incorporate cues above and beyond idea quality into their judgments, thereby introducing potential bias (Mueller, Melwani, Loewenstein, & Deal, 2018). The literature has distinguished between biasing cues rooted in an idea (e.g., Criscuolo et al., 2017), an ideator (e.g., Fuchs et al., 2019), an evaluator (e.g., Berg, 2016), a social context (e.g., Mueller et al., 2018), and an ideator–evaluator relationship (e.g., Reitzig & Sorenson, 2013).

Our work falls into the last group of papers, which show that evaluators may implicitly consider their relationship to the ideator when evaluating ideas. For instance, evaluators deem ideas to be more valuable if they have a shared social identity with the creators, that is, if they belong to the same group, particularly if that group is a minority (Greenberg & Mollick, 2017). Venture capitalists are more likely to select startups if they share ethnicity (Hegde & Tumlinson, 2014), experience (Franke, Gruber, Harhoff, & Henkel, 2006), and/or social ties with their team members. Scientists evaluate new proposals as worse if the proposal creator is closer to their own scientific field (Boudreau et al., 2016).

With some seminal exceptions, very few studies on idea evaluation have investigated biases rooted in attributes of organizational structure or, rather, individuals' perceptions thereof. Keum and See (2017) found that organizational structures with strong hierarchy of authority are detrimental to idea generation, but that hierarchy is beneficial during idea evaluation. Reitzig and Sorenson (2013), investigating how lateral (horizontal) closeness distorts idea



evaluation, found that employees prefer ideas from their own business unit; this in-group bias is less intense if the ideator comes from either larger subunits (larger units are associated with more distant evaluator-ideator relationships) or more R&D-intensive ones (associated with higher idea creator status).

Embracing this finding, our study considers interactions between multiple attributes of organizational structure, including lateral closeness and newly introducing vertical ideator-evaluator relationships, which are ubiquitous in organizations. Hierarchical proximity has been shown to shape behaviors in reciprocal settings such as coworkers' knowledge exchanges (Hwang et al., 2015), but has not been associated with relational biases. We study how similarity along this dimension, singly and in combination with other dimensions of structural similarity, biases decision-making, arguing that a bias's shape depends on the overall perceived degree of similarity.

### 3 | HYPOTHESIS DEVELOPMENT

We will now argue how an evaluator's hierarchical position relative to an ideator influences an evaluation decision; specifically, we hypothesize that their hierarchical similarity creates a bias rooted in *hierarchy-based homophily*. We further hypothesize that lateral closeness, as studied by Reitzig and Sorenson (2013), counteracts this bias, since it reinforces rivalry in the creator-evaluator dyad. We also hypothesize that the hierarchy-based homophily bias is amplified by idea novelty. Our arguments are structural—based solely on relative position in the organization structure.

#### 3.1 | Hierarchy-based homophily in idea evaluation

*Homophily* describes the phenomenon of individuals favoring similar over dissimilar others (McPherson & Smith-Lovin, 1987). Homophily is a ubiquitous phenomenon, since it can be based on a wide range of attributes, including ascribed attributes such as gender, ethnicity, and age (Lazarsfeld & Merton, 1954; McPherson et al., 2001), but also achieved attributes such as preferences, education, or occupation (Ertug, Brennecke, Kovács, & Zou, 2022). It is rooted in in-group favoritism (Tajfel, 1982; Tajfel & Turner, 1986): shared group membership stimulates mutual understanding and identification with the other person, which leads to favorable treatment (Brewer, 1979; Mullen, Brown, & Smith, 1992).

Homophily shapes individuals' behaviors and their evaluation of others, both on achieved and ascribed characteristics (Ertug et al., 2022). In organizations, homophily influences knowledge-sharing (Hwang et al., 2015), communication (Kleinbaum, Stuart, & Tushman, 2013), and tie formation (Mollica, Gray, & Treviño, 2003). Outside organizations, it has been shown to affect the evaluation of ideas (Greenberg & Mollick, 2017) and ventures (Franke et al., 2006; Hegde & Tumlinson, 2014).

In our view, organizational hierarchy can be a source of homophily in organizations (cf. Doyle, Lount, Wilk, & Pettit, 2016; Hwang et al., 2015), leading to preferential idea evaluation based on hierarchical similarity. Such similarity provides a basis for identification within a group (i.e., with all others on the same level) and differentiation to an out-group of hierarchically distant others. Mere membership in the same group has been shown to relate to homophilic preference, since it shapes the extent to which individuals feel that they share the same

fate (Mael & Tetrick, 1992). This is also true for individuals on the same hierarchy level, since identities may be rooted in hierarchies (Sluss & Ashforth, 2007).

Specifically, employees likely feel that they share the same fate as other employees, and the same is true among middle and top managers, respectively (Corley, 2004). Individuals on the same hierarchical level face similar challenges and problems concerning for instance the nature and visibility of their tasks, sources of pressure within the organization, career aspirations and pathways, conflict with superiors, and leadership of subordinates. Thus, individuals on a similar hierarchical level are more likely and better able to put themselves in one another's shoes and to empathize with one another. In turn, perspective-taking fosters liking (Davis, 2018). With decreasing hierarchical similarity, homophilic preferences will likely decrease, as mutual identification and shared problems decline. Instead, negative emotions such as envy or contempt arise as organizational hierarchies structure individuals into inferiors (who are scorned) and superiors (who are envied) (Fiske, 2010).

Owing to hierarchy-based homophily, we expect individuals to prefer ideas from hierarchical peers. Homophily between individuals is associated with liking (Byrne, 1961), affect (Glaman, Jones, & Rozelle, 1996), and the accentuation of the other's positive attributes (Pearce & Xu, 2012). Homophily also establishes common ground and trust between individuals (Ruef, Aldrich, & Carter, 2003). Homophily based feelings of liking and trust extend from the person to the information they provide; they decrease uncertainty in communication and increase the provided information's credibility (Hwang et al., 2015). That is, the greater the hierarchical similarity between individuals is, the more the provided information (and ideas) will be perceived as credible and positive. This logic is supported by evidence from venture capitalists' funding decisions (Franke et al., 2006) and crowdfunding (Greenberg & Mollick, 2017), which showed that homophily produces a preferential treatment of similar others in these contexts. In sum, our expectation is a positive hierarchy-based bias in idea evaluation—evaluators favor ideas of ideators who are hierarchically close to them:

**Hypothesis H1.** *The greater the hierarchical similarity between an ideator and an evaluator, the more favorable the idea evaluation will be.*

### 3.2 | Lateral closeness and hierarchical similarity bias

We suggest that the degree of lateral closeness—the horizontal dimension of the organizational structure (Reitzig & Sorenson, 2013)—moderates the relationship between hierarchical similarity and idea evaluation. Specifically, we argue that hierarchical similarity bias will be less pronounced for laterally proximate evaluation dyads.

When ideators are laterally distant, increasing hierarchical similarity will be associated with hierarchy-based homophily, as laid out in H1. Evaluators are unlikely to feel a competitive threat concerning their career goals, resources, or management attention from individuals who are laterally distant, even if they are on a similar hierarchical level. In such conditions, the homophily mechanism is likely to flourish, since employees want to help others in a similar hierarchical situation (cf. Greenberg & Mollick, 2017).

In contrast, if ideators are laterally close to evaluators, growing hierarchical similarity is likely to be associated with less favorable evaluations, since hierarchical similarity combined with lateral closeness engenders competition and rivalry. Research has shown that competition and rivalry become more pronounced when actors are more rather than less similar (Kilduff





et al., 2010; Tesser, Millar, & Moore, 1988). In turn, rivalry among similar ranks may induce adverse behaviors (Gould, 2003), since individuals increase their competitive behaviors to outperform a rival (Garcia, Tor, & Gonzalez, 2006). Competition is more likely to yield conflict under status similarity (Piezunka, Lee, Haynes, & Bothner, 2018b).

In our setting, individuals who are both hierarchically and laterally close are likely in a competitive situation with opposed goals (Deutsch, 1949; Kilduff, 2019, p. 776). They compete for scarce resources such as budgets, promotions, and management attention, where the one's gain comes at the loss of the other. In this case, evaluators are likely to be more hesitant to support the ideas of those in a similar hierarchical position. In sum, we propose that lateral proximity attenuates the positive effect of hierarchical similarity on idea evaluation as perceived rivalry intensifies:

**Hypothesis H2.** *Lateral proximity dampens the overvaluation of ideas by hierarchically similar others.*

### 3.3 | Idea novelty and hierarchical similarity bias

We will now investigate how the characteristics of an idea under evaluation shape hierarchical similarity bias. Specifically, we suggest that the degree of idea novelty affects the relationship between hierarchical similarity and idea evaluation, such that the hierarchical similarity bias will be more pronounced for more novel ideas.

Since novel ideas differ more from existing solutions than more conventional ideas, their value is harder to assess. Judging novel ideas requires new frames of reference, creating uncertainties that make idea evaluation particularly prone to biases (Criscuolo et al., 2017; Tversky & Kahneman, 1974): For novel ideas, the share of cognitive processing that relies on the social context rather than the idea itself is higher; evaluators tend to appraise ideas based on their social context, relying on their understanding of the source (Menon & Blount, 2003). Hierarchical similarity is a readily available cue that evaluators will consider in lieu of the quality of highly novel ideas.

In contrast, when evaluating less novel ideas, evaluators find it easier to rely on rational evaluation, that is, to evaluate an idea rather than its creator, since they are familiar with such ideas and can draw on existing knowledge schemas and frames of reference (Meyers-Levy & Tybout, 1989). Thus, evaluators are less likely to consider ideator cues such as hierarchical similarity. We therefore propose:

**Hypothesis H3.** *Idea novelty amplifies the overvaluation of ideas by hierarchically similar others.*

## 4 | EMPIRICAL STRATEGY

### 4.1 | Research context

Our data came from an internal crowdfunding initiative at a large European technology company focused on industry, infrastructure, transport, and healthcare (dubbed Alpha) between February 1 and March 7, 2016. We chose this context because it satisfied our sampling criteria:

ideators and evaluators must be embedded in the same hierarchically structured organization, and there must be the possibility of downward, upward, and peer evaluations.

The crowdfunding initiative comprised an ideation phase and an evaluation phase. The ideation phase lasted 5 weeks, during which employees from the corporate research department could submit one or more project ideas to an internal online platform. The minimum requirements for a project proposal included the targeted funding sum, descriptions of the deliverables, tasks, and milestones, and the ideator's name and department. Further, ideators could upload pictures, videos, and other information as well as a portrait photograph of themselves. There was no restriction on the project topics, and no pre-upload vetting of ideas. The idea suggestions could be viewed but not evaluated during the ideation phase. Then, 77 ideators submitted 77 project proposals.

The evaluation phase followed immediately after the ideation phase. Of approximately 470 employees who had signed up to become evaluators, 264 actually invested in the project proposals. Each evaluator received a budget of €3,160, which could be allocated among the 77 ideas in €1 increments. Investments could not be revoked. The evaluators remained anonymous throughout and after the contest.

## 4.2 | Measurement

### 4.2.1 | Dependent variable

Our main dependent variable is *Idea selection*, which captures whether or not an evaluator invested any money into a given idea. In alternative model specifications, we checked whether our findings held when we used the share of requested funding awarded (*Fraction funded*) and the total amount that an evaluator has allocated to a given idea (*Funding amount*) as dependent variables.

### 4.2.2 | Independent and moderator variables

To measure perceived *Hierarchical similarity*, we used the number of hierarchical levels between a given ideator and a given evaluator as a proxy (Hill, Seo, Kang, & Taylor, 2012). To do so, we exploited the organizational code displayed next to the ideator's name on the crowdfunding platform, which indicated the number of levels between the ideator and the CEO. We verified all the codes in the sample by comparing them to the organizational charts.

Hierarchical similarity captures the inverse of the absolute difference between number of levels to the CEO between an ideator and an evaluator (absolute difference  $\times (-1)$ ); this variable ranges from  $-7$  (most dissimilar) to  $0$  (most similar, i.e., same hierarchical level).

The first moderator we used was *Lateral closeness*, that is, the horizontal proximity between any given creator-evaluator pair. We measured this proximity as Reitzig and Sorenson (2013) did. From smaller to larger units, the organization was structured into departments, business units, and divisions. We coded creator-evaluator pairs as laterally close if they were in the same business unit, or closer and as laterally distant if they were in the same division or more distant.

For our second moderator, we measure *idea novelty* with the content distance between the proposed idea and previous innovation projects at Alpha. To calculate content distance, we use





the textual description of each idea and compare it to the descriptions of 12,000 projects that had been implemented by the organization in the previous 4 years. To this end, we first stem the word descriptions of all ideas using the *quanteda* R package. We also convert all words into lowercase and remove punctuation, numbers, blank spaces, and stop-words that add little information owing to their common occurrence in English. Then, in a “bag of words” approach, we transform textual descriptions into word vectors. We calculate the cosine similarity between each of the 77 vectors (each representing one of the ideas) and the vector representing all projects from the project database. To ensure a greater weight of unique words in a certain idea and a lower weight of words that were common across all ideas, we employ a weighting strategy that emphasizes unique words (for the process we follow, see Piezunka & Dahlander, 2015). To calculate our novelty measure based on content distance, the obtained cosine similarity is deducted from 1. This measure's face validity was corroborated in conversations with company managers.

### 4.2.3 | Control variables

To assess hierarchical similarity's effect on idea selection, one must control for idea quality and presentation. We do so by fixing unobserved variance at the idea level. Thus, the number of ideas drops to 58, since ideas can only be considered if some but not all or none of the evaluators funded them. (We reran all analyses using a random-effects specification with all 77 ideas; our findings remain fully intact.)

We also control for the potential effect of existing personal relationships between ideator and evaluator. To this end, we use four variables: First, we control for *Lateral closeness* (our moderator variable), a proxy for the existence of personal ties—thereby accounting for the fact that lateral closeness can bias idea evaluation (Reitzig & Sorenson, 2013). Second, we use the number of messages an evaluator and a creator sent each other via the platform before the evaluation phase started (*Communicational intensity*). Third, we control for the *Geographical distance* (in km) between the office locations of the evaluator and the ideator.<sup>1</sup> Fourth, we control whether the ideator and the evaluator were located in the *Same country*.

Besides personal relationships, we also consider evaluator-creator reciprocity as a mechanism that could potentially obfuscate our findings. To this end, we control for the number of likes that individuals gave one another on ideas and comments during the ideation phase (*Mutual likes*).

We also control for other variables, such as gender (*gender similarity*) (1 if yes, and 0 otherwise), the *Evaluator's hierarchical position* (steps to the CEO), and whether or not an idea was tagged by the ideator as relevant to the evaluator's division (*Idea relevance to the evaluator's division*). Further, we control for potential herding behavior by including the *Share funded* and the *Share funded squared*, a variable that measures the funding that an idea had received in relation to its target budget at the time of the focal investment.

Table 1 lists the variables, while the descriptive statistics can be found in Table 2. Our findings are summarized in Table 3.

<sup>1</sup>We used R's *geosphere* package (Hijmans, Williams, & Vennes, 2019) and its function *distVincentySphere* (Vincenty, 1975).

### 4.3 | Selection treatment

Participation in the crowdfunding contest was not random, because evaluators self-selected to participate in idea evaluation. To mitigate against potential selection effects, we introduced a correction factor (Mills ratio).

Notably, the system was closed once €530,000 had been spent on fully funded ideas. Evaluators who had not yet spent their personal budgets at that time would be unable to do so. Interestingly, the overall budget was spent after 6 hr of evaluation time,<sup>2</sup> giving only 56% of the registered evaluators time to be involved. We assumed that, concerning their motivation to participate, the employees who had signed up but did not participate (i.e., would-be evaluators) were more similar to those who did not sign up (i.e., the rest of the Alpha population) than to those who had signed up and participated (i.e., the evaluators). We argue that, because the selection between would-be evaluators and evaluators does not bias our results, the selection between the Alpha population and the evaluators is also likely to be unbiased.

To check for a selection effect between the would-be evaluators and the evaluators, we used a Heckman selection model (Heckman, 1976) and calculate the inverse Mills ratio of all 470 employees who had registered. We use the time zone in which an individual was located as an exclusion restriction. As the evaluation phase started at 11:30 a.m. UTC + 1 (Central European Time), being far from this time zone would affect the decision to participate, but not the spending behavior. We use a probit regression to predict the likelihood of participation (coefficient =  $-0.310$ ,  $p = .000$ ; model: log likelihood =  $-24,845.144$ ,  $p = .000$ ) and calculate the inverse Mills ratio based on these results. We include the Mills ratio in our regressions to mitigate selection effects. Our findings remain materially unchanged compared to when we do not include the inverse Mills ratio.

## 5 | FINDINGS

### 5.1 | H1: Hierarchical similarity

Our expectation from H1 is for hierarchical similarity's effect to be positive. In support of H1 (see Model 1 in Table 3), we find that *Hierarchical similarity* has a positive effect on *Idea selection* ( $b = 0.279$ ,  $p = .000$ ). The odds ratio for *Hierarchical similarity* is 1.322 ( $e^{0.279} = 1.322$ ), that is, the likelihood of funding an idea increases by about 32% with each hierarchical similarity step.

Moving to the control variables, the *Share funded* affects evaluation decisions nonlinearly, likely owing to evaluators being unable to provide additional funding once an idea had been fully funded. The effects of *Gender similarity*, the *Evaluator's hierarchical position*, and the *Idea relevance to the evaluator's division* are not substantially related to the *Idea selection*.

Perhaps more interestingly, we control for several variables that account for the potential effect of personal relationships: organizational proximity (measured as *Lateral closeness*), geographical proximity (measured as *Geographical distance*), *Same country*, and the extent of prior communication on the crowdfunding platform. All these variables are related to the amount of funding received. Like Reitzig and Sorenson (2013), we find that *Lateral closeness* in the organization positively affects *Idea selection*. Further, ideators are more likely to receive funding from

<sup>2</sup>The evaluators had time to familiarize themselves with the ideas in the previous weeks.

TABLE 1 Descriptions of the variables

Variable name	Explanation	Level	Data source
Idea selection	Dummy = 1 if the evaluator has invested in a given idea	Dyad	Crowdfunding platform
Fraction funded	The share of the requested funding awarded by the evaluator in relation to the total funding requested	Dyad	Crowdfunding platform
Funding amount	The total amount an evaluator allocated to a given idea	Dyad	Crowdfunding platform
Hierarchical similarity	Inverse of the absolute difference between the creator's number of levels to the CEO and the evaluator's (absolute (difference) $\times (-1)$ )	Dyad	Crowdfunding platform + company directory
Downward hierarchical similarity	Same as hierarchical similarity, but = 0 if the ideator was hierarchically above the evaluator	Dyad	Crowdfunding platform + company directory
Upward hierarchical similarity	Same as hierarchical similarity, but = 0 if the ideator was hierarchically below the evaluator	Dyad	Crowdfunding platform + company directory
Lateral closeness	The evaluator and the ideator are from: 1 = the same business unit or closer 0 = the same division or more distant	Dyad	Company directory
Idea novelty	The content distance between the proposed idea and prior innovation projects at alpha, calculated employing cosine similarity $-1$	Idea	Crowdfunding platform + company project database
Communication intensity	The number of messages the evaluator and the ideator exchanged before the evaluation phase started	Dyad	Crowdfunding platform
Geographical distance	Distance (in km) between the office locations of the evaluator and the ideator	Dyad	Crowdfunding platform + company directory
Same country	Dummy = 1 if the evaluator and the ideator were from the same country	Dyad	Company directory
Mutual likes	The number of likes that the ideator and the evaluator gave each other during the idea creation phase	Dyad	Crowdfunding platform
Gender similarity	Dummy = 1 if the evaluator and the creator have the same gender	Dyad	Company directory
Evaluator's hierarchical position	The evaluator's number of steps to the CEO	Evaluator	Crowdfunding platform + company directory
Idea relevance for evaluator's division	Dummy = 1 if the ideator indicated that an idea is relevant to the evaluator's unit, and 0 otherwise	Dyad	Crowdfunding platform
Share funded	Share of the target funding reached at the time of the evaluation	Dyad	Crowdfunding platform

TABLE 2 Descriptive statistics

Variable	Obs	Mean	SD	Min	Max	1	2	3	4	5
1 Idea selection	20,328	0.027	0.163	0.000	1.000	1.000				
2 Funding amount	20,328	39,682	293,051	0.000	3,160,000	0.812	1.000			
3 Hierarchical similarity	20,328	-1.520	1.502	-7.000	0.000	0.068	0.073	1.000		
4 Hierarchical similarity upward	20,328	-0.728	1.295	-5.000	0.000	0.049	0.050	0.566	1.000	
5 Hierarchical similarity downward	20,328	-0.792	1.316	-7.000	0.000	0.029	0.034	0.584	-0.338	1.000
6 Lateral closeness	20,328	0.243	0.429	0.000	1.000	0.113	0.110	0.428	0.227	0.265
7 Idea novelty	77	0.845	0.031	0.765	0.923	-0.032	-0.036	-0.042	0.028	-0.076
8 Communicational intensity	20,328	0.020	0.226	0.000	7.000	0.116	0.106	0.015	0.012	0.005
9 Geographical distance	20,328	1803.146	3,008.097	0.000	19,034,000	-0.026	-0.033	0.085	0.001	0.097
10 Same country	20,328	0.399	0.490	0.000	1.000	0.102	0.098	0.083	-0.081	0.174
11 Mutual likes	20,328	0.006	0.078	0.000	2.000	0.101	0.112	0.046	0.027	0.026
12 Gender similarity	20,328	0.810	0.392	0.000	1.000	0.009	0.008	-0.014	-0.009	-0.007
13 Evaluator's hierarchical position	264	4.727	1.622	1.000	8.000	0.015	0.002	-0.332	-0.819	0.427
14 Relevance for evaluator's division	20,328	0.652	0.476	0.000	1.000	0.022	0.018	-0.023	0.024	-0.050
15 Share funded	20,328	0.150	0.260	0.000	1.000	0.089	0.077	-0.055	-0.036	-0.028
Variable	6	7	8	9	10	11	12	13	14	15
1 Idea selection										
2 Funding amount										
3 Hierarchical similarity										
4 Hierarchical similarity upward										
5 Hierarchical similarity downward	1.000									
6 Lateral closeness										
7 Idea novelty	0.041	1.000								
8 Communicational intensity	0.011	-0.013	1.000							



TABLE 2 (Continued)

	6	7	8	9	10	11	12	13	14	15
9	Geographical distance	-0.044	-0.091	-0.011	1.000					
10	Same country	0.043	0.133	0.018	-0.441	1.000				
11	Mutual likes	0.065	0.001	0.178	-0.020	0.048	1.000			
12	Gender similarity	0.065	-0.004	0.010	-0.006	-0.049	-0.007	1.000		
13	Evaluator's hierarchical position	0.043	0.000	-0.016	-0.047	0.037	0.058	1.000		
14	Relevance for evaluator's division	0.009	-0.073	0.019	-0.044	-0.040	0.030	0.030	1.000	
15	Share funded	-0.019	-0.202	0.005	-0.101	0.057	-0.005	0.018	0.078	1.000

TABLE 3 Main findings

	Model 1			Model 2			Model 3			Model 4		
	Logit	SE	P	Logit	SE	P	Fractional logit	SE	P	Tobit	SE	P
Constant	-3.941	1.304	.003	-3.857	1.295	.003	-23.468	2.134	.000	-18,590.310	4,822,359.000	.997
Hierarchical similarity	0.279	0.053	.000				0.254	0.063	.000	316.979	64.573	.000
Hierarchical similarity upward				0.258	0.063	.000						
Hierarchical similarity downward				0.300	0.067	.000						
Hierarchical similarity × lateral closeness												
Hierarchical similarity × idea novelty												
Lateral closeness	1.232	0.142	.000	1.232	0.142	.000	1.273	0.185	.000	1,485.462	180.996	.000
Communicational intensity	0.847	0.099	.000	0.847	0.099	.000	0.543	0.101	.000	1,132.875	133.752	.000
Geographical distance	0.000	0.000	.000	0.000	0.000	.000	0.000	0.000	.049	0.195	0.037	.000
Same country	1.568	0.161	.000	1.568	0.161	.000	1.629	0.225	.000	1,632.964	189.303	.000
Mutual likes	1.000	0.274	.000	1.000	0.274	.000	1.003	0.252	.000	1,677.254	384.666	.000
Gender similarity	0.220	0.160	.168	0.220	0.160	.168	0.351	0.350	.316	355.436	196.120	.070
Evaluator's hierarchical position	0.021	0.038	.576				-0.086	0.044	.048	15.828	44.656	.723
Idea relevance for evaluator's division	0.321	0.239	.180	0.321	0.239	.180	-0.104	0.509	.838	313.338	267.642	.242
Share funded	4.610	0.700	.000	4.610	0.700	.000	4.234	1.041	.000	5,803.335	911.331	.000
Share funded squared	-5.081	0.755	.000	-5.081	0.755	.000	-5.497	1.089	.000	-6,615.496	974.504	.000
Mills ratio	-2.468	1.763	.162	-2.468	1.763	.162	0.334	2.724	.902	-3,800.370	2,368.029	.109
Idea fixed effects	Yes			Yes			Yes			Yes		
N	15,312.000			15,312.000			17,952.000			17,952.000		
II	-1,669.502			-1,669.502			-123.307			-5,699.230		



TABLE 3 (Continued)

	Model 5			Model 6			Model 7					
	OLS	<i>b</i>	<i>SE</i>	<i>p</i>	Logit	<i>b</i>	<i>SE</i>	<i>p</i>	Logit	<i>b</i>	<i>SE</i>	<i>p</i>
Constant	78.435		64.404	.223	-3.656		1.316	.005	-3.821		1.312	.004
Hierarchical similarity	10.201		1.971	.000	0.355		0.057	.000	-3.469		1.243	.005
Hierarchical similarity upward												
Hierarchical similarity downward												
Hierarchical similarity × lateral closeness					-0.506		0.114	.000				
Hierarchical similarity × idea novelty												
Lateral closeness	65.124		6.189	.000	0.918		0.157	.000	4.456		1.481	.003
Communicational intensity	113.050		9.341	.000	0.865		0.100	.000	0.844		0.099	.000
Geographical distance	0.006		0.001	.000	0.000		0.000	.000	0.000		0.000	.000
Same country	55.689		5.806	.000	1.600		0.163	.000	1.580		0.161	.000
Mutual likes	340.135		27.732	.000	1.035		0.272	.000	1.004		0.273	.000
Gender similarity	9.946		6.134	.105	0.233		0.160	.147	0.226		0.160	.158
Evaluator's hierarchical position	2.508		1.425	.078	0.009		0.039	.814	-0.014		0.040	.724
Idea relevance for evaluator's division	-2.460		8.042	.760	0.306		0.238	.199	0.331		0.239	.166
Share funded	218.151		36.980	.000	4.468		0.700	.000	4.574		0.699	.000
Share funded squared	-295.545		38.603	.000	-5.024		0.755	.000	-5.051		0.753	.000
Mills ratio	-206.623		88.596	.020	-2.623		1.776	.140	-2.379		1.775	.180
Idea fixed effects	Yes				Yes				Yes			
N	17,952.000				15,312.000				15,312.000			
II	-126,409.100				-1,659.972				-1,665.002			

an evaluator if they are co-located in the same country or have previously interacted on the platform. These three control variables support the notion that evaluators are more likely to fund ideators with whom they have a personal relationship. The fourth variable, *Geographical distance*, is not in line with this interpretation—individuals evaluate ideas better when the ideator is geographically more distant. However, this may be a suppression effect, since geographical distance's effect becomes much weaker when the other control variables for personal relationships were not included in the regression. In all, we are confident that these different variables act as indicators to control for the likelihood that ideators and evaluators have personal relationships with one another.

To strengthen our findings on our main effect proposed in H1, we conduct three further analyses. First, we check whether the hierarchical similarity effect differs depending on whether evaluators assessed ideas from ideators above or below them. The effects of upward hierarchical similarity and downward hierarchical similarity are both positive (see Model 2 in Table 3), there being no difference between the coefficients ( $p = .576$ ).

Second, we check whether our findings hold when we consider that evaluators not only selected projects, but also assigned money to them. To do so, we use three models. We replicate our model with a fractional outcome (*Fraction funded*) capturing the share of funding awarded in relation to the requested funding (ranging between 0 and 1) (see Criscuolo et al., 2017). *Hierarchical similarity*'s effect remains the same (see Model 3 in Table 3). We also replicate our model using *idea evaluation* as the dependent variable, which captures the total amount an evaluator allocated to a given idea; it ranged between €0 and €3,160 in €1 increments. We use a tobit specification and our findings hold (*Hierarchical similarity* coefficient = 316.979,  $p = .000$ ) (see Model 4) as well as with an OLS specification (*Hierarchical similarity* coefficient = 10.201,  $p = .000$ ) (see Model 5).

Third, we rule out the possibility that hierarchical similarity bias is an artifact of the distribution the hierarchical positions of the ideators and the evaluators. For instance, if there were a concentration of high-quality ideas on one hierarchical level of ideators and there were also many evaluators on that level, the relationship between *Hierarchical similarity* and *Idea selection* may be overestimated. To rule out this possibility, we perform three checks: First, we randomly reassign the investments to evaluators, leaving unchanged the data on the personal characteristics of the evaluators and the ideators, especially their hierarchical positions. If our results are only an artifact of the distribution of the dyads, we would find the hierarchical similarity bias, despite the random reallocation of investments; this is not the case. The resulting regression analysis does not replicate the relationship between *Hierarchical similarity* and *Idea selection* (coefficient = 0.025,  $p = .553$ ). As a second check, we control for evaluators' hierarchical levels using dummies. This specification helps absorb all hierarchy-specific effects and accounts for potential confounders rooted in hierarchy. Our findings remain robust to this specification (coefficient = 0.368,  $p = .000$ ). In a third check, we use evaluator-fixed effects to absorb all evaluator-level variance; our findings also remained robust to this specification (coefficient = 0.359,  $p = .000$ ).

## 5.2 | H2: The moderating effect of lateral closeness

To test H2, we check whether *Lateral closeness* moderates the relationship between *Hierarchical similarity* and *Idea selection*. We use the same model as for testing H1, but add the interaction between *Hierarchical similarity* and *Lateral closeness*. As shown in Model 6 (Table 3), the positive relationship between *Hierarchical similarity* and *Idea selection* is stronger for more laterally

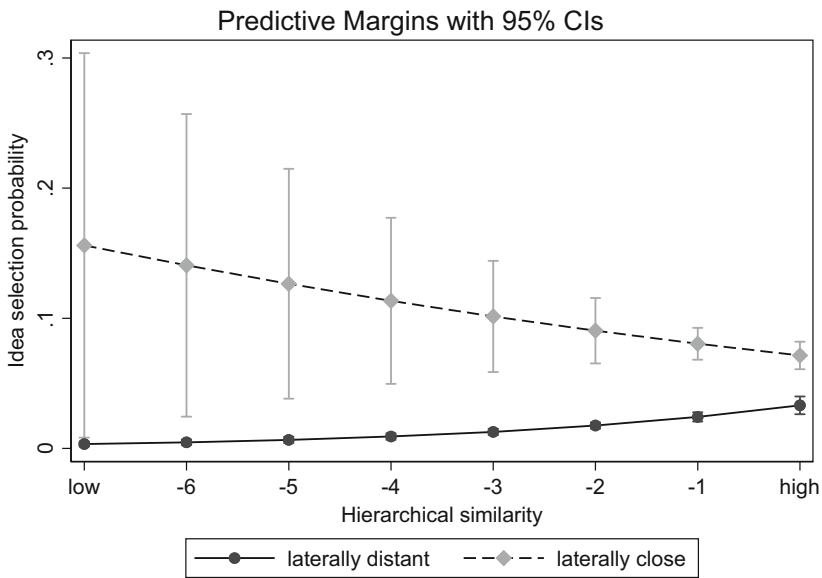


FIGURE 1 Effects of hierarchical similarity for laterally close versus distant evaluations.

distant evaluations (interaction effect: coefficient =  $-0.506$ ,  $p = .000$ ). *Hierarchical similarity's* effect is strong and positive for distant evaluations (coefficient =  $0.007$ ,  $p = .000$ ), and very weakly negative for close evaluations (coefficient =  $-0.010$ ,  $p = .214$ ). (See also Figure 1, which shows marginal effects; *Lateral closeness* is depicted as 1 = close and 0 = distant.) In other words, *Hierarchical similarity* produces a positive evaluation bias for distant evaluations, but this bias disappears for close evaluations.

As an ancillary analysis, we examine this interaction from the perspective of Reitzig and Sorenson's (2013) paper, that is, we check whether favoritism among employees from the same business unit is reduced by hierarchical parity. Our earlier contention was that laterally distant evaluations are favorable at similar hierarchical levels, since hierarchical homophily will be the dominant mechanism. In contrast, if ideators are laterally close to evaluators, we theorized that hierarchical similarity is likely associated with less favorable evaluations, since hierarchical similarity combined with lateral closeness engenders rivalry. Thus, evaluators should prefer ideas from the same unit if idea evaluators and creators are at different hierarchical levels. However, if idea evaluators and creators are hierarchical peers, evaluators should prefer ideas from a different unit.

To explore this conjecture, we dichotomized hierarchical similarity into hierarchically similar (same hierarchical level) and hierarchically distant (different hierarchical level) (Hwang et al., 2015).<sup>3</sup> Then, using the same specification as in the main analysis, we test the interaction between lateral and hierarchical proximity and find that the effect prevails. A more detailed inspection (for an interaction plot, see Figure 2) reveals three things. First, the effect of *Hierarchical similarity* (*dichotomous*) is positive for laterally distant evaluations (coefficient =  $0.007$ ,  $p = .043$ ) and weakly negative for close evaluations (coefficient =  $-0.020$ ,  $p = .085$ ). Second, the effect of *Lateral closeness* is always positive, but is weaker for ideas from creators at

<sup>3</sup>Hwang et al. (2015) labeled this measure *status similarity*. We label it *hierarchical similarity*, since status can be based on a number of other categories, such as education, race, gender (Magee & Galinsky, 2008), or performance outcomes (Piezunka et al., 2018a).

the same hierarchical level (coefficient = 0.049,  $p = .000$ ) than for creators from different hierarchical levels (coefficient = 0.076,  $p = .000$ ). Third, contrast analysis indicates that, compared to different-level evaluation, idea evaluation is more positive for same-level evaluation outside the unit (contrast = 0.007,  $p = .043$ ), but weakly negative for same-level evaluation within the unit (contrast =  $-0.020$ ,  $p = .085$ ).

In sum, these analyses confirm that structural similarity relates positively to idea selection for low structural similarity values, but that the effect becomes less strong and potentially even negative at some point.

### 5.3 | H3: The moderating effect of idea novelty

To test H3, we investigate whether the degree of idea novelty moderates the relationship between *Hierarchical similarity* and *Lateral closeness*. To this end, we use the same model as above, fixing the idea variance. Thus, the main effect of novelty is not included in the regressions (the effect is weakly negative when we used random-effects models). Instead, we include *idea novelty* as a moderator on the relationship between *Hierarchical similarity* and *Idea selection*. We use the same control variables set as in the main analysis.

As shown in Model 7 in Table 3, the positive relationship between *Hierarchical similarity* and *Idea selection* is stronger for more novel ideas (interaction term coefficient = 4.456,  $p = .003$ ). *Hierarchical similarity*'s effect is positive for nonnovel ideas (coefficient = 0.004,  $p = .007$ ), but larger for novel ideas (coefficient = 0.011,  $p = .000$ ). (See also Figure 3; novelty is depicted at  $\pm 1$  SD.) This indicates that the positive evaluation bias produced by *Hierarchical similarity* is stronger for more novel ideas.

### 5.4 | Mechanism analysis

We will now build support for our argument that hierarchy-based homophily is the underlying process that leads evaluators to overvalue hierarchically similar others' ideas. First, we will rule

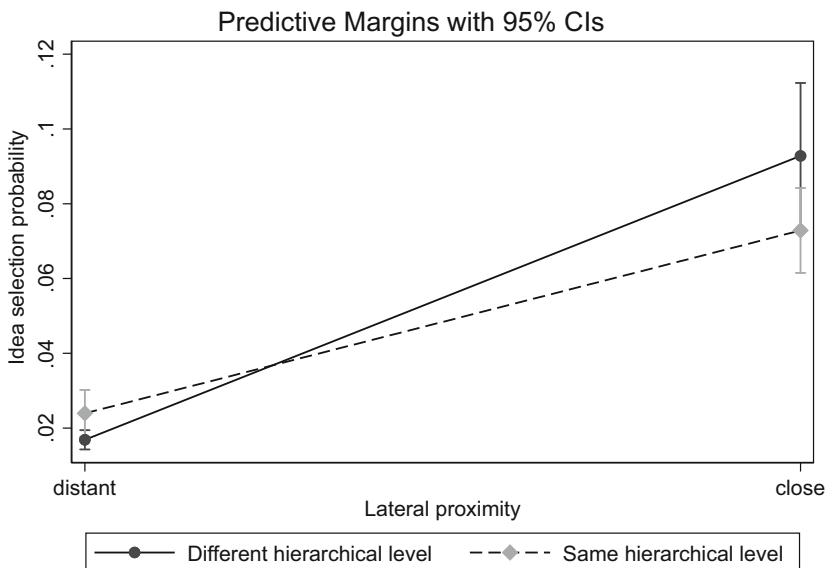


FIGURE 2 Effects of lateral similarity for hierarchically close versus distant evaluations.

out two other potential pathways: one, that evaluators like hierarchically close others' idea content better (the informational pathway) (Section 5.4.1); two, that people in similar hierarchical positions are more likely to interact and thus prefer one another's ideas (the relational pathway) (Section 5.4.2). We will then show experimental support for our suggested—structural (rather than the informational or the relational)—pathway (Section 5.4.3).

### 5.4.1 | Ruling out the informational pathway

First, we need to rule out information as the principal mechanism underlying our findings, specifically the notion that preferential evaluation of hierarchical peers is due to aspects of the presented idea content: idea evaluators could prefer ideas from hierarchically close others, simply because these involve topics that are particularly important at a specific hierarchical level.

Our analyses counter this explanation in two ways. First, our models used idea-level fixed effects. Thus, the hierarchical similarity bias we observed is not rooted in the information provided (i.e., the ideas). Second, we exploit a part of our data set in which the ideators remained anonymous owing to their country's privacy laws (see Table 4). Evaluators were therefore blind to these ideators' identities as well as their positions in the organization. This data set included 9 ideas and 2,376 evaluator-creator pairs, which we had excluded from the main analysis. To check our contention about hierarchy-based social evaluations of ideas, we look for hierarchy effects in this anonymous sample. To this end, we add the interaction effect between *Hierarchical similarity* and the observability of the hierarchical position: The interaction (coefficient =  $-0.425$ ,  $p = .001$ ) shows that hierarchical similarity's effect is present for non-anonymous ideas (coefficient =  $0.287$ ,  $p = .000$ ), but not for the anonymous sample (coefficient =  $-0.138$ ,  $p = .61$ ). This strongly supports our contention that evaluations are affected by social cues; conversely, it rules out any alternative explanation that is based on idea content.

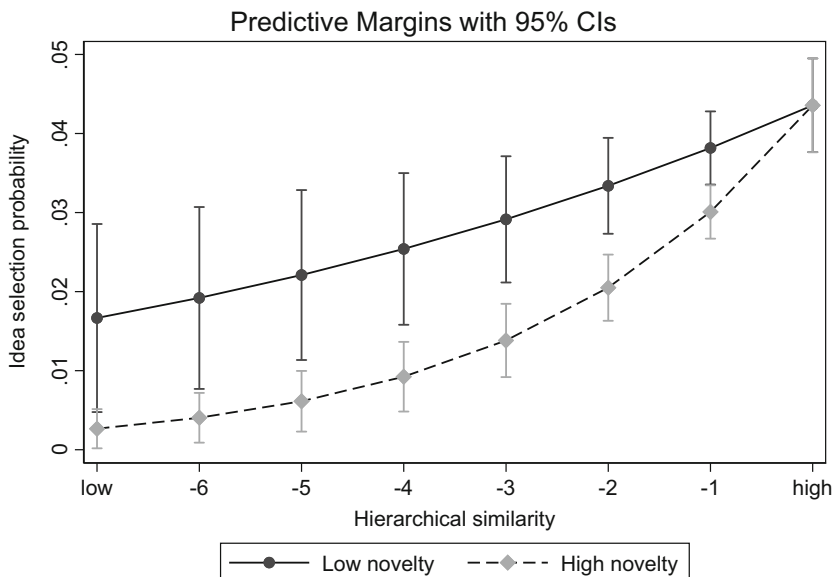


FIGURE 3 Effects of hierarchical similarity for high-novelty and low-novelty ideas

TABLE 4 Ruling out the informational pathway (anonymous sample included).

	Model		
	Logit		
	<i>b</i>	<i>SE</i>	<i>p</i>
Constant	−4.215	1.246	.001
Hierarchical similarity	0.287	0.052	.000
Idea creator anonymous	0.695	0.536	.194
Hierarchical similarity × idea creator anonymous	−0.425	0.128	.001
Lateral closeness	1.190	0.132	.000
Communicational intensity	0.839	0.095	.000
Geographical distance	0.000	0.000	.000
Same country	1.747	0.149	.000
Mutual likes	0.973	0.263	.000
Gender similarity	0.176	0.149	.237
Evaluator's hierarchical position	−0.001	0.037	.982
Idea relevance for evaluator's division	0.537	0.221	.015
Share funded	4.633	0.666	.000
Share funded squared	−5.188	0.717	.000
Mills ratio	−2.135	1.675	.203
Idea fixed effects	Yes		
<i>N</i>	17,424.000		
<i>ll</i>	−1884.273		

#### 5.4.2 | Ruling out the relational pathway

Here, we consider the possibility that hierarchical similarity leads to favoritism because people in similar hierarchical positions are more likely to interact or engage in reciprocal behavior (Aadland, Cattani, Falchetti, & Ferriani, 2020). Several patterns in the data contradict this explanation.

First, the support for H2 speaks against a purely relational explanation for our findings. If the relationship between hierarchical similarity and favorable idea evaluation were only driven by the relationships between employees, we would expect hierarchical similarity's effect to be stronger for more proximate peers. Instead, the hierarchical similarity bias is weaker for those who are laterally proximate. Similarly, the positive effect on evaluating others within the same unit is weaker if the idea creator and the idea evaluator are on the same hierarchical level. Second, our control variables set mitigates the concern that our findings are chiefly relational: even after accounting for variables that capture relationships such as *Communication intensity* and being in the *Same country*, hierarchical similarity's effect remains intact.

Further, we examine whether our findings are driven by relational mechanisms in the form of reciprocal behavior. Although ideators never learnt the sources of their funding, and we have already controlled for reciprocal likes, we further check whether our findings are affected by evaluators who are ideators themselves (for the results, see Table 5). Only for these



TABLE 5 Ruling out the relational pathway—controlling for reciprocity

	Model		
	Logit		
	<i>b</i>	<i>SE</i>	<i>p</i>
Constant	−4.644	1.352	.001
Hierarchical similarity	0.283	0.055	.000
Evaluator is also idea creator	−0.432	0.192	.030
Hierarchical similarity × evaluator is also idea creator	−0.038	0.116	.746
Lateral closeness	1.246	0.143	.000
Communicational intensity	0.865	0.101	.000
Geographical distance	0.000	0.000	.000
Same country	1.574	0.162	.000
Mutual likes	1.299	0.305	.000
Gender similarity	0.219	0.161	.173
Evaluator's hierarchical position	0.019	0.038	.611
Idea relevance for evaluator's division	0.322	0.237	.174
Share funded	4.584	0.700	.000
Share funded squared	−5.077	0.754	.000
Mills ratio	−1.373	1.842	.456
Idea fixed effects	Yes		
<i>N</i>	15,312.000		
<i>ll</i>	−1,666.418		

35 individuals would it be possible to engage in reciprocal behavior in the form of mutually promoting each other's ideas. If reciprocal behavior drove our findings, our *Hierarchical similarity* effect should have disappeared for individuals who did not provide ideas themselves. However, the interaction effect shows no differences between the two groups (coefficient = −0.038,  $p = .746$ ), indicating that *Hierarchical similarity's* effects are positive for both non-ideators (coefficient = 0.283,  $p = .000$ ) and ideators (coefficient = 0.245,  $p = .035$ ).

Further, we consider the possibility that individuals from similar hierarchical levels are more likely to engage in funding coalitions. In this case, we would expect them to fund projects early on, to fulfill their coalition obligation, or later, in case the funding limit is not met and additional funding is required. Thus, we check whether hierarchical similarity is associated with receiving funding earlier or later in time. We test this idea by regressing minutes after the contest started on the same variable specification as in the main tests, using a reduced dataset that only included the funded projects. We found no relationship between hierarchical distance and time of evaluation (coefficient = 74.288,  $p = .226$ ).

Finally, we added a control variable that captured to what extent individuals were more likely to reciprocate funding they had received from another employee. We find that individuals were indeed more likely to reciprocate (coefficient = 1.127,  $p = .017$ ), but *Hierarchical similarity's* effect remains almost equal in size as in our original specification (coefficient = 0.276,  $p = .000$ ).

In sum, even if we cannot rule out that relational pathways coexist with our proposed mechanism, none of these analyses challenge hierarchy-based homophily as a pathway.

### 5.4.3 | Experimental support for the structural pathway

For our final analysis, we designed a scenario-based online experiment to (a) replicate our field data, (b) investigate the causality of the observed main effect in a controlled environment, and (c) test our proposed structural mediating mechanism.

We asked 248 participants from Prolific to imagine a hypothetical bike lock firm. Between subjects, our participants were randomly assigned to one of three hierarchical levels (hierarchical position: top vs. medium vs. low level) and were shown their position in an organizational chart (for a similar approach, see Keum & See, 2017). Within subjects, we then presented three ideas to the participants and asked them to read and evaluate each idea, which yielded 744 observations.

First, we sought to replicate our field study's main effect, using evaluator fixed effects and evaluator-clustered standard errors and fixed effects for the ideas, the evaluation order, and the creator's hierarchical level. *Hierarchical similarity* positively affected *Idea selection* ( $F(7, 247) = 6.12, b = 0.154, p = .036$ ), fully replicating H1 from the field study.

Next, we sought to unpack whether *Hierarchy-based homophily* is the mechanism that drives our findings. To explore the mediating process, participants again saw the last idea they had rated and answered our measure of *Hierarchy-based homophily*, using an adapted scale (see Greenberg & Mollick, 2017). Since we only measured *Hierarchy-based homophily* for the most recently rated idea, our analysis is based on a reduced data set ( $n = 248$ ). We applied Hayes's (2018) PROCESS procedure (Model 4) with 5,000 bootstrap iterations to test the indirect effect, controlling for both the idea and the evaluatee's hierarchy level. Mediation is present when the 95% confidence interval of the indirect effects excludes 0. In line with this, we find an indirect positive effect of *Hierarchical similarity* on *Idea selection* via *Hierarchy-based homophily* ( $b = 0.260, SE = 0.079, 95\% CI [0.122; 0.431]$ ). In sum, these experimental results strongly support our theory that *Hierarchical similarity* affects *Idea selection* via *Hierarchy-based homophily*.

## 6 | DISCUSSION AND CONCLUSION

### 6.1 | Theoretical contributions

#### 6.1.1 | Decision biases in centralized versus distributed innovation

We contribute to the conversation about biases rooted in the organization of innovation (Colombo et al., 2021; Keum & See, 2017), which uncovers idea evaluation biases both in centralized, hierarchical organizational types (Crisuolo et al., 2017; Hegde & Tumlinson, 2014) and in distributed, participative ones (Greenberg & Mollick, 2017; Reitzig & Sorenson, 2013). This research field seeks to explain the conditions in which each organizational form excels, the decision biases produced by each, and the optimal decision-making systems design.

Our first contribution is to show that distributed decision-making systems, whose key advantages purportedly derive from the absence of hierarchy, are in fact distorted by hierarchy. We have shown that, in decentralized idea evaluation systems such as internal crowdfunding,

biases may stem not only from a lack of formal hierarchical selection power, but—ironically—also from the shadow that hierarchy casts onto such systems. Hierarchy remains a strong source of identification and behavior in decentralized systems.

Second, we contribute to the literature by relating homophily to attributes of organizational structure, explaining *how* and *why* hierarchical similarity distorts distributed idea evaluation. Specifically, we put forward hierarchy-based homophily as the underlying process that leads evaluators to overvalue ideas of hierarchically similar others. Hierarchy-based homophily represents a source of identification: it elicits feelings of liking and “sharing the same fate” among hierarchical peers, based on the assumption of similar roles, pressures, and career trajectories in an organization. With growing hierarchical distance, homophilic preferences rooted in mutual identification and shared problems decline and turn into downward scorn and upward envy (Fiske, 2010). Our field study and experiment allowed us to identify this mechanism as the likely source of the bias, confirming that it is structural rather than informational or relational.

Third, concerning our second moderator, we have investigated the interplays between structural similarity biases and novelty (see also Criscuolo et al., 2017), showing an amplifying effect. Past research found that the reliance on social evaluation depends on the artifact under evaluation's quality: social evaluation is especially pronounced if the assumed *artifact quality* is low (Hegde & Tumlinson, 2014). Controlling for idea quality, we found that social evaluation also depends on *artifact novelty*, proposing uncertainty as the mechanism: greater idea novelty increases evaluation uncertainty (cf. Mueller et al., 2012), which makes an evaluation's social context more salient. Our insights bound the usefulness of distributed decision-making and indicate when hierarchical decision-making by experts may be more efficient.

### 6.1.2 | Structural similarity as a driver of employee behavior

Our research also speaks to the literature on how perceived structural similarity between individuals affect their organizational behavior. While some found that structural similarity elicits favorable evaluations and behaviors (Hwang et al., 2015; Reitzig & Sorenson, 2013), others found that it creates conflict (Kilduff et al., 2010; Piezunka et al., 2018b). Our results integrated these results by juxtaposing two competing latent processes: homophily and rivalry. Perceived structural similarity creates homophily and liking, but also competition and rivalry.

The prevalence of one over the other will depend on many circumstances that the literature yet needs to illuminate. We propose that future research should account for the multidimensionality of structural similarity, including aspects such as hierarchical position (this article), lateral position (e.g., Reitzig & Sorenson, 2013), tenure (e.g., Brennecke, 2020), function (e.g., Bunderson, 2003), or location (e.g., Hwang et al., 2015). The overall perception of structural similarity increases in the degree of similarity on each attribute as well as in the number and the salience of the attributes shared by individuals.

At low to intermediate levels of structural similarity, structural similarity positively affects evaluations of others' performance. This is reflected in our finding that hierarchical similarity is associated with favorable idea evaluation as long as the evaluator and the evaluatee are not in the same unit. This is also what others have observed for low to intermediate structural similarity levels, such as the positive relationship between horizontal distance and idea selection (Reitzig & Sorenson, 2013) and the positive relationship between status or location similarity and knowledge-sharing (Hwang et al., 2015).

At high levels of perceived structural similarity, rivalry outweighs homophily; thus, increases in structural similarity produce a negative net effect on evaluations of others. This is reflected in our findings that the evaluation of others' ideas is less favorable for hierarchically similar individuals who are also in the same business unit. Similarly, Piezunka et al. (2018a) showed, in the context of Formula 1 drivers, that being fully structurally equivalent produces "destructive conflict" (Piezunka et al., 2018a).

While we trust that these considerations may offer a useful integrating perspective on conflicting findings in the literature, more research is needed to build a fully integrated theory.

## 6.2 | Managerial implications

Managers are used to seeing hierarchy as a source of rivalry that can distort decision-making against hierarchical peers. We have highlighted that hierarchical similarity (like other types of structural similarity) can also have the opposite effect: it can elicit identification among peers that engenders favoritism. We will now consider how such biases created by structural similarity affect decision-making systems design, particularly the choice between centralized and distributed decision-making.

Our findings indicate that managers, when choosing between a more centralized and a more distributed decision-making design, should consider three conditions:

The first aspect to consider is structural identifiability, that is, whether the situation requires that the ideators' positions in the organization be known. In centralized decision-making, ideators' identities are typically known to the decision-making managers. Since all evaluations are top-down, homophily or competition are less likely to distort decision-making. In contrast, in distributed decision-making, which newly enables upward and peer evaluation of ideas by employees at large, structural similarity is likely to affect decision-making more broadly. This impact can be lessened by reducing the amount of structural information provided about ideators (e.g., organizational designers may consider anonymizing idea proposals during a contest, and only revealing names afterward).

The second condition that is likely to exacerbate structural biases in distributed decision-making is idea novelty. Since it is hard to assess highly novel ideas, these are more prone to hierarchy-based mental shortcuts and biases. This finding challenges the expectation that distributed decision-making systems are inherently better able to deal with breakthrough ideas (cf. Bernstein et al., 2016).

Third, low employee accountability levels may lower the quality of distributed decisions. Low accountability means that decision-makers do not face consequences for poor decision-making, which invites shirking and less careful decision-making. Our context was such a low-accountability setting, since idea evaluators remained anonymous throughout.

Under these three conditions—well-identified ideators in combination with novel ideas and/or unaccountable evaluators—distributed decision-making systems are especially likely to suffer from structural biases. While managers may still want to choose distributed decision-making systems over traditional ones—owing to countervailing benefits such as the division of work, the integration of many stakeholders' perspectives, and employee motivation—our results suggest that these conditions require particular care and some counteracting measures. Thus, our research lends support to the literature suggesting that these benefits need to be weighed against distortions that are newly introduced by distributed decision systems.



### 6.3 | Limitations and future research

Our study has limitations, which open avenues for future research. First, we cannot be certain how carefully the evaluators screened the ideas on the crowdfunding platform. Interviews among 22 evaluators after the crowdfunding initiative suggested that they diligently sought to identify the best ideas: they reported that they had “tried to really understand what the different projects are about” and had examined “the project plan, how [ideators] wanted to achieve it, whether it would make sense, whether it is reasonable, whether they could deliver according to the plan.”

Second, we investigated only one organization, a fairly hierarchical European manufacturing company. This could affect our findings' generalizability. On the one hand, in less hierarchically structured firms, it may be easier for employees to overcome biases rooted in organizational structure. On the other hand, it is remarkable that we found *hierarchical similarity* to *positively* affect idea evaluation, despite the fact that the organization was so strongly hierarchical.

Finally, it would be interesting to investigate whether the same bias exists in centralized, hierarchical decision systems. Even if, in such systems, employees are not formally responsible for selecting ideas of peers or superiors, they are often called on to provide assessments of others' ideas. We would expect that structural similarity biases also affect such settings. At the same time, this bias may take different shapes depending on the motivations and incentives, the degree of competition (see H2), and the accountability level for the support that is given or withheld.

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### DATA AVAILABILITY STATEMENT

Research data are not shared.

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